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ARITHMETIC APTITUDE NUMBERS

1. $1397 \times 1397 = ?$

Answer: 1951609.

Explanation:

$$\begin{aligned}
 1397 \times 1397 &= (1397)^2 \\
 &= (1400 - 3)^2 \\
 &= (1400)^2 + (3)^2 - (2 \times 1400 \times 3) \\
 &= 1960000 + 9 - 8400 \\
 &= 1960009 - 8400 \\
 &= 1951609.
 \end{aligned}$$

2. $(112 \times 5^4) = ?$

Answer: 70000

Explanation:

$$(112 \times 5^4) = 112 \times \frac{10^4}{2} = \frac{112 \times 10^4}{2^4} = \frac{1120000}{16} = 70000$$

3. It is being given that $(2^{32} + 1)$ is completely divisible by a whole number. Which of the following numbers is completely divisible by this number?

Answer: $(x + 1)$

Explanation:

Let $2^{32} = x$. Then, $(2^{32} + 1) = (x + 1)$.

Let $(x + 1)$ be completely divisible by the natural number N. Then,
 $(2^6 + 1) = [(2^{32})^3 + 1] = (x^3 + 1) = (x + 1)(x^2 - x + 1)$, which is completely divisible by N, since $(x + 1)$ is divisible by N.

4. Which one of the following is not a prime number?

Answer: 91

Explanation:

91 is divisible by 7. So, it is not a prime number.

5. What least number must be added to 1056, so that the sum is completely divisible by 23 ?

Answer: 2

Explanation:

23) 1056 (45

92

136

115

21

Required number = $(23 - 21)$
 $= 2.$

6. How many of the following numbers are divisible by 132 ?

264, 396, 462, 792, 968, 2178, 5184, 6336

Answer: 4

Explanation:

$$132 = 4 \times 3 \times 11$$

So, if the number divisible by all the three number 4, 3 and 11, then the number is divisible by 132 also.

264 11,3,4 (/)

396 11,3,4 (/)

462 11,3 (X)

792 11,3,4 (/)

968 11,4 (X)

2178 11,3 (X)

5184 3,4 (X)

6336 11,3,4 (/)

Therefore the following numbers are divisible by 132 : 264, 396, 792 and 6336.

Required number of number = 4.

$$7.(935421 \times 625) = ?$$

Answer: 584638125

Explanation:

$$\begin{aligned} 935421 \times 625 &= 935421 \times 5^4 = 935421 \times \\ &\quad \begin{array}{r} 10 \\ 2 \end{array} \quad \begin{array}{r} 4 \\ 2 \end{array} \\ &= \frac{935421 \times 10^4}{2^4} = \frac{9354210000}{16} \\ &= 584638125 \end{aligned}$$

8. The largest 4 digit number exactly divisible by 88 is:

Answer: 9944

Explanation:

Largest 4-digit number = 9999

88) 9999 (113

88

119

88

319

264

55

$$\begin{aligned} \text{Required number} &= (9999 - 55) \\ &= 9944. \end{aligned}$$

9. On dividing a number by 5, we get 3 as remainder. What will the remainder when the square of this number is divided by 5 ?

Answer: 4

Explanation:

Let the number be x and on dividing x by 5, we get k as quotient and 3 as remainder.

$$x = 5k + 3$$

$$\begin{aligned} x^2 &= (5k + 3)^2 \\ &= (25k^2 + 30k + 9) \\ &= 5(5k^2 + 6k + 1) + 4 \end{aligned}$$

On dividing x^2 by 5, we get 4 as remainder.

10. How many of the following numbers are divisible by 3 but not by 9 ?

2133, 2343, 3474, 4131, 5286, 5340, 6336, 7347, 8115, 9276

Answer: 6

Explanation:

Marking (/) those which are divisible by 3 but not by 9 and the others by (X), by taking the sum of digits, we get:

2133 9 (X)

2343 12 (/)

3474 18 (X)

4131 9 (X)

5286 21 (/)

5340 12 (/)

6336 18 (X)

7347 21 (/)

8115 15 (/)

9276 24 (/)

Required number of numbers = 6.

11. $(x^n - a^n)$ is completely divisible by $(x - a)$, when

Answer: For every natural number n , $(x^n - a^n)$ is completely divisible by $(x - a)$.

Explanation:

For every natural number n , $(x^n - a^n)$ is completely divisible by $(x - a)$.

12. A 3-digit number $4a3$ is added to another 3-digit number 984 to give a 4-digit number $13b7$, which is divisible by 11. Then, $(a + b) = ?$

Answer: 10

Explanation:

$$\begin{array}{r} 4 \ a \ 3 \\ | \\ 9 \ 8 \ 4 \\ \} \implies a + 8 = b \implies b - a = 8 \\ 13 \ b \ 7 \ | \end{array}$$

Also, $13b7$ is divisible by 11

$$(7 + 3) - (b + 1) = (9 - b)$$

$$(9 - b) = 0$$

$$b = 9$$

$$(b = 9 \text{ and } a = 1) \quad (a + b) = 10.$$

13. Which one of the following is the common factor of $(47^{43} + 43^{43})$ and $(47^{47} + 43^{47})$?

Answer: $(47 + 43)$.

Explanation:

When n is odd, $(x^n + a^n)$ is always divisible by $(x + a)$.

Each one of $(47^{43} + 43^{43})$ and $(47^{47} + 43^{47})$ is divisible by $(47 + 43)$.

$$14. (963 + 476)^2 + (963 - 476)^2 = ? \\ (963 \times 963 + 476 \times 476)$$

Answer: 2

Explanation:

$$\text{Given Exp.} = \frac{(a + b)^2 + (a - b)^2}{(a^2 + b^2)} = \frac{2(a^2 + b^2)}{(a^2 + b^2)} = 2$$

$$15. 8597 - ? = 7429 - 4358$$

Answer: 5526

Explanation:

$$7429 \quad \text{Let } 8597 - x = 3071$$

$$-4358 \quad \text{Then, } x = 8597 - 3071 \\ \hline \quad \quad \quad = 5526$$

$$3071 \\ \hline$$

$$16. (12345679 \times 72) = ?$$

Answer: 888888888

Explanation:

$$\begin{aligned} 12345679 \times 72 &= 12345679 \times (70 + 2) \\ &= 12345679 \times 70 + 12345679 \times 2 \\ &= 864197530 + 24691358 \\ &= 888888888 \end{aligned}$$

17. What smallest number should be added to 4456 so that the sum is completely divisible by 6?

Answer: 2

Explanation:

$$\begin{array}{r} 6) 4456 (742 \\ 42 \\ \hline 16 \\ 12 \\ \hline 4 \end{array}$$

24 Therefore, Required number = $(6 - 4) = 2$.

$$\hline$$

$$16$$

$$12$$

$$\hline$$

$$4$$

18. Which of the following numbers will completely divide $(49^{15} - 1)$?

Answer: 8

Explanation:

$(x^n - 1)$ will be divisible by $(x + 1)$ only when n is even.

$(49^{15} - 1) = \{(7^2)^{15} - 1\} = (7^{30} - 1)$, which is divisible by $(7 + 1)$, i.e., 8.

$$19. (11^2 + 12^2 + 13^2 + \dots + 20^2) = ?$$

Answer: 2485

Explanation:

$$(11^2 + 12^2 + 13^2 + \dots + 20^2) = (1^2 + 2^2 + 3^2 + \dots + 20^2) - (1^2 + 2^2 + 3^2 + \dots + 10^2)$$

Ref: $(1^2 + 2^2 + 3^2 + \dots + n^2) = \frac{1}{6}n(n+1)(2n+1)$

$$\begin{aligned} & 20 \times 21 \times 41 \quad 10 \times 11 \times 21 \\ = & \quad \quad \quad 6 \quad \quad \quad 6 \\ = & (2870 - 385) \\ = & 2485. \end{aligned}$$

$$20.(51+52+53+\dots+100) = ?$$

Answer: 3775

Explanation:

This is an A.P. in which $a = 51$, $l = 100$ and $n = 50$.

$$\begin{aligned} \text{Sum} &= \frac{n}{2} (a+l) = \frac{50}{2} \times (51+100) = (25 \times 151) = 3775. \\ 21. \quad 1 - \frac{1}{n} &+ 1 - \frac{2}{n} + 1 - \frac{3}{n} + \dots \text{ up to } n \text{ terms} = ? \end{aligned}$$

Answer: $\frac{1}{2}(n-1)$

Explanation:

Given sum = $(1 + 1 + 1 + \dots \text{ to } n \text{ terms}) - \frac{1}{n} - \frac{2}{n} - \frac{3}{n} - \dots \text{ to } n \text{ terms}$

$$\begin{aligned} &= n - \frac{n}{2} - \frac{1}{n} + 1 \quad [\text{Ref: } n\text{th terms} = (n/n) = 1] \\ &= n - \frac{n+1}{2} \\ &= (n-1)/2 \end{aligned}$$

22. Which natural number is nearest to 8485, which is completely divisible by 75?

Answer: 8475

Explanation:

On dividing, we get

75) 8485 (113

75

98

75

235

225

10

Required number = $(8485 - 10)$

$$= 8475.$$

23. A boy multiplied 987 by a certain number and obtained 559981 as his answer. If in the answer both 98 are wrong and the other digits are correct, then the correct answer would be:

Answer: 555681

Explanation:

$$987 = 3 \times 7 \times 47$$

So, the required number must be divisible by each one of 3, 7, 47

553681 (Sum of digits = 28, not divisible by 3)

555181 (Sum of digits = 25, not divisible by 3)

555681 is divisible by 3, 7, 47.

24. On dividing 2272 as well as 875 by 3-digit number N, we get the same remainder. The sum of the digits of N is:

Answer: 10

Explanation:

Clearly, $(2272 - 875) = 1397$, is exactly divisible by N.

$$\text{Now, } 1397 = 11 \times 127$$

The required 3-digit number is 127, the sum of whose digits is 10.

25. How many prime numbers are less than 50?

Answer: 15

Explanation:

Prime numbers less than 50 are:

2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47

Their number is 15

26. In a division sum, the divisor is 10 times the quotient and 5 times the remainder. If the remainder is 46, what is the dividend?

Answer: 5336

Explanation:

$$\text{Divisor} = (5 \times 46) = 230$$

$$\begin{array}{r} 230 \\ 10 \times \text{Quotient} = 230 \\ \hline = 10 = 23 \end{array}$$

$$\text{Dividend} = (\text{Divisor} \times \text{Quotient}) + \text{Remainder}$$

$$= (230 \times 23) + 46$$

$$= 5290 + 46$$

$$= 5336.$$

27. n is a whole number which when divided by 4 gives 3 as remainder. What will be the remainder when $2n$ is divided by 4?

Answer: 2

Explanation:

Let $n = 4q + 3$. Then $2n = 8q + 6 = 4(2q + 1) + 2$.

Thus, when $2n$ is divided by 4, the remainder is 2.

28.The sum of the two numbers is 12 and their product is 35. What is the sum of the reciprocals of these numbers ?

Answer: 12/35

Explanation:

Let the numbers be a and b . Then, $a + b = 12$ and $ab = 35$.

$$\begin{array}{rcl} a+b & 12 \\ ab & \overline{35} & \\ & b+a & = 35 \\ & & 12 \end{array}$$

Sum of reciprocals of given numbers =35

$29.5358 \times 51 = ?$

Answer: 273258

Explanation:

$$\begin{aligned} 5358 \times 51 &= 5358 \times (50 + 1) \\ &= 5358 \times 50 + 5358 \times 1 \\ &= 267900 + 5358 \\ &= 273258. \end{aligned}$$

30.The sum of first five prime numbers is:

Answer: 28

Explanation:

Required sum = $(2 + 3 + 5 + 7 + 11) = 28$.

Note: 1 is not a prime number.

Definition: A prime number (or a prime) is a natural number that has exactly two distinct natural number divisors: 1 and itself.

31.The difference of two numbers is 1365. On dividing the larger number by the smaller, we get 6 as quotient and the 15 as remainder. What is the smaller number ?

Answer: 270

Explanation:

Let the smaller number be x . Then larger number = $(x + 1365)$.

$$x + 1365 = 6x + 15$$

$$5x = 1350$$

$$x = 270$$

Smaller number = 270.

32.If the number $517 * 324$ is completely divisible by 3, then the smallest whole number in the place of $*$ will be:

Answer: 2

Explanation:

Sum of digits = $(5 + 1 + 7 + x + 3 + 2 + 4) = (22 + x)$, which must be divisible by 3.

$$x = 2.$$

$$33.72519 \times 9999 = ?$$

Answer: 725117481

Explanation:

$$\begin{aligned} 72519 \times 9999 &= 72519 \times (10000 - 1) \\ &= 72519 \times 10000 - 72519 \times 1 \\ &= 725190000 - 72519 \\ &= 725117481. \end{aligned}$$

$$34. (12)^3 \times 6^4 \div 432 = ?$$

Answer: 5184

Explanation:

$$\text{Given Exp. } = \frac{(12)^3 \times 6^4}{432} = \frac{(12)^3 \times 6^4}{12 \times 6^2} = (12)^2 \times 6^2 = (72)^2 = 5184$$

35.The smallest 3 digit prime number is:

A.103

B. 107

C.109

D.113

E. None of these

Answer: None of these

Explanation:

The smallest 3-digit number is 100, which is divisible by 2.

100 is not a prime number.

$\sqrt{101} < 11$ and 101 is not divisible by any of the prime numbers 2, 3, 5, 7, 11.

101 is a prime number.

Hence 101 is the smallest 3-digit prime number.

36.Which one of the following numbers is exactly divisible by 11?

A.235641

B. 245642

C.315624

D.415624

Answer: 415624

Explanation:

$(4 + 5 + 2) - (1 + 6 + 3) = 1$, not divisible by 11.

$(2 + 6 + 4) - (4 + 5 + 2) = 1$, not divisible by 11.

$(4 + 6 + 1) - (2 + 5 + 3) = 1$, not divisible by 11.

$(4 + 6 + 1) - (2 + 5 + 4) = 0$, So, 415624 is divisible by 11.

$$37.(?) - 19657 - 33994 = 9999$$

Answer: 63650

Explanation:

- 19657 Let $x - 53651 = 9999$
 33994 Then, $x = 9999 + 53651 = 63650$

 53651

38. The sum of first 45 natural numbers is:

Answer: 1035

Explanation:

Let $S_n = (1 + 2 + 3 + \dots + 45)$. This is an A.P. in which $a = 1$, $d = 1$, $n = 45$.

$$S_n = \frac{n}{2}[2a + (n-1)d] = \frac{45}{2} [2 \times 1 + (45-1) \times 1] = \frac{45}{2} \times 46 = (45 \times 23)$$

$$= 45 \times (20 + 3)$$

$$= 45 \times 20 + 45 \times 3$$

$$= 900 + 135$$

$$= 1035.$$

Shortcut Method:

$$S_n = \frac{n(n+1)}{2} = \frac{45(45+1)}{2} = 1035.$$

$$39. (?) + 3699 + 1985 - 2047 = 31111$$

Answer: 27474

Explanation:

$$x + 3699 + 1985 - 2047 = 31111$$

$$x + 3699 + 1985 = 31111 + 2047$$

$$x + 5684 = 33158$$

$$x = 33158 - 5684 = 27474.$$

$$40. \frac{753 \times 753 + 247 \times 247 - 753 \times 247}{753 \times 753 \times 753 + 247 \times 247 \times 247} = ?$$

Answer:

$$\frac{1}{1000}$$

1000

Explanation:

$$\text{Given Exp. } = \frac{(a^2 + b^2 - ab)}{(a^3 + b^3)} = \frac{1}{(a+b)} = \frac{1}{(753 + 247)} = \frac{1}{1000}$$

41. Which of the following number is divisible by 24?

A. 35718

B. 63810

C. 537804

D. 3125736

Answer: 3125736

Explanation:

24 = 3 x 8, where 3 and 8 co-prime.
 Clearly, 35718 is not divisible by 8, as 718 is not divisible by 8.
 Similarly, 63810 is not divisible by 8 and 537804 is not divisible by 8.
 Cibesuder oart (d).
 Sum of digits = (3 + 1 + 2 + 5 + 7 + 3 + 6) = 27, which is divisible by 3.
 Also, 736 is divisible by 8.

3125736 is divisible by (3 x 8), i.e., 24.

42. If the number 481 * 673 is completely divisible by 9, then the smallest whole number in place of * will be:

Answer: 7

Explanation:

Sum of digits = (4 + 8 + 1 + x + 6 + 7 + 3) = (29 + x), which must be divisible by 9.

$$x = 7.$$

43. The difference between the local value and the face value of 7 in the numeral 32675149 is

Answer: 69993

Explanation:

$$(\text{Local value of 7}) - (\text{Face value of 7}) = (70000 - 7) = 69993$$

44. The difference between a positive proper fraction and its reciprocal is $\frac{9}{20}$. The fraction is:

Answer: $\frac{4}{5}$

Explanation:

Let the required fraction be x . Then $\frac{1}{x} - x = \frac{9}{20}$

$$\frac{1 - x^2}{x} = \frac{9}{20}$$

$$20 - 20x^2 = 9x$$

$$20x^2 + 9x - 20 = 0$$

$$20x^2 + 25x - 16x - 20 = 0$$

$$5x(4x + 5) - 4(4x + 5) = 0$$

$$(4x + 5)(5x - 4) = 0$$

$$x = \frac{4}{5}$$

45. On dividing a number by 56, we get 29 as remainder. On dividing the same number by 8, what will be the remainder?

Answer: 5

Explanation:

No answer description available for this question.

46. If n is a natural number, then $(6n^2 + 6n)$ is always divisible by:

Answer: 6 and 12 both

Explanation:

$(6n^2 + 6n) = 6n(n + 1)$, which is always divisible by 6 and 12 both, since $n(n + 1)$ is always even.

47. $107 \times 107 + 93 \times 93 = ?$

Answer: 20098

Explanation:

$$\begin{aligned} 107 \times 107 + 93 \times 93 &= (107)^2 + (93)^2 \\ &= (100 + 7)^2 + (100 - 7)^2 \\ &= 2 \times [(100)^2 + 7^2] \quad [\text{Ref: } (a + b)^2 + (a - b)^2 = 2(a^2 + b^2)] \\ &= 20098 \end{aligned}$$

48. What will be remainder when $(67^{67} + 67)$ is divided by 68?

Answer: 66

Explanation:

$(x^n + 1)$ will be divisible by $(x + 1)$ only when n is odd.

$(67^{67} + 1)$ will be divisible by $(67 + 1)$

$(67^{67} + 1) + 66$, when divided by 68 will give 66 as remainder.

49. Which of the following is a prime number?

- | | |
|-------|-------|
| A. 33 | B. 81 |
| C. 93 | D. 97 |

Answer: 97

Explanation:

Clearly, 97 is a prime number.

So, the number is either 96 or 69.

Hence, the number cannot be determined.

2. The sum of the squares of three numbers is 138, while the sum of their products taken two at a time is 131. Their sum is:

Answer: 20

Explanation:

Let the numbers be a , b and c .

Then, $a^2 + b^2 + c^2 = 138$ and $(ab + bc + ca) = 131$.

$$(a + b + c)^2 = a^2 + b^2 + c^2 + 2(ab + bc + ca) = 138 + 2 \times 131 = 400.$$

$$(a + b + c) = \sqrt{400} = 20.$$

3. A number consists of two digits. If the digits interchange places and the new number is added to the original number, then the resulting number will be divisible by:

Answer: 11

Explanation:

Let the ten's digit be x and unit's digit be y .

Then, number = $10x + y$.

Number obtained by interchanging the digits = $10y + x$.

$$(10x + y) + (10y + x) = 11(x + y), \text{ which is divisible by 11.}$$

4. In a two-digit, if it is known that its unit's digit exceeds its ten's digit by 2 and that the product of the given number and the sum of its digits is equal to 144, then the number is:

Answer: 24

Explanation:

Let the ten's digit be x .

Then, unit's digit = $x + 2$.

Number = $10x + (x + 2) = 11x + 2$.

Sum of digits = $x + (x + 2) = 2x + 2$.

$$(11x + 2)(2x + 2) = 144$$

$$22x^2 + 26x - 140 = 0$$

$$11x^2 + 13x - 70 = 0$$

$$(x - 2)(11x + 35) = 0$$

$$x = 2.$$

PROBLEMS ON NUMBERS

1. The sum of the digits of a two-digit number is 15 and the difference between the digits is 3.

What is the two-digit number?

Answer: the number cannot be determined

Explanation:

Let the ten's digit be x and unit's digit be y .

Then, $x + y = 15$ and $x - y = 3$ or $y - x = 3$.

Solving $x + y = 15$ and $x - y = 3$, we get: $x = 9$, $y = 6$.

Solving $x + y = 15$ and $y - x = 3$, we get: $x = 6$, $y = 9$.

Hence, required number = $11x + 2 = 24$.

$$(x + y)^2 = x^2 + y^2 + 2xy = 289 + (2 \times 120) = 529$$

5. Find a positive number which when increased by 17 is equal to 60 times the reciprocal of the number.

Answer: 3

Explanation:

Let the number be x .

$$\text{Then, } x + 17 = \frac{60}{x}$$

$$x^2 + 17x - 60 = 0$$

$$(x + 20)(x - 3) = 0$$

$$x = 3.$$

6. The product of two numbers is 9375 and the quotient, when the larger one is divided by the smaller, is 15. The sum of the numbers is:

Answer: 400

Explanation:

Let the numbers be x and y .

$$\text{Then, } xy = 9375 \text{ and } \frac{x}{y} = 15.$$

$$\frac{xy}{(x/y)} = \frac{9375}{15}$$

$$y^2 = 625.$$

$$y = 25.$$

$$x = 15y = (15 \times 25) = 375.$$

$$\text{Sum of the numbers} = x + y = 375 + 25 = 400.$$

7. The product of two numbers is 120 and the sum of their squares is 289. The sum of the number is:

Answer: 23

Explanation:

Let the numbers be x and y .

$$\text{Then, } xy = 120 \text{ and } x^2 + y^2 = 289.$$

$$x + y = \sqrt{529} = 23.$$

8. A number consists of 3 digits whose sum is 10. The middle digit is equal to the sum of the other two and the number will be increased by 99 if its digits are reversed. The number is:

Answer: 253

Explanation:

Let the middle digit be x .

Then, $2x = 10$ or $x = 5$. So, the number is either 253 or 352.

Since the number increases on reversing the digits, so the hundred's digit is smaller than the unit's digit.

Hence, required number = 253.

9. The sum of two number is 25 and their difference is 13. Find their product.

Answer: 114

Explanation:

Let the numbers be x and y .

$$\text{Then, } x + y = 25 \text{ and } x - y = 13.$$

$$\begin{aligned} 4xy &= (x + y)^2 - (x - y)^2 \\ &= (25)^2 - (13)^2 \\ &= (625 - 169) \\ &= 456 \end{aligned}$$

$$xy = 114.$$

10. What is the sum of two consecutive even numbers, the difference of whose squares is 84?

Answer: 42

Explanation:

Let the numbers be x and $x + 2$.

$$\text{Then, } (x + 2)^2 - x^2 = 84$$

$$4x + 4 = 84$$

$$4x = 80$$

$$x = 20.$$

$$\text{The required sum} = x + (x + 2) = 2x + 2 = 42.$$

11. If one-third of one-fourth of a number is 15, then three-tenth of that number is:

Answer: 54

Explanation:

Let the number be x .

$$\text{Then, } \frac{1}{3} \text{ of } \frac{1}{4} \text{ of } x = 15$$
$$x = 15 \times 12 = 180.$$
$$\text{So, required number} = \frac{3}{10} \times 180 = 54.$$

$$x = 4.$$

$$\text{Required difference} = (2x + x) - (2x - x) = 2x = 8.$$

15. A two-digit number is such that the product of the digits is 8. When 18 is added to the number, then the digits are reversed. The number is:

Answer: 2

Explanation:

Let the ten's and unit digit be x and $\frac{8}{x}$ respectively.

$$\text{Then, } 10x + \frac{8}{x} + 18 = 10 \times \frac{8}{x} + x$$

$$10x^2 + 8 + 18x = 80 + x^2$$

$$9x^2 + 18x - 72 = 0$$

$$x^2 + 2x - 8 = 0$$

$$(x+4)(x-2) = 0$$

$$x = 2.$$

FIND ODD NUMBER

1. 1, 4, 9, 16, 23, 25, 36

Answer: 23

Explanation:

Each of the numbers except 23, is perfect square.

2. 1, 4, 9, 16, 20, 36, 49

Answer: 20

Explanation:

The pattern is $1^2, 2^2, 3^2, 4^2, 5^2, 6^2, 7^2$. But, instead of 5^2 , it is 20 which to be turned out.

3. 2, 5, 10, 17, 26, 37, 50, 64

Answer: 64

Explanation:

$(1^1)+1, (2^2)+1, (3^3)+1, (4^4)+1, (5^5)+1, (6^6)+1, (7^7)+1, (8^8)+1$

But, 64 is out of pattern.

$$9(x - y) = 36$$

$$x - y = 4.$$

14. The difference between a two-digit number and the number obtained by interchanging the digits is 36. What is the difference between the sum and the difference of the digits of the number if the ratio between the digits of the number is 1 : 2 ?

Answer: 8

Explanation:

Since the number is greater than the number obtained on reversing the digits, so the ten's digit is greater than the unit's digit.

Let ten's and unit's digits be $2x$ and x respectively.

$$\text{Then, } (10 \times 2x + x) - (10x + 2x) = 36$$

$$9x = 36$$

4. 10, 14, 16, 18, 21, 24, 26

Answer: 21

Explanation:

Each of the numbers except 21 is an even number.

5. 16, 25, 36, 72, 144, 196, 225

Answer: 72

Explanation:

Each of the numbers except 72 is a perfect square.

6. 331, 482, 551, 263, 383, 362, 284

Answer: 383

Explanation:

In each number except 383, the product of first and third digits is the middle one.

7. 835, 734, 642, 751, 853, 981, 532

Answer: 751

Explanation:

In each number except 751, the difference of third and first digit is the middle one.

8. 41, 43, 47, 53, 61, 71, 73, 81

Answer: 81

Explanation:

Each of the numbers except 81 is a prime number.

9. 3, 5, 7, 12, 17, 19

Answer: 12

Explanation:

Each of the numbers is a prime number except 12.

10. 3, 5, 11, 14, 17, 21

Answer: 14

Explanation:

Each of the numbers except 14 is an odd number.

The number '14' is the only EVEN number.

11. 8, 27, 64, 100, 125, 216, 343

Answer: 100

Explanation:

The pattern is $2^3, 3^3, 4^3, 5^3, 6^3, 7^3$. But, 100 is not a perfect cube.

12. 10, 25, 45, 54, 60, 75, 80

Answer: 54

Explanation:

Each of the numbers except 54 is multiple of 5.

13. 396, 462, 572, 396, 427, 671, 264

Answer: 427

Explanation:

In each number except 427, the middle digit is the sum of other two.

14. 6, 9, 15, 21, 24, 28, 30

Answer: 28

Explanation:

Each of the numbers except 28, is a multiple of 3.

WRONG MAN OUT

1. 52, 51, 48, 43, 34, 27, 16

Answer: 34

Explanation:

Subtract 1, 3, 5, 7, 9, 11 from successive numbers.

So, 34 is wrong.

2. 4, 6, 8, 9, 10, 11, 12

Answer: 11

Explanation:

Each number is a composite number except 11.

3. 105, 85, 60, 30, 0, -45, -90

Answer: 0

Explanation:

Subtract 20, 25, 30, 35, 40, 45 from successive numbers.

So, 0 is wrong.

4. 5, 16, 6, 16, 7, 16, 9

Answer: 9

Explanation:

Terms at odd places are 5, 6, 7, 8 etc. and each term at even place is 16.

So, 9 is wrong.

5. 125, 127, 130, 135, 142, 153, 165

Answer: 165

Explanation:

Prime numbers 2, 3, 5, 7, 11, 13 are to be added successively.

So, 165 is wrong.

6. 46080, 3840, 384, 48, 24, 2, 1

Answer: 24

Explanation:

The terms are successively divided by 12, 10, 8, 6, ...etc.

So, 24 is wrong, it should be 8 ($48/6 = 8$).

7. 6, 13, 18, 25, 30, 37, 40

Answer: 40

Explanation:

The differences between two successive terms from the beginning are 7, 5, 7, 5, 7, 5.

So, 40 is wrong.

8. 36, 54, 18, 27, 9, 18.5, 4.5

Answer: 18.5

Explanation:

The terms are alternatively multiplied by 1.5 and divided by 3. However, 18.5 does not satisfy it.

9. 56, 72, 90, 110, 132, 150

Answer: 150

Explanation:

The numbers are 7×8 , 8×9 , 9×10 , 10×11 , 11×12 , 12×13 .

So, 150 is wrong.

10. 25, 36, 49, 81, 121, 169, 225

Answer: 36

Explanation:

The numbers are squares of odd natural numbers, starting from 5 up to 15.

So, 36 is wrong.

11. 582, 605, 588, 611, 634, 617, 600

Answer: 634

Explanation:

Alternatively 23 is added and 17 is subtracted from the terms. So, 634 is wrong.

12. 22, 33, 66, 99, 121, 279, 594

Answer: 279

Explanation:

Each of the number except 279 is a multiple of 11.

13. 8, 13, 21, 32, 47, 63, 83

Answer: 47

Explanation:

Go on adding 5, 8, 11, 14, 17, 20.

So, the number 47 is wrong and must be replaced by 46.

14. 1, 8, 27, 64, 124, 216, 343

Answer: 124

Explanation:

The numbers are 1^3 , 2^3 , 3^3 , 4^3 etc. So, 124 is wrong; it must have been 5^3 i.e., 125.

15. 1, 2, 6, 15, 31, 56, 91

Answer: 91

Explanation:

$1, 1 + 1^2 = 2, 2 + 2^2 = 6, 6 + 3^2 = 15, 15 + 4^2 = 31, 31 + 5^2 = 56, 56 + 6^2 = 92$

Last number of given series must be 92 not 91.

MISSING MAN OUT

1. 1, 4, 9, 16, 25, 36, 49, (...)

Answer: 64

Explanation:

Numbers are 1^2 , 2^2 , 3^2 , 4^2 , 5^2 , 6^2 , 7^2 .

So, the next number is $8^2 = 64$.

2. 2, 4, 12, 48, 240, (...)

Answer: 1440

Explanation:

Go on multiplying the given numbers by 2, 3, 4, 5, 6.

So, the correct next number is 1440.

3. 8, 7, 11, 12, 14, 17, 17, 22, (...)

Answer: 20

Explanation:

There are two series (8, 11, 14, 17, 20) and (7, 12, 17, 22) increasing by 3 and 5 respectively.

4. 8, 24, 12, 36, 18, 54, (...)

Answer: 27

Explanation:

Numbers are alternatively multiplied by 3 and divided by 2.

So, the next number = $54 \div 2 = 27$.

5. 11, 13, 17, 19, 23, 29, 31, 37, 41, (...)

Answer: 43

Explanation:

Numbers are all primes. The next prime is 43.

6. 2, 6, 12, 20, 30, 42, 56, (...)

Answer: 72

Explanation:

The pattern is 1×2 , 2×3 , 3×4 , 4×5 , 5×6 , 6×7 , 7×8 .

So, the next number is $8 \times 9 = 72$.

7. 4, -8, 16, -32, 64, (...)

Answer: -128

Explanation:

Each number is the proceeding number multiplied by -2.

So, the required number is -128.

8. 7, 26, 63, 124, 215, 342, (...)

Answer: 511

Explanation:

Numbers are $(2^3 - 1)$, $(3^3 - 1)$, $(4^3 - 1)$, $(5^3 - 1)$, $(6^3 - 1)$, $(7^3 - 1)$ etc.

So, the next number is $(8^3 - 1) = (512 - 1) = 511$.

9. 5, 10, 13, 26, 29, 58, 61, (...)

Answer: 122

Explanation:

Numbers are alternatively multiplied by 2 and increased by 3.

So, the missing number = $61 \times 2 = 122$.

10. 15, 31, 63, 127, 255, (...)

Answer: 511

Explanation:

Each number is double the preceding one plus 1.

So, the next number is $(255 \times 2) + 1 = 511$.

11. 1, 8, 27, 64, 125, 216, (...)

Answer: 343

Explanation:

Numbers are 1^3 , 2^3 , 3^3 , 4^3 , 5^3 , 6^3 .

So, the missing number is $7^3 = 343$.

12. 3, 7, 6, 5, 9, 3, 12, 1, 15, (...)

Answer: -1

Explanation:

There are two series, beginning respectively with 3 and 7. In one 3 is added and in another 2 is subtracted.

The next number is $1 - 2 = -1$.

13. 16, 33, 65, 131, 261, (...)

Answer: 523

Explanation:

Each number is twice the preceding one with 1 added or subtracted alternatively.

So, the next number is $(2 \times 261 + 1) = 523$.

14. 10, 5, 13, 10, 16, 20, 19, (...)

Answer: 40

Explanation:

There are two series (10, 13, 16, 19) and (5, 10, 20, 40), one increasing by 3 and the other multiplied by 2.

WRONG NUMBER OUT

1. 196, 169, 144, 121, 100, 80, 64

Answer: 80

Explanation:

Numbers must be $(14)^2$, $(13)^2$, $(12)^2$, $(11)^2$, $(10)^2$, $(9)^2$, $(8)^2$.

So, 80 is wrong.

2. 445, 221, 109, 46, 25, 11, 4

Answer: 46

Explanation:

Go on subtracting 3 and dividing the result by 2 to obtain the next number.

Clearly, 46 is wrong.

3. 190, 166, 145, 128, 112, 100, 91

Answer: 128

Explanation:

Go on subtracting 24, 21, 18, 15, 12, 9 from the numbers to get the next number.

$$190 - 24 = 166$$

$$166 - 21 = 145$$

$$145 - 18 = 127 \text{ [Here, 128 is placed instead of 127]}$$

$$127 - 15 = 112$$

$$112 - 12 = 100 \dots \text{and so on.}$$

Therefore, 128 is wrong.

4. 19, 26, 33, 46, 59, 74, 91

Answer: 35

Explanation:

Go on adding 7, 9, 11, 13, 15, 17 respectively to obtain the next number.

So, 33 is wrong. It must be 35

5. 1, 3, 10, 21, 64, 129, 356, 777

Answer: 356

Explanation:

A $\times 2 + 1$, B $\times 3 + 1$, C $\times 2 + 1$, D $\times 3 + 1$ and so on.

So, 356 is wrong.

6. 6, 12, 48, 100, 384, 768, 3072

Answer: 100

Explanation:

Each even term of the series is obtained by multiplying the previous term by 2.

$$2^{\text{nd}} \text{ term} = (1^{\text{st}} \text{ term}) \times 2 = 6 \times 2 = 12$$

$$4^{\text{th}} \text{ term} = (3^{\text{rd}} \text{ term}) \times 2 = 48 \times 2 = 96.$$

$$6^{\text{th}} \text{ term} = (5^{\text{th}} \text{ term}) \times 2 = 384 \times 2 = 768.$$

4th term should be 96 instead of 100.

7. 40960, 10240, 2560, 640, 200, 40, 10

Answer: 200

Explanation:

Go on dividing by 4 to get the next number.

So, 200 is wrong.

8. 3, 7, 15, 39, 63, 127, 255, 511

Answer: 39

Explanation:

Go on multiplying 2 and adding 1 to get the next number.

So, 39 is wrong.

9. 64, 71, 80, 91, 104, 119, 135, 155

Answer: 135

Explanation:

Go on adding 7, 9, 11, 13, 15, 17, 19 respectively to obtain the next number.

So, 135 is wrong.

10. 15, 16, 34, 105, 424, 2124, 12576

Answer: 2124

Explanation:

$$2^{\text{nd}} \text{ term} = (1^{\text{st}} \text{ term}) \times 1 + 1 = 15 \times 1 + 1 = 16.$$

$$3^{\text{rd}} \text{ term} = (2^{\text{nd}} \text{ term}) \times 2 + 2 = 16 \times 2 + 2 = 34.$$

$$4^{\text{th}} \text{ term} = (3^{\text{rd}} \text{ term}) \times 3 + 3 = 34 \times 3 + 3 = 105.$$

$$5^{\text{th}} \text{ term} = (4^{\text{th}} \text{ term}) \times 4 + 4 = 105 \times 4 + 4 = 424$$

$$6^{\text{th}} \text{ term} = (5^{\text{th}} \text{ term}) \times 5 + 5 = 424 \times 5 + 5 = 2125$$

6th term should 2125 instead of 2124.

11. 10, 26, 74, 218, 654, 1946, 5834

Answer: 654

Explanation:

2nd term = (1st term) x 3 - 4 = 10 x 3 - 4 = 26.
 3rd term = (2nd term) x 3 - 4 = 26 x 3 - 4 = 74.
 4th term = (3rd term) x 3 - 4 = 74 x 3 - 4 = 218.
 5th term = (4th term) x 3 - 4 = 218 x 3 - 4 = 650.

5th term must be 650 instead of 654.

12. 2880, 480, 92, 24, 8, 4, 4

Answer: 92

Explanation:

Go on dividing by 6, 5, 4, 3, 2, 1 respectively to obtain the next number.
 Clearly, 92 is wrong.

13. 3, 7, 15, 27, 63, 127, 255

Answer: 27

Explanation:

Go on multiplying the number by 2 and adding 1 to it to get the next number.
 So, 27 is wrong.

14. 1, 1, 2, 6, 24, 96, 720

Answer: 96

Explanation:

Go on multiplying with 1, 2, 3, 4, 5, 6 to get next number.

So, 96 is wrong.

15. 7, 8, 18, 57, 228, 1165, 6996

Answer: 228

Explanation:

Let the given numbers be A, B, C, D, E, F, G.

Then, A, A x 1 + 1, B x 2 + 2, C x 3 + 3, D x 4 + 4, E x 5 + 5, F x 6 + 6 are the required numbers.

Clearly, 228 is wrong.

NUMBER SERIES

1. Look at this series: 2, 1, (1/2), (1/4), ... What number should come next?

Answer: 1/8

Explanation:

This is a simple division series; each number is one-half of the previous number.

In other terms to say, the number is divided by 2 successively to get the next result.

$$4/2 = 2$$

$$2/2 = 1$$

$$1/2 = 1/2$$

$$(1/2)/2 = 1/4$$

(1/4)/2 = 1/8 and so on.

2. Look at this series: 7, 10, 8, 11, 9, 12, ... What number should come next?

Answer: 10

Explanation:

This is a simple alternating addition and subtraction series. In the first pattern, 3 is added; in the second, 2 is subtracted.

3. Look at this series: 36, 34, 30, 28, 24, ... What number should come next?

Answer: 22

Explanation:

This is an alternating number subtraction series. First, 2 is subtracted, then 4, then 2, and so on.

4. Look at this series: 22, 21, 23, 22, 24, 23, ... What number should come next?

Answer: 22

Explanation:

In this simple alternating subtraction and addition series; 1 is subtracted, then 2 is added, and so on.

5. Look at this series: 53, 53, 40, 40, 27, 27, ... What number should come next?

Answer: 14

Explanation:

In this series, each number is repeated, then 13 is subtracted to arrive at the next number.

6. Look at this series: 21, 9, 21, 11, 21, 13, 21, ... What number should come next?

Answer: 15

Explanation:

In this alternating repetition series, the random number 21 is interpolated every other number into an otherwise simple addition series that increases by 2, beginning with the number 9.

7. Look at this series: 58, 52, 46, 40, 34, ... What number should come next?

Answer: 28

Explanation:

This is a simple subtraction series. Each number is 6 less than the previous number.

8. Look at this series: 3, 4, 7, 8, 11, 12, ... What number should come next?

Answer: 15

Explanation:

This alternating addition series begins with 3; then 1 is added to give 4; then 3 is added to give 7; then 1 is added, and so on.

9. Look at this series: 8, 22, 8, 28, 8, ... What number should come next?

Answer: 34

Explanation:

This is a simple addition series with a random number, 8, interpolated as every other number. In the series, 6 is added to each number except 8, to arrive at the next number.

10. Look at this series: 31, 29, 24, 22, 17, ... What number should come next?

Answer: 15

Explanation:

This is a simple alternating subtraction series, which subtracts 2, then 5.

11. 9 16 23 30 37 44 51

Answer: 58 65

Explanation:

Here is a simple addition series, which begins with 9 and adds 7.

12. 2 8 14 20 26 32 38

Answer: 44 50

Explanation:

This is a simple addition series, which begins with 2 and adds 6.

13. 9 11 33 13 15 33 17

Answer: 19 33

Explanation:

In this alternating repetition series, a random number, 33, is interpolated every third number into a simple addition series, in which each number increases by 2.

14. 2 3 4 5 6 4 8

Answer: 9 4

Explanation:

This is an alternating addition series with a random number, 4, interpolated as every third number. In the main series, 1 is added, then 2 is added, then 1, then 2, and so on.

15. 17 17 34 20 20 31 23

Answer: 23 28

Explanation:

This is an alternating subtraction series with repetition. There are two different patterns here.

In the first, a number repeats itself; then 3 is added to that number to arrive at the next number, which also repeats. This gives the series 17, 17, 20, 20, 23, and so on. Every third number follows a second pattern, in which 3 is subtracted from each number to arrive at the next: 34, 31, 28.

16. 6 20 8 14 10 8 12

Answer: 2 14

Explanation:

This is an alternating addition and subtraction series. In the first pattern, 2 is added to each number to arrive at the next; in the alternate pattern, 6 is subtracted from each number to arrive at the next.

17. 21 25 18 29 33 18

Answer: 37 41

Explanation:

This is a simple addition series with a random number, 18, interpolated as every third number. In the series, 4 is added to each number except 18, to arrive at the next number.

18. 75 65 85 55 45 85 35

Answer: 25 85

Explanation:

This is a simple subtraction series in which a random number, 85, is interpolated as every third number. In the subtraction series, 10 is subtracted from each number to arrive at the next.

19. 11 16 21 26 31 36 41

Answer: 46 51

Explanation:

In this simple addition series, each number is 5 more than the previous number.

20. 42 40 38 35 33 31 28

Answer: 26 24

Explanation:

This is an alternating subtraction series in which 2 is subtracted twice, then 3 is subtracted once, then 2 is subtracted twice, and so on.

21. 6 10 14 18 22 26 30

Answer: 34 38

Explanation:

This simple addition series adds 4 to each number to arrive at the next.

22. 8 12 9 13 10 14 11

Answer: 15 12

Explanation:

This is an alternating addition and subtraction series, in which the addition of 4 is alternated with the subtraction of 3.

23. 36 31 29 24 22 17 15

Answer: 10 8

Explanation:

This is an alternating subtraction series, which subtracts 5, then 2, then 5, and so on.

24. 3 5 35 10 12 35 17

Answer: 19 35

Explanation:

This is an alternating addition series, with a random number, 35, interpolated as every third number.

The pattern of addition is to add 2, add 5, add 2, and so on. The number 35 comes after each "add 2" step/

25. 13 29 15 26 17 23 19

Answer: 20 21

Explanation:

Here, there are two alternating patterns, with every other number following a different pattern. The first pattern begins with 13 and adds 2 to each number to arrive at the next; the alternating pattern begins with 29 and subtracts 3 each time.

26. 14 14 26 26 38 38 50

Answer: 50 62

Explanation:

In this simple addition with repetition series, each number in the series repeats itself, and then increases by 12 to arrive at the next number.

27. 44 41 38 35 32 29 26

Answer: 23 20

Explanation:

This is a simple subtraction series, in which 3 is subtracted from each number to arrive at the next.

28. 34 30 26 22 18 14 10

Answer: 6 2

Explanation:

This is a simple subtraction series, in which 4 is subtracted from each number to arrive at the next.

29. 32 31 32 29 32 27 32

Answer: 25 32

Explanation:

This is an alternating repetition series. The number 32 alternates with a series in which each number decreases by 2.

30. Look at this series: VI, 10, V, 11, __, 12, III, ... What number should fill the blank?

Answer: IV

Explanation:

This is an alternating addition and subtraction series. Roman numbers alternate with Arabic numbers. In the Roman numeral pattern, each number decreases by 1. In the Arabic numeral pattern, each number increases by 1.

31. Look at this series: (1/9), (1/3), 1, __, 9, ... What number should fill the blank?

Answer: 3

Explanation:

This is a multiplication series; each number is 3 times the previous number.

32. Look at this series: 83, 73, 93, 63, __, 93, 43, ... What number should fill the blank?

Answer: 53

Explanation:

This is a simple subtraction series in which a random number, 93, is interpolated as every third number. In the subtraction series, 10 is subtracted from each number to arrive at the next.

33. Look at this series: 15, __, 27, 27, 39, 39, ... What number should fill the blank?

Answer: 15

Explanation:

In this simple addition with repetition series, each number in the series repeats itself, and then increases by 12 to arrive at the next number.

34. Look at this series: 72, 76, 73, 77, 74, __, 75, ... What number should fill the blank?

Answer: 78

Explanation:

This series alternates the addition of 4 with the subtraction of 3.

35. Look at this series: J14, L16, __, P20, R22, ... What number should fill the blank?

Answer: N18

Explanation:

In this series, the letters progress by 2, and the numbers increase by 2.

36.. Look at this series: 4, 7, 25, 10, __, 20, 16, 19, ... What number should fill the blank?

Answer: 13

Explanation:

Two series alternate here, with every third number following a different pattern. In the main series, 3 is added to each number to arrive at the next. In the alternating series, 5 is subtracted from each number to arrive at the next.

37. Look at this series: XXIV, XX, __, XII, VIII, ... What number should fill the blank?

Answer: XVI

Explanation:

This is a simple subtraction series; each number is 4 less than the previous number.

38. Look at this series: 0.15, 0.3, __, 1.2, 2.4, ... What number should fill the blank?

Answer: 0.6

Explanation:

This is a simple multiplication series. Each number is 2 times greater than the previous number.

39. Look at this series: U32, V29, __, X23, Y20, ... What number should fill the blank?

Answer: W26

Explanation:

In this series, the letters progress by 1; the numbers decrease by 3.

$$\text{Then, } \frac{130 + x}{30} = 2$$

$$2(130 + x) = 750$$

$$x = 245 \text{ m.}$$

3. Two trains running in opposite directions cross a man standing on the platform in 27 seconds and 17 seconds respectively and they cross each other in 23 seconds. The ratio of their speeds is:

Answer: 3/2

Explanation:

Let the speeds of the two trains be x m/sec and y m/sec respectively.

Then, length of the first train = $27x$ metres,
and length of the second train = $17y$ metres.

$$\frac{27x + 17y}{x+y} = 23$$

$$27x + 17y = 23x + 23y$$

$$4x = 6y$$

$$\times 3$$

$$y = 2.$$

4. A train passes a station platform in 36 seconds and a man standing on the platform in 20 seconds. If the speed of the train is 54 km/hr, what is the length of the platform?

Answer: 240m

Explanation:

$$\text{Speed} = \frac{54 \times 5}{18} \text{ m/sec} = 15 \text{ m/sec.}$$

$$\text{Length of the train} = (15 \times 20)\text{m} = 300 \text{ m.}$$

Let the length of the platform be x metres.

$$\text{Then, } \frac{x+300}{36} = 15$$

$$x+300 = 540$$

$$x = 240 \text{ m.}$$

5. A train 240 m long passes a pole in 24 seconds. How long will it take to pass a platform 650 m long?

Answer: 89sec

Explanation:

$$\text{Speed} = \frac{240}{24} \text{ m/sec} = 10 \text{ m/sec.}$$

$$\text{Required time} = \frac{240 + 650}{10} \text{ sec} = 89 \text{ sec.}$$

PROBLEMS ON TRAINS

1. A train running at the speed of 60 km/hr crosses a pole in 9 seconds. What is the length of the train?

Answer: 150m

Explanation:

$$\text{Speed} = \frac{60 \times 5}{18} \text{ m/sec} = \frac{50}{3} \text{ m/sec.}$$

$$\text{Length of the train} = (\text{Speed} \times \text{Time}) = \frac{50}{3} \times 9 \text{ m} = 150 \text{ m.}$$

2. The length of the bridge, which a train 130 metres long and travelling at 45 km/hr can cross in 30 seconds, is:

Answer: 245m

Explanation:

$$\text{Speed} = \frac{45 \times 5}{18} \text{ m/sec} = \frac{25}{2} \text{ m/sec.}$$

Time = 30 sec.

Let the length of bridge be x metres.

6.A train 360 m long is running at a speed of 45 km/hr. In what time will it pass a bridge 140 m long?

Answer: 40sec

Explanation:

$$\text{Formula for converting from km/hr to m/s: } X \text{ km/hr} = \frac{X \times 5}{18} \text{ m/s.}$$

$$\text{Therefore, Speed} = \frac{45 \times 5}{18} \text{ m/sec} = \frac{25}{2} \text{ m/sec.}$$

$$\text{Total distance to be covered} = (360 + 140) \text{ m} = 500 \text{ m}$$

$$\text{Formula for finding Time} = \frac{\text{Distance}}{\text{Speed}}$$

$$\text{Required time} = \frac{500 \times 2}{25} \text{ sec} = 40 \text{ sec.}$$

7. Two trains of equal length are running on parallel lines in the same direction at 46 km/hr and 36 km/hr. The faster train passes the slower train in 36 seconds. The length of each train is:

Answer: 50m

Explanation:

Let the length of each train be x metres.

Then, distance covered = $2x$ metres.

Relative speed = $(46 - 36)$ km/hr

$$= \frac{10 \times 5}{18} \text{ m/sec}$$

$$= \frac{25}{9} \text{ m/sec}$$

$$\begin{aligned} 2x &= \frac{25}{9} \\ 36 &= 9 \\ 2x &= 100 \end{aligned}$$

$$x = 50.$$

8.Two trains are moving in opposite directions @ 60 km/hr and 90 km/hr. Their lengths are 1.10 km and 0.9 km respectively. The time taken by the slower train to cross the faster train in seconds is:

Answer: 48sec

Explanation:

Relative speed = $(60 + 90)$ km/hr

$$= \frac{150 \times 5}{18} \text{ m/sec}$$

$$= \frac{125}{3} \text{ m/sec.}$$

$$\text{Distance covered} = (1.10 + 0.9) \text{ km} = 2 \text{ km} = 2000 \text{ m.}$$

$$\text{Required time} = \frac{2000}{\frac{125}{3}} = 48 \text{ sec.}$$

125

9.A jogger running at 9 kmph alongside a railway track in 240 metres ahead of the engine of a 120 metres long train running at 45 kmph in the same direction. In how much time will the train pass the jogger?

Answer: 36sec

Explanation:

Speed of train relative to jogger = $(45 - 9)$ km/hr = 36 km/hr.

$$= \frac{36 \times 5}{18} \text{ m/sec}$$

$$= 10 \text{ m/sec.}$$

$$\text{Distance to be covered} = (240 + 120) \text{ m} = 360 \text{ m.}$$

$$\text{Time taken} = \frac{360}{10} \text{ sec} = 36 \text{ sec.}$$

10. A 270 metres long train running at the speed of 120 kmph crosses another train running in opposite direction at the speed of 80 kmph in 9 seconds. What is the length of the other train?

Answer: 230m

Explanation:

Relative speed = $(120 + 80)$ km/hr

$$= \frac{200 \times 5}{18} \text{ m/sec}$$

$$= \frac{500}{9} \text{ m/sec.}$$

Let the length of the other train be x metres.

$$\begin{aligned} x + 270 &= 500 \\ \text{Then, } \frac{x}{9} &= \frac{500}{9} \\ x + 270 &= 500 \\ x &= 230. \end{aligned}$$

11.A goods train runs at the speed of 72 kmph and crosses a 250 m long platform in 26 seconds. What is the length of the goods train?

Answer: 270m

Explanation:

$$\text{Speed} = \frac{72 \times 5}{18} \text{ m/sec} = 20 \text{ m/sec.}$$

$$\text{Time} = 26 \text{ sec.}$$

Let the length of the train be x metres.

$$\text{Then, } \frac{x + 250}{26} = 20$$

$$x + 250 = 520$$

$$x = 270.$$

12. Two trains, each 100 m long, moving in opposite directions, cross each other in 8 seconds. If one is moving twice as fast the other, then the speed of the faster train is:

Answer: 60km/hr

Explanation:

Let the speed of the slower train be x m/sec.

Then, speed of the faster train = $2x$ m/sec.

Relative speed = $(x + 2x)$ m/sec = $3x$ m/sec.

$$\frac{(100 + 100)}{8} = 3x$$

$$\frac{24x}{25} = 200$$

$$x = 3$$

So, speed of the faster train = $\frac{50}{3}$ m/sec

$$= \frac{50}{3} \times \frac{18}{5} \text{ km/hr}$$

$$= 60 \text{ km/hr.}$$

13. Two trains 140 m and 160 m long run at the speed of 60 km/hr and 40 km/hr respectively in opposite directions on parallel tracks. The time (in seconds) which they take to cross each other, is:

Answer: 10.8sec

Explanation:

Relative speed = $(60 + 40)$ km/hr = $100 \times \frac{5}{18}$ m/sec = $\frac{250}{9}$ m/sec.

Distance covered in crossing each other = $(140 + 160)$ m = 300 m.

Required time = $300 \times \frac{9}{250}$ sec = $\frac{54}{5}$ sec = 10.8 sec.

14. A train 110 metres long is running with a speed of 60 kmph. In what time will it pass a man who is running at 6 kmph in the direction opposite to that in which the train is going?

Answer: 6sec

Explanation:

Speed of train relative to man = $(60 + 6)$ km/hr = 66 km/hr.

$$= 66 \times \frac{5}{18} \text{ m/sec}$$

$$= \frac{55}{3} \text{ m/sec.}$$

$$\text{Time taken to pass the man} = \frac{110 \times 3}{55} \text{ sec} = 6 \text{ sec.}$$

15. A train travelling at a speed of 75 mph enters a tunnel $\frac{7}{2} \frac{1}{4}$ miles long. The train is $\frac{1}{4}$ mile long. How long does it take for the train to pass through the tunnel from the moment the front enters to the moment the rear emerges?

Answer: 3min

Explanation:

$$\text{Total distance covered} = \frac{7}{2} \frac{1}{4} \text{ miles}$$

$$= \frac{15}{4} \text{ miles.}$$

$$\text{Time taken} = \frac{15}{4 \times 75} \text{ hrs}$$

$$= \frac{1}{20} \text{ hrs}$$

$$= \frac{1}{20} \times 60 \text{ min.}$$

$$= 3 \text{ min.}$$

16. A train 800 metres long is running at a speed of 78 km/hr. If it crosses a tunnel in 1 minute, then the length of the tunnel (in meters) is:

Answer: 500m

Explanation:

$$\text{Speed} = 78 \times \frac{5}{18} \text{ m/sec} = \frac{65}{3} \text{ m/sec.}$$

Time = 1 minute = 60 seconds.

Let the length of the tunnel be x metres.

$$\text{Then, } \frac{800 + x}{60} = \frac{65}{3}$$

$$3(800 + x) = 3900$$

$$x = 500.$$

17. A 300 metre long train crosses a platform in 39 seconds while it crosses a signal pole in 18 seconds. What is the length of the platform?

Answer: 350m

Explanation:

$$\text{Speed} = \frac{300}{18} \text{ m/sec} = \frac{50}{3} \text{ m/sec.}$$

Let the length of the platform be x metres.

$$\text{Then, } \frac{x + 300}{39} = \frac{50}{3}$$

$$3(x + 300) = 1950$$

$$x = 350 \text{ m.}$$

18. A train speeds past a pole in 15 seconds and a platform 100 m long in 25 seconds. Its length is:

Answer: 150m

Explanation:

Let the length of the train be x metres and its speed by y m/sec.

$$\begin{aligned} \text{Then, } & \frac{x}{y} = 15 & \frac{x}{y} = 15 \\ & x = 15y & x = 15y \\ & x + 100 = 25y & x + 100 = 25y \\ & 25 = 15 & 25 = 15 \end{aligned}$$

$$15(x + 100) = 25x$$

$$15x + 1500 = 25x$$

$$1500 = 10x$$

$$x = 150 \text{ m.}$$

19. A train moves past a telegraph post and a bridge 264 m long in 8 seconds and 20 seconds respectively. What is the speed of the train?

Answer: 79.2 km/hr

Explanation:

Let the length of the train be x metres and its speed by y m/sec.

$$\begin{aligned} \text{Then, } & \frac{x}{y} = 8 & x = 8y \\ & y = 8 & x = 8y \\ \text{Now, } & \frac{x + 264}{20} = y & \frac{x + 264}{20} = y \end{aligned}$$

$$8y + 264 = 20y$$

$$y = 22.$$

$$\text{Speed} = 22 \text{ m/sec} = \frac{22 \times 18}{5} \text{ km/hr} = 79.2 \text{ km/hr.}$$

20. How many seconds will a 500 metre long train take to cross a man walking with a speed of 3 km/hr in the direction of the moving train if the speed of the train is 63 km/hr?

Answer: 30sec

Explanation:

Speed of the train relative to man = $(63 - 3)$ km/hr

$$\begin{aligned} &= 60 \text{ km/hr} \\ &= 60 \times \frac{18}{5} \text{ m/sec} \\ &= \frac{50}{3} \text{ m/sec.} \end{aligned}$$

$$\begin{aligned} \text{Time taken to pass the man} &= \frac{500 \times 3}{50} \text{ sec} \\ &= 30 \text{ sec.} \end{aligned}$$

21. Two goods train each 500 m long, are running in opposite directions on parallel tracks. Their speeds are 45 km/hr and 30 km/hr respectively. Find the time taken by the slower train to pass the driver of the faster one.

Answer: 24sec

Explanation:

Relative speed == $(45 + 30)$ km/hr

$$\begin{aligned} &= \frac{75 \times 18}{5} \text{ m/sec} \\ &= \frac{125}{6} \text{ m/sec.} \end{aligned}$$

We have to find the time taken by the slower train to pass the DRIVER of the faster train and not the complete train.

So, distance covered = Length of the slower train.

Therefore, Distance covered = 500 m.

$$\text{Required time} = \frac{500 \times 6}{125} = 24 \text{ sec.}$$

22. Two trains are running in opposite directions with the same speed. If the length of each train is 120 metres and they cross each other in 12 seconds, then the speed of each train (in km/hr) is:

Answer: 36km/hr

Explanation:

Let the speed of each train be x m/sec.

Then, relative speed of the two trains = $2x$ m/sec.

$$\text{So, } 2x = \frac{(120 + 120)}{12}$$

$$2x = 20$$

$$x = 10.$$

$$\text{Speed of each train} = 10 \text{ m/sec} = \frac{10 \times 18}{5} \text{ km/hr} = 36 \text{ km/hr.}$$

23. Two trains of equal lengths take 10 seconds and 15 seconds respectively to cross a telegraph post. If the length of each train be 120 metres, in what time (in seconds) will they cross each other travelling in opposite direction?

Answer: 12sec

Explanation:

$$\text{Speed of the first train} = \frac{120}{10} \text{ m/sec} = 12 \text{ m/sec.}$$

$$\text{Speed of the second train} = \frac{120}{15} \text{ m/sec} = 8 \text{ m/sec.}$$

Relative speed = $(12 + 8) = 20$ m/sec.

$$(120 + 120)$$

Required time = 20 sec = 12 sec.

24. A train 108 m long moving at a speed of 50 km/hr crosses a train 112 m long coming from opposite direction in 6 seconds. The speed of the second train is:

Answer: 82km/hr

Explanation:

Let the speed of the second train be x km/hr.

Relative speed = $(x + 50)$ km/hr

$$\begin{aligned} &= (x + 50) \times \frac{5}{18} \text{ m/sec} \\ &= \frac{250 + 5x}{18} \text{ m/sec.} \end{aligned}$$

Distance covered = $(108 + 112) = 220$ m.

$$\begin{aligned} 220 & \\ 250 + 5x &= 6 \\ 18 & \end{aligned}$$

$250 + 5x = 660$

$x = 82$ km/hr.

25. A train 125 m long passes a man, running at 5 km/hr in the same direction in which the train is going, in 10 seconds. The speed of the train is:

Answer: 50km/hr

Explanation:

Speed of the train relative to man = $\frac{125}{10}$ m/sec

$$\begin{aligned} &= \frac{25}{2} \text{ m/sec.} \\ &= \frac{25}{2} \times \frac{18}{5} \text{ km/hr} \end{aligned}$$

= 45 km/hr.

Let the speed of the train be x km/hr. Then, relative speed = $(x - 5)$ km/hr.

$x - 5 = 45$ $x = 50$ km/hr.

TIME AND DISTANCE

1.In a flight of 600 km, an aircraft was slowed down due to bad weather. Its average speed for the trip was reduced by 200 km/hr and the time of flight increased by 30 minutes. The duration of

the flight is:

Answer: 1hr

Explanation:

Let the duration of the flight be x hours.

Then, $\frac{600}{x} - \frac{600}{x + (1/2)} = 200$

$$\frac{600}{x} - \frac{1200}{2x+1} = 200$$

$$x(2x+1) = 3$$

$$2x^2 + x - 3 = 0$$

$$(2x+3)(x-1) = 0$$

$x = 1$ hr. [neglecting the -ve value of x]

2. A man complete a journey in 10 hours. He travels first half of the journey at the rate of 21 km/hr and second half at the rate of 24 km/hr. Find the total journey in km.

Answer: 224km

Explanation:

$$\frac{(1/2)x}{21} + \frac{(1/2)x}{24} = 10$$

$$\frac{x}{21} + \frac{x}{24} = 20$$

$15x = 168 \times 20$

$$\begin{aligned} 168 \times 20 & \\ x = 15 & \end{aligned} = 224 \text{ km.}$$

3. The ratio between the speeds of two trains is 7 : 8. If the second train runs 400 kms in 4 hours, then the speed of the first train is:

Answer: 87.5km/hr

Explanation:

Let the speed of two trains be $7x$ and $8x$ km/hr.

Then, $8x = \frac{400}{4} = 100$

$$\begin{aligned} x &= \frac{100}{8} = 12.5 \\ & \end{aligned}$$

Speed of first train = (7×12.5) km/hr = 87.5 km/hr.

4. A man on tour travels first 160 km at 64 km/hr and the next 160 km at 80 km/hr. The average speed for the first 320 km of the tour is:

Answer: 71.11km/hr

Explanation:

$$\begin{aligned} \text{Total time taken} &= \frac{160}{64} + \frac{160}{80} = \frac{9}{2} \text{ hrs.} \\ \text{Average speed} &= \frac{320}{\frac{9}{2}} = 71.11 \text{ km/hr.} \end{aligned}$$

5. A car travelling with its actual speed covers 42 km in 1 hr 40 min 48 sec. Find the actual speed of the car.

Answer: 35km/hr

Explanation:

$$\text{Time taken} = 1 \text{ hr } 40 \text{ min } 48 \text{ sec} = 1 \text{ hr } 40 \frac{4}{5} \text{ min} = 1 \frac{51}{75} \text{ hrs} = \frac{126}{75} \text{ hrs.}$$

Let the actual speed be x km/hr.

$$\begin{aligned} \text{Then, } \frac{5}{7} x \frac{126}{75} &= 42 \\ \frac{42 \times 7 \times 75}{5 \times 126} &= 35 \text{ km/hr.} \end{aligned}$$

6. In covering a distance of 30 km, Abhay takes 2 hours more than Sameer. If Abhay doubles his speed, then he would take 1 hour less than Sameer. Abhay's speed is:

Answer: 5km/hr

Explanation:

Let Abhay's speed be x km/hr.

$$\text{Then, } \frac{30}{x} - \frac{30}{2x} = 3$$

$$6x = 30$$

$$x = 5 \text{ km/hr.}$$

7. Robert is travelling on his cycle and has calculated to reach point A at 2 P.M. if he travels at 10 kmph, he will reach there at 12 noon if he travels at 15 kmph. At what speed must he travel to reach A at 1 P.M.?

Answer: 12kmph

Explanation:

Let the distance travelled by x km.

$$\text{Then, } \frac{x}{10} - \frac{x}{15} = 2$$

$$3x - 2x = 60$$

$$x = 60 \text{ km.}$$

$$\text{Time taken to travel } 60 \text{ km at } 10 \text{ km/hr} = \frac{60}{10} = 6 \text{ hrs.}$$

So, Robert started 6 hours before 2 P.M. i.e., at 8 A.M.

$$\text{Required speed} = \frac{60}{5} = 12 \text{ kmph.}$$

8. It takes eight hours for a 600 km journey, if 120 km is done by train and the rest by car. It takes 20 minutes more, if 200 km is done by train and the rest by car. The ratio of the speed of the train to that of the cars is:

Answer: 3:4

Explanation:

Let the speed of the train be x km/hr and that of the car be y km/hr.

$$\text{Then, } \frac{120}{x} + \frac{480}{y} = 8 \quad \frac{1}{x} + \frac{4}{y} = 1 \quad \dots(i)$$

$$\text{And, } \frac{200}{x} + \frac{400}{y} = 8 \quad \frac{1}{x} + \frac{2}{y} = 1 \quad \dots(ii)$$

Solving (i) and (ii), we get: $x = 60$ and $y = 80$.

$$\text{Ratio of speeds} = 60 : 80 = 3 : 4.$$

9. A farmer travelled a distance of 61 km in 9 hours. He travelled partly on foot @ 4 km/hr and partly on bicycle @ 9 km/hr. The distance travelled on foot is:

Answer: 16km

Explanation:

Let the distance travelled on foot be x km.

Then, distance travelled on bicycle = $(61 - x)$ km.

$$\text{So, } \frac{x}{4} + \frac{(61 - x)}{9} = 9$$

$$9x + 4(61 - x) = 9 \times 36$$

$$5x = 80$$

$$x = 16 \text{ km.}$$

10. A man covered a certain distance at some speed. Had he moved 3 kmph faster, he would have

taken 40 minutes less. If he had moved 2 kmph slower, he would have taken 40 minutes more.

The distance (in km) is:

Answer: 40

Explanation:

Let distance = x km and usual rate = y kmph.

$$\text{Then, } \frac{x}{y} - \frac{x}{y+3} = \frac{40}{60} \quad 2y(y+3) = 9x \dots \text{(i)}$$

$$\text{And, } \frac{x}{y-2} - \frac{x}{y} = \frac{40}{60} \quad y(y-2) = 3x \dots \text{(ii)}$$

On dividing (i) by (ii), we get: $x = 40$.

11. A person crosses a 600 m long street in 5 minutes. What is his speed in km per hour?

Answer: 7.2km/hr

Explanation:

$$\begin{aligned} \text{Speed} &= \frac{600}{5 \times 60} \text{ m/sec.} \\ &= 2 \text{ m/sec.} \end{aligned}$$

Converting m/sec to km/hr (see important formulas section)

$$\begin{aligned} &= 2 \times \frac{18}{5} \text{ km/hr} \\ &= 7.2 \text{ km/hr.} \end{aligned}$$

12. An aeroplane covers a certain distance at a speed of 240 kmph in 5 hours. To cover the same distance in $1\frac{2}{3}$ hours, it must travel at a speed of:

Answer: 720km/hr

Explanation:

Distance = $(240 \times 5) = 1200$ km.

Speed = Distance/Time

Speed = $1200/(5/3)$ km/hr. [We can write 1 hours as $5/3$ hours]

$$\text{Required speed} = \frac{1200 \times 3}{5} \text{ km/hr} = 720 \text{ km/hr.}$$

13 If a person walks at 14 km/hr instead of 10 km/hr, he would have walked 20 km more. The actual distance travelled by him is:

Answer: 50km

Explanation:

Let the actual distance travelled be x km.

$$\text{Then, } \frac{x}{10} = \frac{x+20}{14}$$

$$14x = 10x + 200$$

$$4x = 200$$

$$x = 50 \text{ km.}$$

14 A train can travel 50% faster than a car. Both start from point A at the same time and reach point B 75 kms away from A at the same time. On the way, however, the train lost about 12.5 minutes while stopping at the stations. The speed of the car is:

Answer: 120kmph

Explanation:

Let speed of the car be x kmph.

$$\begin{aligned} \text{Then, speed of the train} &= \frac{150}{100} x = \frac{3}{2} x \text{ kmph.} \\ \frac{75}{x} - \frac{75}{(3/2)x} &= \frac{125}{10 \times 60} \\ \frac{75}{x} - \frac{50}{x} &= \frac{5}{24} \\ \frac{25}{x} &= \frac{24}{24} \\ x &= 5 \quad = 120 \text{ kmph.} \end{aligned}$$

15. Excluding stoppages, the speed of a bus is 54 kmph and including stoppages, it is 45 kmph. For how many minutes does the bus stop per hour?

Answer: 10min

Explanation:

Due to stoppages, it covers 9 km less.

$$\text{Time taken to cover 9 km} = \frac{9}{54} \times 60 \text{ min} = 10 \text{ min.}$$

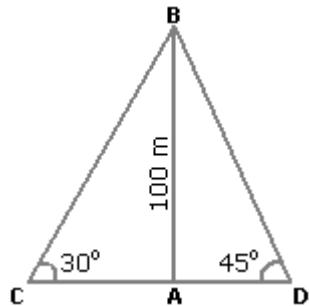
HEIGHT AND DISTANCE

1. Two ships are sailing in the sea on the two sides of a lighthouse. The angle of elevation of the top of the lighthouse is observed from the ships are 30° and 45° respectively. If the lighthouse is 100 m high, the distance between the two ships is:

Answer: 273m

Explanation:

Let AB be the lighthouse and C and D be the positions of the ships.



Then, $AB = 100 \text{ m}$, $\angle ACB = 30^\circ$ and $\angle ADB = 45^\circ$.

$$\frac{AB}{AC} = \tan 30^\circ = \frac{1}{\sqrt{3}}$$

$$AC = AB \times \sqrt{3} = 100\sqrt{3} \text{ m.}$$

$$\frac{AD}{AB} = \tan 45^\circ = 1$$

$$AD = AB = 100 \text{ m.}$$

$$CD = (AC + AD) = (100\sqrt{3} + 100) \text{ m}$$

$$= 100(3 + 1)$$

$$= (100 \times 2.73) \text{ m}$$

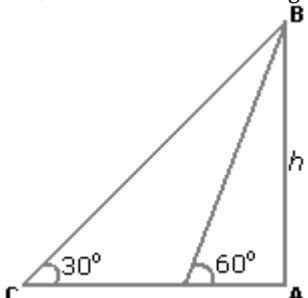
$$= 273 \text{ m.}$$

2. A man standing at a point P is watching the top of a tower, which makes an angle of elevation of 30° with the man's eye. The man walks some distance towards the tower to watch its top and the angle of the elevation becomes 60° . What is the distance between the base of the tower and the point P?

Answer: Data is inadequate.

Explanation:

One of AB, AD and CD must have given.



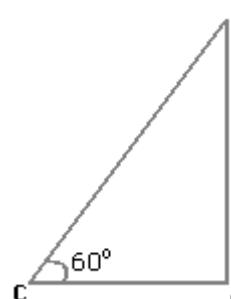
So, the data is inadequate.

3. The angle of elevation of a ladder leaning against a wall is 60° and the foot of the ladder is 4.6 m away from the wall. The length of the ladder is:

Answer: 9.2m

Explanation:

Let AB be the wall and BC be the ladder.



Then, $\angle ACB = 60^\circ$ and $AC = 4.6 \text{ m}$.

$$\frac{AC}{BC} = \cos 60^\circ = \frac{1}{2}$$

$$BC = 2 \times AC$$

$$= (2 \times 4.6) \text{ m}$$

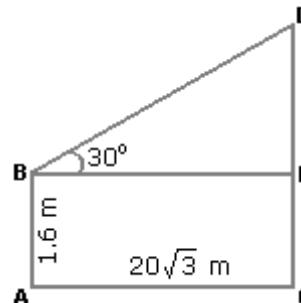
$$= 9.2 \text{ m.}$$

4. An observer 1.6 m tall is 203 away from a tower. The angle of elevation from his eye to the top of the tower is 30° . The heights of the tower is:

Answer: 21.6m

Explanation:

Let AB be the observer and CD be the tower.



Draw BE \perp CD.

Then, $CE = AB = 1.6 \text{ m}$,

$$BE = AC = 20\sqrt{3} \text{ m.}$$

$$\frac{DE}{BE} = \tan 30^\circ = \frac{1}{\sqrt{3}}$$

$$DE = \frac{203}{3} \text{ m} = 20 \text{ m.}$$

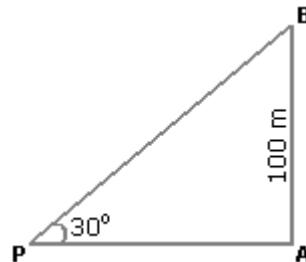
$$CD = CE + DE = (1.6 + 20) \text{ m} = 21.6 \text{ m.}$$

5. From a point P on a level ground, the angle of elevation of the top tower is 30° . If the tower is 100 m high, the distance of point P from the foot of the tower is:

Answer: 173m

Explanation:

Let AB be the tower.



$$\text{Then, } APB = 30^\circ \text{ and } AB = 100 \text{ m.}$$

$$\frac{AB}{AP} = \tan 30^\circ = \frac{1}{\sqrt{3}}$$

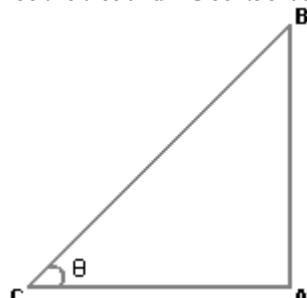
$$\begin{aligned} AP &= (AB \times \sqrt{3}) \text{ m} \\ &= 100\sqrt{3} \text{ m} \\ &= (100 \times 1.73) \text{ m} \\ &= 173 \text{ m.} \end{aligned}$$

6. The angle of elevation of the sun, when the length of the shadow of a tree 3 times the height of the tree, is:

Answer: 30° .

Explanation:

Let AB be the tree and AC be its shadow.



Let $\angle ACB = \theta$.

$$\text{Then, } \frac{AC}{AB} = \frac{\sqrt{3}}{3} \quad \cot \theta = \sqrt{3}$$

$$\theta = 30^\circ.$$

TIME AND WORK

- 1.If 6 men and 8 boys can do a piece of work in 10 days while 26 men and 48 boys can do the same in 2 days, the time taken by 15 men and 20 boys in doing the same type of work will be:

Answer: 4days

Explanation:

Let 1 man's 1 day's work = x and 1 boy's 1 day's work = y .

$$\text{Then, } 6x + 8y = \frac{1}{10} \text{ and } 26x + 48y = \frac{1}{2}.$$

$$\text{Solving these two equations, we get : } x = \frac{1}{100} \text{ and } y = \frac{1}{200}.$$

$$(15 \text{ men} + 20 \text{ boy})'s \text{ 1 day's work} = \frac{15}{100} + \frac{20}{200} = \frac{1}{4}.$$

15 men and 20 boys can do the work in 4 days.

- 2.A can do a piece of work in 4 hours; B and C together can do it in 3 hours, while A and C together can do it in 2 hours. How long will B alone take to do it?

Answer: 12hrs

Explanation:

$$\text{A's 1 hour's work} = \frac{1}{4};$$

$$(\text{B} + \text{C})'s \text{ 1 hour's work} = \frac{1}{3};$$

$$(\text{A} + \text{C})'s \text{ 1 hour's work} = \frac{1}{2}.$$

$$(\text{A} + \text{B} + \text{C})'s \text{ 1 hour's work} = \frac{1}{4} + \frac{1}{3} = \frac{7}{12}.$$

$$\text{B's 1 hour's work} = \frac{7}{12} - \frac{1}{2} = \frac{1}{12}.$$

B alone will take 12 hours to do the work.

- 3.A can do a certain work in the same time in which B and C together can do it. If A and B together could do it in 10 days and C alone in 50 days, then B alone could do it in:

Answer: 25days

Explanation:

$$(A + B)'s \text{ 1 day's work} = \frac{1}{10}$$

$$C's \text{ 1 day's work} = \frac{1}{50}$$

$$(A + B + C)'s \text{ 1 day's work} = \frac{1}{10} + \frac{1}{50} = \frac{6}{50} = \frac{3}{25} \dots \text{(i)}$$

$$A's \text{ 1 day's work} = (B + C)'s \text{ 1 day's work} \dots \text{(ii)}$$

$$\text{From (i) and (ii), we get: } 2 \times (A's \text{ 1 day's work}) = \frac{3}{25}$$

$$A's \text{ 1 day's work} = \frac{3}{50}$$

$$A's \text{ 1 day's work} = \frac{3}{50}$$

$$\begin{array}{r} 1 \ 3 \\ 10 \ 50 \\ \hline 50 \end{array} \quad \begin{array}{r} 2 \ 1 \\ 50 \ 25 \\ \hline 25 \end{array}$$

$$B's \text{ 1 day's work} = \frac{1}{50}$$

So, B alone could do the work in 25 days.

4.A does 80% of a work in 20 days. He then calls in B and they together finish the remaining work in 3 days. How long B alone would take to do the whole work?

$$\text{Answer: } 37\frac{1}{2} \text{ days.}$$

Explanation:

$$\text{Whole work is done by A in } 20 \times \frac{5}{4} = 25 \text{ days.}$$

$$\text{Now, } 1 - \frac{4}{5} \text{ i.e., } \frac{1}{5} \text{ work is done by A and B in 3 days.}$$

Whole work will be done by A and B in $(3 \times 5) = 15$ days.

$$A's \text{ 1 day's work} = \frac{1}{25}, (A + B)'s \text{ 1 day's work} = \frac{1}{15}.$$

$$\begin{array}{r} 1 \ 1 \\ 15 \ 25 \\ \hline 150 \end{array} \quad \begin{array}{r} 4 \ 2 \\ 150 \ 75 \\ \hline 75 \end{array}$$

$$\text{So, B alone would do the work in } \frac{75}{2} = 37\frac{1}{2} \text{ days.}$$

5.A machine P can print one lakh books in 8 hours, machine Q can print the same number of books in 10 hours while machine R can print them in 12 hours. All the machines are started at 9 A.M. while machine P is closed at 11 A.M. and the remaining two machines complete work.

Approximately at what time will the work (to print one lakh books) be finished?

Answer: Around 1 P.M

Explanation:

$$(P + Q + R)'s \text{ 1 hour's work} = \frac{1}{8} + \frac{1}{10} + \frac{1}{12} = \frac{37}{120}$$

$$\text{Work done by P, Q and R in 2 hours} = \frac{37}{120} \times 2 = \frac{37}{60}$$

$$\text{Remaining work} = 1 - \frac{37}{60} = \frac{23}{60}$$

$$(Q + R)'s \text{ 1 hour's work} = \frac{1}{10} + \frac{1}{12} = \frac{11}{60}$$

Now, $\frac{11}{60}$ work is done by Q and R in 1 hour.

$$\text{So, } \frac{23}{60} \text{ work will be done by Q and R in } \frac{60}{11} = 5\frac{5}{11} \text{ hours} = 5 \text{ hours } 30 \text{ minutes}$$

So, the work will be finished approximately 2 hours after 11 A.M., i.e., around 1 P.M.

6.P can complete a work in 12 days working 8 hours a day. Q can complete the same work in 8 days working 10 hours a day. If both P and Q work together, working 8 hours a day, in how many days can they complete the work?

$$\text{Answer: } 5\frac{5}{11} \text{ days.}$$

Explanation:

P can complete the work in (12×8) hrs. = 96 hrs.

Q can complete the work in (8×10) hrs. = 80 hrs.

$$P's \text{ 1 hour's work} = \frac{1}{96} \text{ and Q's 1 hour's work} = \frac{1}{80}$$

$$(P + Q)'s \text{ 1 hour's work} = \frac{1}{96} + \frac{1}{80} = \frac{11}{480}$$

So, both P and Q will finish the work in $\frac{480}{11}$ hrs.

$$\text{Number of days of 8 hours each} = \frac{480}{11} \times \frac{1}{8} = \frac{60}{11} = 5\frac{5}{11} \text{ days.}$$

7.A can finish a work in 18 days and B can do the same work in 15 days. B worked for 10 days and left the job. In how many days, A alone can finish the remaining work?

Answer: 6days

Explanation:

$$B's \text{ 10 day's work} = \frac{1}{15} \times 10 = \frac{2}{3}$$

$$\text{Remaining work} = 1 - \frac{2}{3} = \frac{1}{3}$$

Now, $\frac{1}{18}$ work is done by A in 1 day.

$$\frac{1}{3} \text{ work is done by A in } 18 \times \frac{1}{3} = 6 \text{ days.}$$

8.4 men and 6 women can complete a work in 8 days, while 3 men and 7 women can complete it in 10 days. In how many days will 10 women complete it?

Answer: 40days

Explanation:

Let 1 man's 1 day's work = x and 1 woman's 1 day's work = y .

$$\text{Then, } 4x + 6y = 1 \text{ and } 3x + 7y = 1$$

8 10

Solving the two equations, we get: $x = \frac{11}{400}$, $y = \frac{1}{400}$

$$\begin{array}{rcl} 1 \\ 1 \\ \hline 1 \end{array}$$

1 woman's 1 day's work = $\frac{1}{400}$

$$\begin{array}{rcl} 1 & & 1 \\ 400 \times 10 & = & 40 \\ \hline 10 \end{array}$$

Hence, 10 women will complete the work in 40 days.

9.A and B can together finish a work 30 days. They worked together for 20 days and then B left.

After another 20 days, A finished the remaining work. In how many days A alone can finish the work?

Answer: 60days

Explanation:

$$(A + B)'s 20 \text{ day's work} = \frac{1}{30} \times 20 = \frac{2}{3}$$

$$\text{Remaining work} = 1 - \frac{2}{3} = \frac{1}{3}$$

Now, $\frac{1}{3}$ work is done by A in 20 days.

Therefore, the whole work will be done by A in $(20 \times 3) = 60$ days.

10.10 women can complete a work in 7 days and 10 children take 14 days to complete the work.

How many days will 5 women and 10 children take to complete the work?

Answer: 7days.

Explanation:

$$1 \text{ woman's 1 day's work} = \frac{1}{70}$$

$$1 \text{ child's 1 day's work} = \frac{1}{140}$$

$$(5 \text{ women} + 10 \text{ children})'s \text{ day's work} = \frac{5}{70} + \frac{10}{140} = \frac{1}{14} + \frac{1}{14} = \frac{1}{7}$$

5 women and 10 children will complete the work in 7 days.

11.X and Y can do a piece of work in 20 days and 12 days respectively. X started the work alone and then after 4 days Y joined him till the completion of the work. How long did the work last?

Answer: 10days

Explanation:

$$\text{Work done by X in 4 days} = \frac{1}{20} \times 4 = \frac{1}{5}$$

$$\text{Remaining work} = 1 - \frac{1}{5} = \frac{4}{5}$$

$$(X + Y)'s 1 \text{ day's work} = \frac{1}{20} + \frac{1}{12} = \frac{8}{60} = \frac{2}{15}$$

Now, $\frac{2}{15}$ work is done by X and Y in 1 day.

$$\text{So, } \frac{4}{5} \text{ work will be done by X and Y in } \frac{15}{2} \times \frac{4}{5} = 6 \text{ days.}$$

Hence, total time taken = $(6 + 4)$ days = 10 days.

12.A is 30% more efficient than B. How much time will they, working together, take to complete a job which A alone could have done in 23 days?

Answer: 13days

Explanation:

Ratio of times taken by A and B = $100 : 130 = 10 : 13$.

Suppose B takes x days to do the work.

$$\begin{array}{rcl} 23 \times 13 & & 299 \\ \text{Then, } 10 : 13 :: 23 : x & \Rightarrow & x = 10 \\ & & x = 10 \end{array}$$

$$A's 1 \text{ day's work} = \frac{1}{23}$$

$$B's 1 \text{ day's work} = \frac{10}{299}$$

$$(A + B)'s 1 \text{ day's work} = \frac{1}{23} + \frac{10}{299} = \frac{23}{299} = \frac{1}{13}$$

Therefore, A and B together can complete the work in 13 days.

13.Ravi and Kumar are working on an assignment. Ravi takes 6 hours to type 32 pages on a computer, while Kumar takes 5 hours to type 40 pages. How much time will they take, working together on two different computers to type an assignment of 110 pages?

Answer: 8 hours 15 minutes

Explanation:

$$\text{Number of pages typed by Ravi in 1 hour} = \frac{32}{6} = \frac{16}{3}$$

$$\text{Number of pages typed by Kumar in 1 hour} = \frac{40}{5} = 8$$

$$\text{Number of pages typed by both in 1 hour} = \frac{16}{3} + 8 = \frac{40}{3}$$

$$\text{Time taken by both to type 110 pages} = \frac{110}{\frac{40}{3}} = \frac{33}{4} \text{ hours}$$

$$= 8\frac{1}{4} \text{ hours (or) 8 hours 15 minutes.}$$

14.A, B and C can complete a piece of work in 24, 6 and 12 days respectively. Working together, they will complete the same work in:

$$\text{Answer: } \frac{3}{7} \text{ days.}$$

Explanation:

Formula: If A can do a piece of work in n days, then A's 1 day's work = $\frac{1}{n}$.

$$(A + B + C)'s \text{ 1 day's work} = \frac{1}{24} + \frac{1}{6} + \frac{1}{12} = \frac{7}{24}$$

Formula: If A's 1 day's work = $\frac{1}{n}$, then A can finish the work in n days.

$$\text{So, all the three together will complete the job in } \frac{24}{7} = 3\frac{3}{7} \text{ days.}$$

15. Sakshi can do a piece of work in 20 days. Tanya is 25% more efficient than Sakshi. The number of days taken by Tanya to do the same piece of work is:

Answer: 16 days

Explanation:

Ratio of times taken by Sakshi and Tanya = 125 : 100 = 5 : 4.

Suppose Tanya takes x days to do the work.

$$4 \times 20$$

$$5 : 4 :: 20 : x \quad x = 5$$

$$x = 16 \text{ days.}$$

Hence, Tanya takes 16 days to complete the work.

16. A takes twice as much time as B or thrice as much time as C to finish a piece of work.

Working together, they can finish the work in 2 days. B can do the work alone in:

Answer: 6 days

Explanation:

Suppose A, B and C take $\frac{x}{2}$ and $\frac{x}{3}$ days respectively to finish the work.

$$\text{Then, } \frac{1}{x} + \frac{2}{x} + \frac{3}{x} = \frac{1}{2}$$

$$\frac{6}{x} = \frac{1}{2}$$

$$x = 12.$$

So, B takes $(12/2) = 6$ days to finish the work.

17. A and B can complete a work in 15 days and 10 days respectively. They started doing the work together but after 2 days B had to leave and A alone completed the remaining work. The whole work was completed in :

Answer: 12 days

Explanation:

$$(A + B)'s \text{ 1 day's work} = \frac{1}{15} + \frac{1}{10} = \frac{1}{6}$$

$$\text{Work done by A and B in 2 days} = \frac{1}{6} \times 2 = \frac{1}{3}$$

$$\text{Remaining work} = 1 - \frac{1}{3} = \frac{2}{3}$$

Now, 1 work is done by A in 1 day.

$$15 \\ 2 \\ 3 \\ \text{work will be done by A in } \frac{15}{2} = 10 \text{ days.}$$

Hence, the total time taken = $(10 + 2) = 12$ days.

18. A and B can do a piece of work in 30 days, while B and C can do the same work in 24 days and C and A in 20 days. They all work together for 10 days when B and C leave. How many days more will A take to finish the work?

Answer: 18 days

Explanation:

$$2(A + B + C)'s \text{ 1 day's work} = \frac{1}{30} + \frac{1}{24} + \frac{1}{20} = \frac{15}{120} = \frac{1}{8}$$

$$\text{Therefore, } (A + B + C)'s \text{ 1 day's work} = \frac{1}{2 \times 8} = \frac{1}{16}$$

$$\text{Work done by A, B, C in 10 days} = \frac{10}{16} = \frac{5}{8}$$

$$\text{Remaining work} = 1 - \frac{5}{8} = \frac{3}{8}$$

$$A's \text{ 1 day's work} = \frac{1}{16} - \frac{1}{24} = \frac{1}{48}$$

Now, $\frac{1}{48}$ work is done by A in 1 day.

$$So, \frac{3}{8} \text{ work will be done by A in } 48 \times \frac{3}{8} = 18 \text{ days.}$$

19. A works twice as fast as B. If B can complete a work in 12 days independently, the number of days in which A and B can together finish the work is :

Answer: 4 days

Explanation:

Ratio of rates of working of A and B = 2 : 1.

So, ratio of times taken = 1 : 2.

$$B's \text{ 1 day's work} = \frac{1}{12}$$

$$A's \text{ 1 day's work} = \frac{1}{6} \text{ (2 times of B's work)}$$

$$(A + B)'s \text{ 1 day's work} = \frac{1}{6} + \frac{1}{12} = \frac{3}{12} = \frac{1}{4}$$

So, A and B together can finish the work in 4 days.

20. Twenty women can do a work in sixteen days. Sixteen men can complete the same work in fifteen days. What is the ratio between the capacity of a man and a woman?

Answer: 4:3

Explanation:

(20×16) women can complete the work in 1 day.
1 .

(16 x 15) men can complete the work in 1 day.

$$\text{1 man's 1 day's work} = \frac{1}{240}$$

$$\text{So, required ratio} = \frac{1}{240} : \frac{1}{320}$$

$$= \frac{1}{3} : \frac{1}{4}$$

= 4 : 3 (cross multiplied)

21.A can do a work in 15 days and B in 20 days. If they work on it together for 4 days, then the fraction of the work that is left is :

Answer: $\frac{8}{15}$

Explanation:

$$\text{A's 1 day's work} = \frac{1}{15};$$

$$\text{B's 1 day's work} = \frac{1}{20};$$

$$(\text{A} + \text{B})'s \text{ 1 day's work} = \frac{1}{15} + \frac{1}{20} = \frac{7}{60}.$$

$$(\text{A} + \text{B})'s \text{ 4 day's work} = \frac{7}{60} \times 4 = \frac{7}{15}.$$

$$\text{Therefore, Remaining work} = 1 - \frac{7}{15} = \frac{8}{15}.$$

22.A can lay railway track between two given stations in 16 days and B can do the same job in 12 days. With help of C, they did the job in 4 days only. Then, C alone can do the job in:

Answer: $\frac{3}{5}$

Explanation:

$$(\text{A} + \text{B} + \text{C})'s \text{ 1 day's work} = \frac{1}{4},$$

$$\text{A's 1 day's work} = \frac{1}{16},$$

$$\text{B's 1 day's work} = \frac{1}{12},$$

$$\text{C's 1 day's work} = \frac{1}{4} - \frac{1}{16} - \frac{1}{12} = \frac{1}{48}.$$

So, C alone can do the work in $\frac{48}{5} = 9\frac{3}{5}$ days.

23.A, B and C can do a piece of work in 20, 30 and 60 days respectively. In how many days can A do the work if he is assisted by B and C on every third day?

Answer: 15days

Explanation:

$$\text{A's 2 day's work} = \frac{1}{20} \times 2 = \frac{1}{10}.$$

$$(\text{A} + \text{B} + \text{C})'s \text{ 1 day's work} = \frac{1}{20} + \frac{1}{30} + \frac{1}{60} = \frac{6}{60} = \frac{1}{10}.$$

$$\text{Work done in 3 days} = \frac{1}{10} + \frac{1}{10} = \frac{1}{5}.$$

Now, $\frac{1}{5}$ work is done in 3 days.

Whole work will be done in $(3 \times 5) = 15$ days.

24.A is thrice as good as workman as B and therefore is able to finish a job in 60 days less than B. Working together, they can do it in:

Answer: $\frac{1}{22}$

Explanation:

Ratio of times taken by A and B = 1 : 3.

The time difference is $(3 - 1) 2$ days while B take 3 days and A takes 1 day.

If difference of time is 2 days, B takes 3 days.

$$\text{If difference of time is 60 days, B takes } \frac{3}{2} \times 60 = 90 \text{ days.}$$

So, A takes 30 days to do the work.

$$\text{A's 1 day's work} = \frac{1}{30}$$

$$\text{B's 1 day's work} = \frac{1}{90}$$

$$(\text{A} + \text{B})'s \text{ 1 day's work} = \frac{1}{30} + \frac{1}{90} = \frac{4}{90} = \frac{2}{45}$$

A and B together can do the work in $\frac{45}{2} = 22\frac{1}{2}$ days.

25.A alone can do a piece of work in 6 days and B alone in 8 days. A and B undertook to do it for Rs. 3200. With the help of C, they completed the work in 3 days. How much is to be paid to C?

Answer: Rs.400

Explanation:

$$\text{C's 1 day's work} = \frac{1}{3} - \frac{1}{6} - \frac{1}{8} = \frac{1}{24}.$$

$$\text{A's wages : B's wages : C's wages} = \frac{1}{6} : \frac{1}{8} : \frac{1}{24} = 4 : 3 : 1.$$

$$\text{C's share (for 3 days)} = \text{Rs. } \frac{3}{24} \times 3200 = \text{Rs. } 400.$$

PROBLEMS ON AGES

1.A is two years older than B who is twice as old as C. If the total of the ages of A, B and C be 27, the how old is B?

Answer: 10years

Explanation:

Let C's age be x years. Then, B's age = $2x$ years. A's age = $(2x + 2)$ years.

$$(2x + 2) + 2x + x = 27$$

$$5x = 25$$

$$x = 5.$$

Hence, B's age = $2x = 10$ years.

2.A man is 24 years older than his son. In two years, his age will be twice the age of his son. The present age of his son is:

Answer: 22years

Explanation:

Let the son's present age be x years. Then, man's present age = $(x + 24)$ years.

$$(x + 24) + 2 = 2(x + 2)$$

$$x + 26 = 2x + 4$$

$$x = 22.$$

3.Six years ago, the ratio of the ages of Kunal and Sagar was 6 : 5. Four years hence, the ratio of their ages will be 11 : 10. What is Sagar's age at present?

Answer: 16years

Explanation:

Let the ages of Kunal and Sagar 6 years ago be $6x$ and $5x$ years respectively.

$$\text{Then, } \frac{(6x + 6) + 4}{(5x + 6) + 4} = \frac{11}{10}$$

$$10(6x + 10) = 11(5x + 10)$$

$$5x = 10$$

$$x = 2.$$

Sagar's present age = $(5x + 6) = 16$ years.

4.The sum of the present ages of a father and his son is 60 years. Six years ago, father's age was five times the age of the son. After 6 years, son's age will be:

Answer: 20years

Explanation:

Let the present ages of son and father be x and $(60 - x)$ years respectively.

$$\text{Then, } (60 - x) - 6 = 5(x - 6)$$

$$54 - x = 5x - 30$$

$$6x = 84$$

$$x = 14.$$

Son's age after 6 years = $(x + 6) = 20$ years..

5.At present, the ratio between the ages of Arun and Deepak is 4 : 3. After 6 years, Arun's age will be 26 years. What is the age of Deepak at present ?

Answer: 15years

Explanation:

Let the present ages of Arun and Deepak be $4x$ years and $3x$ years respectively. Then,

$$\begin{aligned} 4x + 6 &= 26 & 4x &= 20 \\ x &= 5. \end{aligned}$$

Deepak's age = $3x = 15$ years.

6.Sachin is younger than Rahul by 7 years. If their ages are in the respective ratio of 7 : 9, how old is Sachin?

Answer: 24.5years

Explanation:

Let Rahul's age be x years.

Then, Sachin's age = $(x - 7)$ years.

$$\frac{x - 7}{x} = \frac{7}{9}$$

$$9x - 63 = 7x$$

$$2x = 63$$

$$x = 31.5$$

Hence, Sachin's age = $(x - 7) = 24.5$ years.

7.The present ages of three persons in proportions 4 : 7 : 9. Eight years ago, the sum of their ages was 56. Find their present ages (in years).

Answer: 16 years, 28 years, 36 years.

Explanation:

Let their present ages be $4x$, $7x$ and $9x$ years respectively.

$$\text{Then, } (4x - 8) + (7x - 8) + (9x - 8) = 56$$

$$20x = 80$$

$$x = 4.$$

Their present ages are $4x = 16$ years, $7x = 28$ years and $9x = 36$ years respectively.

8. Ayesha's father was 38 years of age when she was born while her mother was 36 years old when her brother four years younger to her was born. What is the difference between the ages of her parents?

Answer: 6 years

Explanation:

Mother's age when Ayesha's brother was born = 36 years.

Father's age when Ayesha's brother was born = $(38 + 4)$ years = 42 years.

$$\text{Required difference} = (42 - 36) \text{ years} = 6 \text{ years.}$$

9. A person's present age is two-fifth of the age of his mother. After 8 years, he will be one-half of the age of his mother. How old is the mother at present?

Answer: 40 years

Explanation:

Let the mother's present age be x years.

$$\text{Then, the person's present age} = \frac{2}{5}x \text{ years.}$$

$$\frac{2}{5}x + 8 = \frac{1}{2}(x + 8)$$

$$2(2x + 40) = 5(x + 8)$$

$$x = 40.$$

10. Q is as much younger than R as he is older than T. If the sum of the ages of R and T is 50 years, what is definitely the difference between R and Q's age?

Answer: Cannot be determined.

Explanation:

$$R - Q = R - T \quad Q = T.$$

$$\text{Also, } R + T = 50 \quad R + Q = 50.$$

So, $(R - Q)$ cannot be determined.

11. The age of father 10 years ago was thrice the age of his son. Ten years hence, father's age will be twice that of his son. The ratio of their present ages is:

Answer: 7:3

Explanation:

Let the ages of father and son 10 years ago be $3x$ and x years respectively.

$$\text{Then, } (3x + 10) + 10 = 2[(x + 10) + 10]$$

$$3x + 20 = 2x + 40$$

$$x = 20.$$

$$\text{Required ratio} = (3x + 10) : (x + 10) = 70 : 30 = 7 : 3.$$

12. A is two years older than B who is twice as old as C. If the total of the ages of A, B and C be 27, the how old is B?

Answer: 10 years

Explanation:

Let C's age be x years. Then, B's age = $2x$ years. A's age = $(2x + 2)$ years.

$$(2x + 2) + 2x + x = 27$$

$$5x = 25$$

$$x = 5.$$

Hence, B's age = $2x = 10$ years.

13. Father is aged three times more than his son Ronit. After 8 years, he would be two and a half times of Ronit's age. After further 8 years, how many times would he be of Ronit's age?

Answer: 2

Explanation:

Let Ronit's present age be x years. Then, father's present age = $(x + 3x)$ years = $4x$ years.

$$\frac{5}{2}(x + 8) = \frac{5}{2}(x + 8)$$

$$8x + 16 = 5x + 40$$

$$3x = 24$$

$$x = 8.$$

$$\text{Hence, required ratio} = \frac{(4x + 16)}{(x + 16)} = \frac{48}{24} = 2.$$

14. The sum of ages of 5 children born at the intervals of 3 years each is 50 years. What is the age of the youngest child?

Answer: 4 years

Explanation:

Let the ages of children be x , $(x+3)$, $(x+6)$, $(x+9)$ and $(x+12)$ years.

$$\text{Then, } x + (x+3) + (x+6) + (x+9) + (x+12) = 50$$

$$5x = 20$$

$$x = 4.$$

Age of the youngest child = $x = 4$ years.

15. A father said to his son, "I was as old as you are at the present at the time of your birth". If the father's age is 38 years now, the son's age five years back was:

Answer: 14 years

Explanation:

Let the son's present age be x years. Then, $(38 - x) = x$

$$2x = 38.$$

$$x = 19.$$

Son's age 5 years back $(19 - 5) = 14$ years.

16. Present ages of Sameer and Anand are in the ratio of 5 : 4 respectively. Three years hence, the ratio of their ages will become 11 : 9 respectively. What is Anand's present age in years?

Answer: 24 years

Explanation:

Let the present ages of Sameer and Anand be $5x$ years and $4x$ years respectively.

$$\text{Then, } \frac{5x+3}{4x+3} = \frac{11}{9}$$

$$9(5x+3) = 11(4x+3)$$

$$45x + 27 = 44x + 33$$

$$45x - 44x = 33 - 27$$

$$x = 6.$$

Anand's present age = $4x = 24$ years.

ALLIGATION OR MIXTURE

1. A milk vendor has 2 cans of milk. The first contains 25% water and the rest milk. The second contains 50% water. How much milk should he mix from each of the containers so as to get 12 litres of milk such that the ratio of water to milk is 3 : 5

Answer: 6 litres

Explanation:

Let the cost of 1 litre milk be Re. 1

Milk in 1 litre mix. in 1st can = $\frac{3}{4}$ litre, C.P. of 1 litre mix. in 1st can Re. $\frac{3}{4}$

Milk in 1 litre mix. in 2nd can = $\frac{1}{2}$ litre, C.P. of 1 litre mix. in 2nd can Re. $\frac{1}{2}$

Milk in 1 litre of final mix. = $\frac{5}{8}$ litre, Mean price = Re. $\frac{5}{8}$

By the rule of alligation, we have:

C.P. of 1 litre mixture in 1st can C.P. of 1 litre mixture in 2nd can

3	Mean Price	1
4		2
1		1
8		8

$\frac{1}{3} : \frac{1}{5} = 1 : 1$
Ratio of two mixtures = $\frac{1}{8} : \frac{1}{8} = 1 : 1$.

So, quantity of mixture taken from each can = $\frac{1}{2} \times 12 = 6$ litres.

2. In what ratio must a grocer mix two varieties of pulses costing Rs. 15 and Rs. 20 per kg respectively so as to get a mixture worth Rs. 16.50 kg?

Answer: 7:3

Explanation:

By the rule of alligation:

Cost of 1 kg pulses of 1st kind Cost of 1 kg pulses of 2nd kind

Rs. 15	Mean Price	Rs. 20
3.50		1.50

Required rate = $3.50 : 1.50 = 7 : 3$.

3. A container contains 40 litres of milk. From this container 4 litres of milk was taken out and replaced by water. This process was repeated further two times. How much milk is now contained by the container?

Answer: 29.16 litres

Explanation:

$$\begin{aligned} \text{Amount of milk left after 3 operations} &= 40 \times \left(1 - \frac{4}{40}\right)^3 \\ &= 40 \times 9 \times 9 \times 9 = 29.16 \text{ litres.} \end{aligned}$$

10 10 10

4.A jar full of whisky contains 40% alcohol. A part of this whisky is replaced by another containing 19% alcohol and now the percentage of alcohol was found to be 26%. The quantity of whisky replaced is:

Answer: 2/3

Explanation:

By the rule of alligation, we have:

Strength of first jar Strength of 2nd jar

40%	Mean	19%
-----	------	-----

Strength	
----------	--

7	26%	14
---	-----	----

So, ratio of 1st and 2nd quantities = 7 : 14 = 1 : 2

2

Required quantity replaced = 3

5.In what ratio must water be mixed with milk to gain 16(2/3)% on selling the mixture at cost price?

Answer: 1:6

Explanation:

Let C.P. of 1 litre milk be Re. 1.

S.P. of 1 litre of mixture = Re.1, Gain = $\frac{50}{3}\%$.

C.P. of 1 litre of mixture = $100 \times \frac{3}{350} \times 1 = \frac{6}{7}$

By the rule of alligation, we have:

C.P. of 1 litre of water C.P. of 1 litre of milk

0	Mean Price	Re. 1
1	Re. $\frac{6}{7}$	6
7		7

Ratio of water and milk = $\frac{1}{6} : \frac{7}{7} = 1 : 6$.

6.Find the ratio in which rice at Rs. 7.20 a kg be mixed with rice at Rs. 5.70 a kg to produce a mixture worth Rs. 6.30 a kg.

Answer: 2:3

Explanation:

By the rule of alligation:

Cost of 1 kg of 1st kind Cost of 1 kg of 2nd kind

720 p	Mean Price	570 p
60	630 p	90

Required ratio = 60 : 90 = 2 : 3.

7.In what ratio must a grocer mix two varieties of tea worth Rs. 60 a kg and Rs. 65 a kg so that by selling the mixture at Rs. 68.20 a kg he may gain 10%?

Answer: 3:2

Explanation:

S.P. of 1 kg of the mixture = Rs. 68.20, Gain = 10%.

C.P. of 1 kg of the mixture = Rs. $\frac{100}{110} \times 68.20 = \text{Rs. } 62$.

By the rule of alligation, we have:

Cost of 1 kg tea of 1st kind. Cost of 1 kg tea of 2nd kind.

Rs. 60	Mean Price	Rs. 65
3	Rs. 62	2

Required ratio = 3 : 2.

8.The cost of Type 1 rice is Rs. 15 per kg and Type 2 rice is Rs. 20 per kg. If both Type 1 and Type 2 are mixed in the ratio of 2 : 3, then the price per kg of the mixed variety of rice is:

Answer: 18

Explanation:

Let the price of the mixed variety be Rs. x per kg.

By rule of alligation, we have:

Cost of 1 kg of Type 1 rice Cost of 1 kg of Type 2 rice

Rs. 15	Mean Price	Rs. 20
(20 - x)	Rs. x	(x - 15)
$(20 - x) = 2$		
$(x - 15) = 3$		

$$60 - 3x = 2x - 30$$

$$5x = 90$$

$$x = 18.$$

9.8 litres are drawn from a cask full of wine and is then filled with water. This operation is performed three more times. The ratio of the quantity of wine now left in cask to that of water is 16 : 81. How much wine did the cask hold originally?

Answer: 24

Explanation:

Let the quantity of the wine in the cask originally be x litres.

Then, quantity of wine left in cask after 4 operations = $x \times \frac{8}{9} \times \frac{8}{9} \times \frac{8}{9} \times \frac{8}{9} = \frac{8}{9}^4 x$ litres.

$$\frac{x(1 - (8/9)^4)}{x} = \frac{16}{81}$$

$$1 - \frac{8}{9}^4 = \frac{2}{3}^4$$

$$\begin{array}{rcl} x - 8 & & 2 \\ & x & = 3 \end{array}$$

$$3x - 24 = 2x$$

$$x = 24.$$

10.A merchant has 1000 kg of sugar, part of which he sells at 8% profit and the rest at 18% profit. He gains 14% on the whole. The quantity sold at 18% profit is:

Answer: 600kg

Explanation:

By the rule of alligation, we have:

Profit on 1st part Profit on 2nd part

8% Mean Profit 18%

4 14% 6

Ration of 1st and 2nd parts = 4 : 6 = 2 : 3

$$\text{Quantity of 2nd kind} = \frac{3}{5} \times 1000 \text{ kg} = 600 \text{ kg.}$$

11.A vessel is filled with liquid, 3 parts of which are water and 5 parts syrup. How much of the mixture must be drawn off and replaced with water so that the mixture may be half water and half syrup?

Answer: 1/5

Explanation:

Suppose the vessel initially contains 8 litres of liquid.

Let x litres of this liquid be replaced with water.

$$\text{Quantity of water in new mixture} = \frac{3x}{8} + x \text{ litres}$$

$$\text{Quantity of syrup in new mixture} = 5 - \frac{5x}{8} \text{ litres}$$

$$\frac{3x}{8} + x = 5 - \frac{5x}{8}$$

$$5x + 24 = 40 - 5x$$

$$\begin{array}{rcl} 10x = 16 \\ 8 \\ x = 5 \end{array}$$

$$\text{So, part of the mixture replaced} = \frac{8}{5} \times \frac{1}{8} = \frac{1}{5}$$

12.Tea worth Rs. 126 per kg and Rs. 135 per kg are mixed with a third variety in the ratio 1 : 1 :

2. If the mixture is worth Rs. 153 per kg, the price of the third variety per kg will be:

Answer: 175.50

Explanation:

Since first and second varieties are mixed in equal proportions.

$$\text{So, their average price} = \text{Rs. } \frac{126 + 135}{2} = \text{Rs. } 130.50$$

So, the mixture is formed by mixing two varieties, one at Rs. 130.50 per kg and the other at say, Rs. x per kg in the ratio 2 : 2, i.e., 1 : 1. We have to find x .

By the rule of alligation, we have:

Cost of 1 kg of 1st kind Cost of 1 kg tea of 2nd kind

Rs. 130.50 Mean Price Rs. x

(x - 153) Rs. 153 22.50

$$\frac{x - 153}{22.50} = 1$$

$$x - 153 = 22.50$$

$$x = 175.50$$

13.A can contains a mixture of two liquids A and B is the ratio 7 : 5. When 9 litres of mixture are drawn off and the can is filled with B, the ratio of A and B becomes 7 : 9. How many litres of liquid A was contained by the can initially?

Answer: 21litres

Explanation:

Suppose the can initially contains $7x$ and $5x$ of mixtures A and B respectively.

$$\text{Quantity of A in mixture left} = \frac{7}{12}x \cdot 9 \text{ litres} = \frac{21}{4}x \text{ litres.}$$

$$\text{Quantity of B in mixture left} = \frac{5}{12}x \cdot 9 \text{ litres} = \frac{15}{4}x \text{ litres.}$$

$$\begin{array}{rcl} \frac{21}{4} & & 7 \\ \frac{15}{4} & = & 9 \\ + 9 & & \\ \hline 28x - 21 & 7 \\ 20x + 21 & 9 \end{array}$$

$$252x - 189 = 140x + 147$$

$$112x = 336$$

$$x = 3.$$

So, the can contained 21 litres of A.

14.A dishonest milkman professes to sell his milk at cost price but he mixes it with water and thereby gains 25%. The percentage of water in the mixture is:

Answer: 20%

Explanation:

Let C.P. of 1 litre milk be Re. 1

Then, S.P. of 1 litre of mixture = Re. 1, Gain = 25%.

$$\text{C.P. of 1 litre mixture} = \text{Re. } \frac{100}{125} \times 1 = \frac{4}{5}$$

By the rule of alligation, we have:

C.P. of 1 litre of milk C.P. of 1 litre of water

Re. 1	Mean Price	0
4		1
5	Re. 5	5

$$\text{Ratio of milk to water} = \frac{4}{5} : \frac{1}{5} = 4 : 1.$$

$$\text{Hence, percentage of water in the mixture} = \frac{1}{5} \times 100 \% = 20\%.$$

15. How many kilogram of sugar costing Rs. 9 per kg must be mixed with 27 kg of sugar costing Rs. 7 per kg so that there may be a gain of 10% by selling the mixture at Rs. 9.24 per kg?

Answer: 63kg

Explanation:

S.P. of 1 kg of mixture = Rs. 9.24, Gain 10%.

$$\text{C.P. of 1 kg of mixture} = \text{Rs. } \frac{100}{110} \times 9.24 = \text{Rs. } 8.40$$

By the rule of alligation, we have:

C.P. of 1 kg sugar of 1st kind Cost of 1 kg sugar of 2nd kind

Rs. 9	Mean Price	Rs. 7
1.40		Rs. 8.40

Ratio of quantities of 1st and 2nd kind = 14 : 6 = 7 : 3.

Let x kg of sugar of 1st be mixed with 27 kg of 2nd kind.

Then, 7 : 3 = x : 27

$$x = \frac{7 \times 27}{3} = 63 \text{ kg.}$$

CHAIN RULE

.1. A man completes $\frac{5}{8}$ of a job in 10 days. At this rate, how many more days will it takes him to finish the job?

Answer: 6days

Explanation:

Work done = 5

8

$$\text{Balance work} = 1 - \frac{5}{8} = \frac{3}{8}$$

Let the required number of days be x .

$$\text{Then, } \frac{5}{8} : \frac{3}{8} :: 10 : x \quad \frac{5}{8} \times x = \frac{3}{8} \times 10 \\ x = \frac{3}{8} \times 10 \times \frac{8}{5}$$

$$x = 6.$$

2. If a quarter kg of potato costs 60 paise, how many paise will 200 gm cost?

Answer: 48

Explanation:

Let the required weight be x kg.

Less weight, Less cost (Direct Proportion)

$$250 : 200 :: 60 : x \quad 250 \times x = (200 \times 60) \\ (200 \times 60)$$

$$x = 250$$

$$x = 48.$$

3. In a dairy farm, 40 cows eat 40 bags of husk in 40 days. In how many days one cow will eat one bag of husk?

Answer: 40

Explanation:

Let the required number of days be x .

Less cows, More days (Indirect Proportion)

Less bags, Less days (Direct Proportion)

$$\text{Cows } 1:40 \quad :: 40 : x \\ \text{Bags } 40:1$$

$$1 \times 40 \times x = 40 \times 1 \times 40$$

$$x = 40.$$

4. A wheel that has 6 cogs is meshed with a larger wheel of 14 cogs. When the smaller wheel has made 21 revolutions, then the number of revolutions mad by the larger wheel is:

Answer: 9

Explanation:

Let the required number of revolutions made by larger wheel be x .

Then, *More cogs, Less revolutions (Indirect Proportion)*

$$\frac{14}{6} : \frac{6}{21} :: \frac{21}{x}$$

$$14 \times x = 6 \times 21$$

$$6 \times 21$$

$$x = 14$$

$$x = 9.$$

5. If 7 spiders make 7 webs in 7 days, then 1 spider will make 1 web in how many days?

Answer: 7

Explanation:

Let the required number days be x .

Less spiders, More days (Indirect Proportion)

Less webs, Less days (Direct Proportion)

$$\begin{array}{lcl} \text{Spiders} & 1:7 & :: 7:x \\ \text{Webs} & 7:1 & \end{array}$$

$$1 \times 7 \times x = 7 \times 1 \times 7$$

$$x = 7.$$

6. A flagstaff 17.5 m high casts a shadow of length 40.25 m. The height of the building, which casts a shadow of length 28.75 m under similar conditions will be:

Answer: 12.5

Explanation:

Let the height of the building x metres.

Less lengthy shadow, Less in the height (Direct Proportion)

$$\frac{40.25}{28.75} : \frac{28.75}{17.5} :: \frac{17.5}{x}$$

$$40.25 \times x = 28.75 \times 17.5$$

$$28.75 \times 17.5$$

$$x = 40.25$$

$$x = 12.5$$

7. In a camp, there is a meal for 120 men or 200 children. If 150 children have taken the meal, how many men will be catered to with remaining meal?

Answer: 30men

Explanation:

There is a meal for 200 children. 150 children have taken the meal.
Remaining meal is to be catered to 50 children.

$$\begin{array}{ll} \text{Now, } 200 \text{ children} & 120 \text{ men.} \\ \text{50 children} & \frac{120}{200} \times 50 = 30 \text{ men.} \end{array}$$

8. An industrial loom weaves 0.128 metres of cloth every second. Approximately, how many seconds will it take for the loom to weave 25 metres of cloth?

Answer: 195sec(approx)

Explanation:

Let the required time be x seconds.

More metres, More time (Direct Proportion)

$$\frac{0.128}{25} : \frac{25}{1000} :: \frac{1}{x}$$

$$0.128 \times x = 25 \times 1$$

$$x = \frac{25}{0.128} = \frac{25 \times 1000}{128}$$

$$x = 195.31.$$

Required time = 195 sec (approximately).

9. 36 men can complete a piece of work in 18 days. In how many days will 27 men complete the same work?

Answer: 24

Explanation:

Let the required number of days be x .

Less men, More days (Indirect Proportion)

$$\frac{27}{36} : \frac{36}{18} :: \frac{18}{x}$$

$$27 \times x = 36 \times 18$$

$$36 \times 18$$

$$x = 27$$

$$x = 24.$$

10. 4 mat-weavers can weave 4 mats in 4 days. At the same rate, how many mats would be woven by 8 mat-weavers in 8 days?

Answer: 16

Explanation:

Let the required number of bottles be x .

More weavers, More mats (Direct Proportion)

More days, More mats (Direct Proportion)

$$\begin{array}{l} \text{Wavers 4:8} \\ \text{Days 4:8} \end{array} :: 4 : x$$

$$\begin{aligned} 4 \times 4 \times x &= 8 \times 8 \times 4 \\ (8 \times 8 \times 4) \\ x &= (4 \times 4) \end{aligned}$$

$$x = 16.$$

11.3 pumps, working 8 hours a day, can empty a tank in 2 days. How many hours a day must 4 pumps work to empty the tank in 1 day?

Answer: 12

Explanation:

Let the required number of working hours per day be x .

More pumps, Less working hours per day (Indirect Proportion)

Less days, More working hours per day (Indirect Proportion)

$$\begin{array}{l} \text{Pumps 4:3} \\ \text{Days 1:2} \end{array} :: 8 : x$$

$$\begin{aligned} 4 \times 1 \times x &= 3 \times 2 \times 8 \\ (3 \times 2 \times 8) \\ x &= (4) \end{aligned}$$

$$x = 12.$$

12. If the cost of x metres of wire is d rupees, then what is the cost of y metres of wire at the same rate?

Answer: Rs. yd/x

Explanation:

Cost of x metres = Rs. d .

Cost of 1 metre = Rs. $\frac{d}{x}$

Cost of y metres = Rs. $\frac{d}{x} \times y = \text{Rs. } \frac{yd}{x}$.

13. Running at the same constant rate, 6 identical machines can produce a total of 270 bottles per minute. At this rate, how many bottles could 10 such machines produce in 4 minutes?

Answer: 1800

Explanation:

Let the required number of bottles be x .

More machines, More bottles (Direct Proportion)

More minutes, More bottles (Direct Proportion)

$$\begin{array}{l} \text{Machines 6:10} \\ \text{Time (in minutes) 1:4} \end{array} :: 270 : x$$

$$\begin{aligned} 6 \times 1 \times x &= 10 \times 4 \times 270 \\ (10 \times 4 \times 270) \\ x &= (6) \end{aligned}$$

$$x = 1800.$$

14. A fort had provision of food for 150 men for 45 days. After 10 days, 25 men left the fort. The number of days for which the remaining food will last, is:

Answer: 42

Explanation:

After 10 days : 150 men had food for 35 days.

Suppose 125 men had food for x days.

Now, *Less men, More days (Indirect Proportion)*

$$\begin{array}{l} 125 : 150 :: 35 : x \\ 150 \times 35 \\ x = 125 \end{array}$$

$$x = 42.$$

15. 39 persons can repair a road in 12 days, working 5 hours a day. In how many days will 30 persons, working 6 hours a day, complete the work?

Answer: 13

Explanation:

Let the required number of days be x .

Less persons, More days (Indirect Proportion)

More working hours per day, Less days (Indirect Proportion)

$$\begin{array}{l} \text{Persons 30:39} \\ \text{Working hours/day 6:5} \end{array} :: 12 : x$$

$$\begin{aligned} 30 \times 6 \times x &= 39 \times 5 \times 12 \\ (39 \times 5 \times 12) \\ x &= (30 \times 6) \end{aligned}$$

$$x = 13.$$

SIMPLE INTEREST

220

1. A sum of Rs. 12,500 amounts to Rs. 15,500 in 4 years at the rate of simple interest. What is the rate of interest?

Answer: 6%

Explanation:

$$S.I. = \text{Rs. } (15500 - 12500) = \text{Rs. } 3000.$$

$$\text{Rate} = \frac{100 \times 3000}{12500 \times 4} = 6\%$$

2. A person takes a loan of Rs. 200 at 5% simple interest. He returns Rs. 100 at the end of 1 year.

In order to clear his dues at the end of 2 years, he would pay:

Answer: Rs.115

Explanation:

$$\text{Amount to be paid} = \text{Rs. } 100 + \frac{200 \times 5 \times 1}{100} + \frac{100 \times 5 \times 1}{100} \\ = \text{Rs. } 115.$$

3. An automobile financier claims to be lending money at simple interest, but he includes the interest every six months for calculating the principal. If he is charging an interest of 10%, the effective rate of interest becomes:

Answer: 10.25%

Explanation:

Let the sum be Rs. 100. Then,

$$S.I. \text{ for first 6 months} = \text{Rs. } \frac{100 \times 10 \times 1}{100 \times 2} = \text{Rs. } 5$$

$$S.I. \text{ for last 6 months} = \text{Rs. } \frac{105 \times 10 \times 1}{100 \times 2} = \text{Rs. } 5.25$$

So, amount at the end of 1 year = Rs. $(100 + 5 + 5.25)$ = Rs. 110.25

$$\text{Effective rate} = (110.25 - 100) = 10.25\%$$

4. A lent Rs. 5000 to B for 2 years and Rs. 3000 to C for 4 years on simple interest at the same rate of interest and received Rs. 2200 in all from both of them as interest. The rate of interest per annum is:

Answer: 10%

Explanation:

Let the rate be R% p.a.

$$\text{Then, } \frac{5000 \times R \times 2}{100} + \frac{3000 \times R \times 4}{100} = 2200.$$

$$100R + 120R = 2200 \\ 2200 = 10.$$

$$\text{Rate} = 10\%.$$

5. A sum of Rs. 725 is lent in the beginning of a year at a certain rate of interest. After 8 months, a sum of Rs. 362.50 more is lent but at the rate twice the former. At the end of the year, Rs. 33.50 is earned as interest from both the loans. What was the original rate of interest?

Answer: 3.46%

Explanation:

Let the original rate be R%. Then, new rate = $(2R)\%$.

Note:

Here, original rate is for 1 year(s); the new rate is for only 4 months i.e. year(s).

$$\frac{725 \times R \times 1}{100} + \frac{362.50 \times 2R \times 1}{100 \times 3} = 33.50$$

$$(2175 + 725) R = 33.50 \times 100 \times 3$$

$$(2175 + 725) R = 10050$$

$$(2900)R = 10050 \\ 10050 = 3.46 \\ R = 2900$$

$$\text{Original rate} = 3.46\%$$

6. A man took loan from a bank at the rate of 12% p.a. simple interest. After 3 years he had to pay Rs. 5400 interest only for the period. The principal amount borrowed by him was:

Answer: Rs.15000

Explanation:

$$\text{Principal} = \text{Rs. } \frac{100 \times 5400}{12 \times 3} = \text{Rs. } 15000.$$

7. A sum of money amounts to Rs. 9800 after 5 years and Rs. 12005 after 8 years at the same rate of simple interest. The rate of interest per annum is:

Answer: 12%

Explanation:

$$S.I. \text{ for 3 years} = \text{Rs. } (12005 - 9800) = \text{Rs. } 2205.$$

$$S.I. \text{ for 5 years} = \text{Rs. } \frac{2205}{3} \times 5 = \text{Rs. } 3675$$

$$\text{Principal} = \text{Rs. } (9800 - 3675) = \text{Rs. } 6125.$$

$$\text{Hence, rate} = \frac{100 \times 3675}{6125 \times 5} \% = 12\%$$

8. What will be the ratio of simple interest earned by certain amount at the same rate of interest for 6 years and that for 9 years?

Answer: 2:3

Explanation:

Let the principal be P and rate of interest be R%.

$$\text{Required ratio} = \frac{P \times R \times 6}{P \times R \times 9} = \frac{6PR}{9PR} = \frac{2}{3} = 2 : 3.$$

9. A certain amount earns simple interest of Rs. 1750 after 7 years. Had the interest been 2% more, how much more interest would it have earned?

Answer: Data is Inadequate

Explanation:

We need to know the S.I., principal and time to find the rate.

Since the principal is not given, so data is inadequate.

10. A person borrows Rs. 5000 for 2 years at 4% p.a. simple interest. He immediately lends it to another person at $6\frac{1}{2}$ p.a for 2 years. Find his gain in the transaction per year.

Answer: Rs.112.50

Explanation:

$$\begin{aligned} \text{Gain in 2 years} &= \text{Rs. } 5000 \times \frac{25}{4} \times \frac{2}{100} - \frac{5000 \times 4 \times 2}{100} \\ &= \text{Rs. } (625 - 400) \\ &= \text{Rs. } 225. \end{aligned}$$

$$\text{Gain in 1 year} = \text{Rs. } \frac{225}{2} = \text{Rs. } 112.50$$

11. A sum of money at simple interest amounts to Rs. 815 in 3 years and to Rs. 854 in 4 years.

The sum is:

Answer: Rs.698

Explanation:

S.I. for 1 year = Rs. $(854 - 815)$ = Rs. 39.

S.I. for 3 years = Rs. (39×3) = Rs. 117.

Principal = Rs. $(815 - 117)$ = Rs. 698.

12. Mr. Thomas invested an amount of Rs. 13,900 divided in two different schemes A and B at the simple interest rate of 14% p.a. and 11% p.a. respectively. If the total amount of simple interest earned in 2 years be Rs. 3508, what was the amount invested in Scheme B?

Answer: Rs.6400

Explanation:

Let the sum invested in Scheme A be Rs. x and that in Scheme B be Rs. $(13900 - x)$.

$$\text{Then, } \frac{x \times 14 \times 2}{100} + \frac{(13900 - x) \times 11 \times 2}{100} = 3508$$

$$28x - 22x = 350800 - (13900 \times 22)$$

$$6x = 45000$$

$$x = 7500.$$

So, sum invested in Scheme B = Rs. $(13900 - 7500)$ = Rs. 6400.

13. A sum fetched a total simple interest of Rs. 4016.25 at the rate of 9 p.c.p.a. in 5 years. What is the sum?

Answer: Rs. 8925

Explanation:

$$\begin{aligned} \text{Principal} &= \text{Rs. } \frac{100 \times 4016.25}{9 \times 5} \\ &= \text{Rs. } \frac{401625}{45} \\ &= \text{Rs. } 8925. \end{aligned}$$

14. How much time will it take for an amount of Rs. 450 to yield Rs. 81 as interest at 4.5% per annum of simple interest?

Answer: 4years

Explanation:

$$\text{Time} = \frac{100 \times 81}{450 \times 4.5} = 4 \text{ years.}$$

15. Reena took a loan of Rs. 1200 with simple interest for as many years as the rate of interest. If she paid Rs. 432 as interest at the end of the loan period, what was the rate of interest?

Answer: 6**Explanation:**

Let rate = R% and time = R years.

$$\text{Then, } \frac{1200 \times R \times R}{100} = 432$$

$$12R^2 = 432$$

$$R^2 = 36$$

$$R = 6.$$

COMPOUND INTEREST

1. What will be the compound interest on a sum of Rs. 25,000 after 3 years at the rate of 12 p.c.p.a.?

Answer: Rs. 10123.20**Explanation:**

$$\begin{aligned} \text{Amount} &= \text{Rs. } 25000 \times 1 + \frac{12}{100}^3 \\ &= \text{Rs. } 25000 \times \frac{28}{25} \times \frac{28}{25} \times \frac{28}{25} \\ &= \text{Rs. } 35123.20 \end{aligned}$$

$$\text{C.I.} = \text{Rs. } (35123.20 - 25000) = \text{Rs. } 10123.20$$

2. At what rate of compound interest per annum will a sum of Rs. 1200 become Rs. 1348.32 in 2 years?

Answer: 6%**Explanation:**

Let the rate be R% p.a.

$$\begin{aligned} \text{Then, } 1200 \times 1 + \frac{R}{100}^2 &= 1348.32 \\ 1 + \frac{R}{100}^2 &= \frac{134832}{120000} = \frac{11236}{10000} \end{aligned}$$

$$\begin{array}{rcl} 1 + \frac{R}{100} & 2 = & \frac{106}{100} & 2 \\ R & \frac{106}{100} & & \\ 1 + \frac{R}{100} & \frac{106}{100} & & \end{array}$$

$$R = 6\%$$

3. The least number of complete years in which a sum of money put out at 20% compound interest will be more than doubled is:

Answer: 4 yrs**Explanation:**

$$P \quad 1 + \frac{20}{100}^n > 2P \quad \begin{array}{c} 6 \\ 5 \end{array} \quad n > 2.$$

$$\text{Now, } \frac{6}{5} \times \frac{6}{5} \times \frac{6}{5} > 2.$$

$$\text{So, } n = 4 \text{ years.}$$

4. Albert invested an amount of Rs. 8000 in a fixed deposit scheme for 2 years at compound interest rate 5 p.c.p.a. How much amount will Albert get on maturity of the fixed deposit?

Answer: Rs. 8820**Explanation:**

$$\begin{aligned} \text{Amount} &= \text{Rs. } 8000 \times 1 + \frac{5}{100}^2 \\ &= \text{Rs. } 8000 \times \frac{21}{20} \times \frac{21}{20} \\ &= \text{Rs. } 8820. \end{aligned}$$

5. The effective annual rate of interest corresponding to a nominal rate of 6% per annum payable half-yearly is:

Answer: 6.09%**Explanation:**

$$\text{Amount of Rs. } 100 \text{ for 1 year} \quad \begin{array}{c} 3 \\ 100 \end{array} \quad 2 = \text{Rs. } 100 \times 1 + \frac{3}{100}^2 = \text{Rs. } 106.09$$

$$\text{Effective rate} = (106.09 - 100)\% = 6.09\%$$

6. Simple interest on a certain sum of money for 3 years at 8% per annum is half the compound interest on Rs. 4000 for 2 years at 10% per annum. The sum placed on simple interest is:

Answer: Rs. 1750**Explanation:**

$$\text{C.I.} = \text{Rs. } 4000 \times 1 + \frac{10}{100}^2 - 4000$$

$$= \text{Rs. } 4000 \times \frac{11}{10} \times \frac{11}{10} - 4000$$

= Rs. 840.

$$420 \times 100$$

$$\text{Sum} = \text{Rs. } 3 \times 8$$

$$= \text{Rs. } 1750.$$

7. If the simple interest on a sum of money for 2 years at 5% per annum is Rs. 50, what is the compound interest on the same at the same rate and for the same time?

Answer: Rs.51.25

Explanation:

$$\text{Sum} = \text{Rs. } \frac{50 \times 100}{2 \times 5} = \text{Rs. } 500.$$

$$\text{Amount} = \text{Rs. } 500 \times 1 + \frac{5}{100}^2$$

$$= \text{Rs. } 500 \times \frac{21}{20} \times \frac{21}{20}$$

$$= \text{Rs. } 551.25$$

$$\text{C.I.} = \text{Rs. } (551.25 - 500) = \text{Rs. } 51.25$$

8. The difference between simple interest and compound on Rs. 1200 for one year at 10% per annum reckoned half-yearly is:

Answer: Rs.3

Explanation:

$$\text{S.I.} = \text{Rs. } \frac{1200 \times 10 \times 1}{100} = \text{Rs. } 120.$$

$$\text{C.I.} = \text{Rs. } 1200 \times 1 + \frac{5}{100}^2 - 1200 = \text{Rs. } 123.$$

$$\text{Difference} = \text{Rs. } (123 - 120) = \text{Rs. } 3.$$

9. The difference between compound interest and simple interest on an amount of Rs. 15,000 for 2 years is Rs. 96. What is the rate of interest per annum?

Answer: 8%

Explanation:

$$15000 \times 1 + \frac{R}{100}^2 - 15000 - \frac{15000 \times R \times 2}{100} = 96$$

$$15000 \times 1 + \frac{R}{100}^2 - 1 - \frac{2R}{100} = 96$$

$$(100 + R)^2 - 10000 - (200 \times R) = 96$$

$$\begin{aligned} & 96 \times 2 \\ & R^2 = 3 \\ & = 64 \end{aligned}$$

$$R = 8.$$

$$\text{Rate} = 8\%.$$

10. The compound interest on a certain sum for 2 years at 10% per annum is Rs. 525. The simple interest on the same sum for double the time at half the rate percent per annum is:

Answer: Rs.500

Explanation:

Let the sum be Rs. P.

$$\text{Then, } P \times 1 + \frac{10}{100}^2 - P = 525$$

$$P \times \frac{11}{10}^2 - P = 525$$

$$P = \frac{525 \times 100}{21} = 2500.$$

$$\text{Sum} = \text{Rs. } 2500.$$

$$\text{So, S.I.} = \text{Rs. } \frac{2500 \times 5 \times 4}{100} = \text{Rs. } 500$$

11. A bank offers 5% compound interest calculated on half-yearly basis. A customer deposits Rs. 1600 each on 1st January and 1st July of a year. At the end of the year, the amount he would have gained by way of interest is:

Answer: Rs.121

Explanation:

$$\begin{aligned} \text{Amount} &= \text{Rs. } 1600 \times 1 + \frac{5}{2 \times 100}^2 + 1600 \times 1 + \frac{5}{2 \times 100}^2 \\ &= \text{Rs. } 1600 \times \frac{41}{40} \times \frac{41}{40} + 1600 \times \frac{41}{40} \\ &= \text{Rs. } 1600 \times \frac{41}{40} \times \frac{41}{40} + 1 \\ &= \text{Rs. } 1600 \times \frac{41}{40} \times \frac{81}{40} \\ &= \text{Rs. } \frac{1600 \times 41 \times 81}{40 \times 40} \\ &= \text{Rs. } 3321. \end{aligned}$$

$$\text{C.I.} = \text{Rs. } (3321 - 3200) = \text{Rs. } 121$$

12. The difference between simple and compound interests compounded annually on a certain

sum of money for 2 years at 4% per annum is Re. 1. The sum (in Rs.) is:

Answer: Rs.625

Explanation:

Let the sum be Rs. x . Then,

$$\text{C.I.} = x \left(1 + \frac{4}{100}\right)^2 - x = \frac{676}{625}x - x = \frac{51}{625}x.$$

$$\text{S.I.} = \frac{x \times 4 \times 2}{100} = \frac{2x}{25}$$

$$\frac{51x}{625} - \frac{2x}{25} = 1$$

$$x = 625.$$

13. There is 60% increase in an amount in 6 years at simple interest. What will be the compound interest of Rs. 12,000 after 3 years at the same rate?

Answer: 3972

Explanation:

Let P = Rs. 100. Then, S.I. Rs. 60 and T = 6 years.

$$\frac{100 \times 60}{100 \times 6} = 10\% \text{ p.a.}$$

Now, P = Rs. 12000. T = 3 years and R = 10% p.a.

$$\begin{aligned} \text{C.I.} &= \text{Rs. } 12000 \times \left(1 + \frac{10}{100}\right)^3 - 1 \\ &= \text{Rs. } 12000 \times \frac{331}{1000} \\ &= 3972. \end{aligned}$$

14.

What is the difference between the compound interests on Rs. 5000 for $1\frac{1}{2}$ years at 4% per annum compounded yearly and half-yearly?

Answer: Rs.2.04

Explanation:

C.I. when

$$\begin{aligned} \text{interest} &= \text{Rs. } 5000 \times \left(1 + \frac{4}{100}\right)^2 - 1 \\ \text{compounded yearly} &= \text{Rs. } 5000 \times \frac{26}{25} \times \frac{51}{50} \\ &= \text{Rs. } 5304. \end{aligned}$$

$$\begin{aligned} \text{C.I. when interest is} &= \text{Rs. } 5000 \times \left(1 + \frac{2}{100}\right)^3 - 1 \\ \text{compounded half-yearly} &= \text{Rs. } 1000 \times 392 = \text{Rs. } 320 \end{aligned}$$

$$\begin{aligned} &= \text{Rs. } 5000 \times \frac{51}{50} \times \frac{51}{50} \times \frac{51}{50} \\ &= \text{Rs. } 5306.04 \end{aligned}$$

$$\text{Difference} = \text{Rs. } (5306.04 - 5304) = \text{Rs. } 2.04$$

15. The compound interest on Rs. 30,000 at 7% per annum is Rs. 4347. The period (in years) is:

Answer: 2yrs

Explanation:

$$\text{Amount} = \text{Rs. } (30000 + 4347) = \text{Rs. } 34347.$$

Let the time be n years.

$$\begin{aligned} \text{Then, } 30000 \times \left(1 + \frac{7}{100}\right)^n &= 34347 \\ \frac{107}{100}^n &= \frac{34347}{30000} = \frac{11449}{10000} \\ n &= \sqrt{\frac{11449}{10000}} = \frac{107}{100} = 2 \end{aligned}$$

$$n = 2 \text{ years.}$$

PROFIT AND LOSS

1.The percentage profit earned by selling an article for Rs. 1920 is equal to the percentage loss incurred by selling the same article for Rs. 1280. At what price should the article be sold to make 25% profit?

Answer: Rs.2000

Explanation:

Let C.P. be Rs. x .

$$\text{Then, } \frac{1920 - x}{x} \times 100 = \frac{x - 1280}{x} \times 100$$

$$1920 - x = x - 1280$$

$$2x = 3200$$

$$x = 1600$$

$$\begin{aligned} \text{Required S.P.} &= 125\% \text{ of Rs. } 1600 = \text{Rs. } \frac{125}{100} \times 1600 \\ &= \text{Rs. } 2000. \end{aligned}$$

2. A shopkeeper expects a gain of 22.5% on his cost price. If in a week, his sale was of Rs. 392, what was his profit?

Answer: Rs.72

Explanation:

$$\text{C.P.} = \text{Rs. } \frac{100}{122.5} \times 392 = \text{Rs. } 1000 \times 392 = \text{Rs. } 320$$

122.5

1225

12

$$\text{Profit} = \text{Rs. } (392 - 320) = \text{Rs. } 72.$$

3. A man buys a cycle for Rs. 1400 and sells it at a loss of 15%. What is the selling price of the cycle?

Answer: Rs.1190

Explanation:

$$\text{S.P.} = 85\% \text{ of Rs. } 1400 = \text{Rs. } \frac{85}{100} \times 1400 = \text{Rs. } 1190$$

4. Sam purchased 20 dozens of toys at the rate of Rs. 375 per dozen. He sold each one of them at the rate of Rs. 33. What was his percentage profit?

Answer: 5.6%

Explanation:

$$\text{Cost Price of 1 toy} = \text{Rs. } \frac{375}{12} = \text{Rs. } 31.25$$

$$\text{Selling Price of 1 toy} = \text{Rs. } 33$$

$$\text{So, Gain} = \text{Rs. } (33 - 31.25) = \text{Rs. } 1.75$$

$$\text{Profit \%} = \frac{1.75}{31.25} \times 100 = \frac{28}{5}\% = 5.6\%$$

5. Some articles were bought at 6 articles for Rs. 5 and sold at 5 articles for Rs. 6. Gain percent is:

Answer: 44%

Explanation:

Suppose, number of articles bought = L.C.M. of 6 and 5 = 30.

$$\text{C.P. of 30 articles} = \text{Rs. } \frac{5}{6} \times 30 = \text{Rs. } 25.$$

$$\text{S.P. of 30 articles} = \text{Rs. } \frac{6}{5} \times 30 = \text{Rs. } 36.$$

$$\text{Gain \%} = \frac{11}{25} \times 100 \% = 44\%.$$

6. On selling 17 balls at Rs. 720, there is a loss equal to the cost price of 5 balls. The cost price of a ball is:

Answer: Rs.60

Explanation:

$$(\text{C.P. of 17 balls}) - (\text{S.P. of 17 balls}) = (\text{C.P. of 5 balls})$$

$$\text{C.P. of 12 balls} = \text{S.P. of 17 balls} = \text{Rs. } 720.$$

$$720 = \text{Rs. } 60.$$

7. When a plot is sold for Rs. 18,700, the owner loses 15%. At what price must that plot be sold in order to gain 15%?

Answer: Rs.25,300

Explanation:

$$85 : 18700 = 115 : x$$

$$x = \frac{85}{115} \times 18700 = 25300.$$

Hence, S.P. = Rs. 25,300.

8. 100 oranges are bought at the rate of Rs. 350 and sold at the rate of Rs. 48 per dozen. The percentage of profit or loss is:

Answer: 14(2/7)%

Explanation:

$$\text{C.P. of 1 orange} = \text{Rs. } \frac{350}{100} = \text{Rs. } 3.50$$

$$\text{S.P. of 1 orange} = \text{Rs. } \frac{48}{12} = \text{Rs. } 4$$

$$\text{Gain \%} = \frac{0.50}{3.50} \times 100 \% = \frac{100}{7}\% = 14\frac{2}{7}\%$$

9. A shopkeeper sells one transistor for Rs. 840 at a gain of 20% and another for Rs. 960 at a loss of 4%. His total gain or loss percent is:

Answer: 5

Explanation:

$$\text{C.P. of 1st transistor} = \text{Rs. } \frac{100}{120} \times 840 = \text{Rs. } 700.$$

$$\text{C.P. of 2nd transistor} = \text{Rs. } \frac{100}{96} \times 960 = \text{Rs. } 1000$$

$$\text{So, total C.P.} = \text{Rs. } (700 + 1000) = \text{Rs. } 1700.$$

$$\text{Total S.P.} = \text{Rs. } (840 + 960) = \text{Rs. } 1800.$$

$$\text{Gain \%} = \frac{100}{1700} \times 100 \% = 5\frac{15}{17}\%$$

10. A trader mixes 26 kg of rice at Rs. 20 per kg with 30 kg of rice of other variety at Rs. 36 per kg and sells the mixture at Rs. 30 per kg. His profit percent is:

Answer: 5%

Explanation:

$$\text{C.P. of 56 kg rice} = \text{Rs. } (26 \times 20 + 30 \times 36) = \text{Rs. } (520 + 1080) = \text{Rs. } 1600.$$

$$\text{S.P. of 56 kg rice} = \text{Rs. } (56 \times 30) = \text{Rs. } 1680.$$

$$80 \times 100$$

3. Two friends P and Q started a business investing in the ratio of 5 : 6. R joined them after six months investing an amount equal to that of Q's. At the end of the year, 20% profit was earned which was equal to Rs. 98,000. What was the amount invested by R?

Answer: Rs.210000

Explanation:

Let the total profit be Rs. x .

$$\text{Then, } 20\% \text{ of } x = 98000 \quad x = 20 \quad = 490000.$$

Let the capitals of P, Q and R be Rs. $5x$, Rs. $6x$ and Rs. $6x$ respectively.

$$\text{Then, } (5x \times 12) + (6x \times 12) + (6x \times 6) = 490000 \times 12$$

$$\begin{aligned} 168x &= 490000 \times 12 \\ 490000 \times 12 &= 35000. \\ x &= 168 \end{aligned}$$

$$\text{R's investment} = 6x = \text{Rs. } (6 \times 35000) = \text{Rs. } 210000.$$

4. A and B started a partnership business investing some amount in the ratio of 3 : 5. C joined then after six months with an amount equal to that of B. In what proportion should the profit at the end of one year be distributed among A, B and C?

Answer: 6:10:5

Explanation:

Let the initial investments of A and B be $3x$ and $5x$.

$$A : B : C = (3x \times 12) : (5x \times 12) : (5x \times 6) = 36 : 60 : 30 = 6 : 10 : 5.$$

5. A, B, C rent a pasture. A puts 10 oxen for 7 months, B puts 12 oxen for 5 months and C puts 15 oxen for 3 months for grazing. If the rent of the pasture is Rs. 175, how much must C pay as his share of rent?

Answer: Rs.45

Explanation:

$$A : B : C = (10 \times 7) : (12 \times 5) : (15 \times 3) = 70 : 60 : 45 = 14 : 12 : 9.$$

$$\begin{aligned} 175 \times \frac{9}{35} &= \text{Rs. } 45. \\ \text{C's rent} &= \text{Rs. } 45. \end{aligned}$$

6.A and B started a business in partnership investing Rs. 20,000 and Rs. 15,000 respectively. After six months, C joined them with Rs. 20,000. What will be B's share in total profit of Rs. 25,000 earned at the end of 2 years from the starting of the business?

Answer: Rs.7500

Explanation:

$$A : B : C = (20,000 \times 24) : (15,000 \times 24) : (20,000 \times 18) = 4 : 3 : 3.$$

$$25000 \times \frac{3}{10} = \text{Rs. } 7,500.$$

7. A began a business with Rs. 85,000. He was joined afterwards by B with Rs. 42,500. For how much period does B join, if the profits at the end of the year are divided in the ratio of 3 : 1?

Answer: 8 months

Explanation:

Suppose B joined for x months. Then,

$$\begin{aligned} \text{Then, } \frac{85000 \times 12}{42500 \times x} &= \frac{3}{1} \\ \frac{85000 \times 12}{42500 \times 3} &= 8. \\ x &= \frac{42500 \times 3}{85000 \times 12} \end{aligned}$$

So, B joined for 8 months.

8. Aman started a business investing Rs. 70,000. Rakhi joined him after six months with an amount of Rs. 1,05,000 and Sagar joined them with Rs. 1.4 lakhs after another six months. The amount of profit earned should be distributed in what ratio among Aman, Rakhi and Sagar respectively, 3 years after Aman started the business?

Answer: 12:15:16

Explanation:

$$\text{Aman : Rakhi : Sagar} = (70,000 \times 36) : (1,05,000 \times 30) : (1,40,000 \times 24) = 12 : 15 : 16.$$

9. Arun, Kamal and Vinay invested Rs. 8000, Rs. 4000 and Rs. 8000 respectively in a business. Arun left after six months. If after eight months, there was a gain of Rs. 4005, then what will be the share of Kamal?

Answer: Rs.890

Explanation:

$$\begin{aligned} \text{Arun : Kamal : Vinay} &= (8,000 \times 6) : (4,000 \times 8) : (8,000 \times 8) \\ &= 48 : 32 : 64 \\ &= 3 : 2 : 4. \end{aligned}$$

$$\text{Kamal's share} = \text{Rs. } \frac{4005 \times 2}{9} = \text{Rs. } 890.$$

10. Simran started a software business by investing Rs. 50,000. After six months, Nanda joined her with a capital of Rs. 80,000. After 3 years, they earned a profit of Rs. 24,500. What was Simran's share in the profit?

Answer: Rs.10500

Explanation:

$$\text{Simran : Nanda} = (50000 \times 36) : (80000 \times 30) = 3 : 4.$$

$$\text{Simran's share} = \text{Rs. } \frac{24500 \times 3}{7} = \text{Rs. } 10,500.$$

11. A and B invest in a business in the ratio 3 : 2. If 5% of the total profit goes to charity and A's share is Rs. 855, the total profit is:

Answer: 1500

Explanation:

Let the total profit be Rs. 100.

$$\text{After paying to charity, A's share} = \text{Rs. } 95 \times \frac{3}{5} = \text{Rs. } 57.$$

If A's share is Rs. 57, total profit = Rs. 100.

$$\text{If A's share Rs. 855, total profit} = \frac{100}{57} \times 855 = 1500.$$

12. A, B and C jointly thought of engaging themselves in a business venture. It was agreed that A would invest Rs. 6500 for 6 months, B, Rs. 8400 for 5 months and C, Rs. 10,000 for 3 months. A wants to be the working member for which, he was to receive 5% of the profits. The profit earned was Rs. 7400. Calculate the share of B in the profit.

Answer: Rs.2660

Explanation:

For managing, A received = 5% of Rs. 7400 = Rs. 370.

Balance = Rs. (7400 - 370) = Rs. 7030.

Ratio of their investments = $(6500 \times 6) : (8400 \times 5) : (10000 \times 3)$

$$= 39000 : 42000 : 30000$$

$$= 13 : 14 : 10$$

$$\text{B's share} = \text{Rs. } 7030 \times \frac{14}{37} = \text{Rs. } 2660.$$

13. A, B and C enter into a partnership in the ratio 7/2:4/3:6/5. After 4 months, A increases his share 50%. If the total profit at the end of one year be Rs. 21,600, then B's share in the profit is:

Answer: Rs.4000

Explanation:

Ratio of initial investments = $\frac{7}{2} : \frac{4}{3} : \frac{6}{5} = 105 : 40 : 36$.

Let the initial investments be $105x$, $40x$ and $36x$.

$$\begin{aligned} A : B : C &= \frac{105}{100}x : \frac{4}{100}x : \frac{105}{100}x \times 8 : (40x \times 12) : (36x \times 12) \\ &= 1680x : 480x : 432x = 35 : 10 : 9. \end{aligned}$$

$$\text{Hence, B's share} = \text{Rs. } 21600 \times \frac{10}{54} = \text{Rs. } 4000.$$

14. A, B, C subscribe Rs. 50,000 for a business. A subscribes Rs. 4000 more than B and B Rs. 5000 more than C. Out of a total profit of Rs. 35,000, A receives:

Answer: Rs.14,700

Explanation:

Let C = x.

Then, B = $x + 5000$ and A = $x + 5000 + 4000 = x + 9000$.

So, $x + x + 5000 + x + 9000 = 50000$

$$3x = 36000$$

$$x = 12000$$

$$A : B : C = 21000 : 17000 : 12000 = 21 : 17 : 12.$$

$$\text{A's share} = \text{Rs. } 35000 \times \frac{21}{50} = \text{Rs. } 14,700.$$

15. Three partners shared the profit in a business in the ratio 5 : 7 : 8. They had partnered for 14 months, 8 months and 7 months respectively. What was the ratio of their investments?

Answer: 20:49:64

Explanation:

Let their investments be Rs. x for 14 months, Rs. y for 8 months and Rs. z for 7 months respectively.

$$\text{Then, } 14x : 8y : 7z = 5 : 7 : 8.$$

$$\begin{aligned} \text{Now, } \frac{14x}{8y} &= \frac{5}{7} & 98x &= 40y & y &= 20x \\ \text{And, } \frac{14x}{7z} &= \frac{5}{8} & 112x &= 35z & z &= \frac{16}{5}x \\ x : y : z &= x : 20 : 5 & x &= 20 : 49 : 64. \end{aligned}$$

PERCENTAGE

1.If 20% of $a = b$, then $b\%$ of 20 is the same as:

Answer: 4% of a

Explanation:

$$\begin{aligned} 20\% \text{ of } a &= b \\ \frac{20}{100}a &= b. \end{aligned}$$

$$b\% \text{ of } 20 = \frac{b}{100} \times 20 = \frac{20}{100}a \times \frac{1}{100} \times 20 = \frac{4}{100}a = 4\% \text{ of } a.$$

2. In a certain school, 20% of students are below 8 years of age. The number of students above 8

years of age is _____ of the number of students of 8 years of age which is 48. What is the total number of students in the school?

Answer: 100

Explanation:

Let the number of students be x . Then,

$$\text{Number of students above 8 years of age} = (100 - 20)\% \text{ of } x = 80\% \text{ of } x.$$

$$80\% \text{ of } x = 48 + 3$$

$$\frac{80}{100}x = 80$$

$$x = 100.$$

3. Two numbers A and B are such that the sum of 5% of A and 4% of B is two-third of the sum of 6% of A and 8% of B. Find the ratio of A : B.

Answer: 4:3

Explanation:

$$5\% \text{ of } A + 4\% \text{ of } B = \frac{2}{3} (6\% \text{ of } A + 8\% \text{ of } B)$$

$$\frac{5}{100}A + \frac{4}{100}B = \frac{2}{3} \left(\frac{6}{100}A + \frac{8}{100}B \right)$$

$$\frac{1}{20}A + \frac{1}{25}B = \frac{1}{25}A + \frac{4}{75}B$$

$$\begin{array}{rcl} 1 & 1 & \\ 20 & 25 & \\ \hline A = & 75 & 25 \\ & 1 & 1 \\ & 25 & 25 \end{array}$$

$$\frac{1}{100}A = \frac{1}{75}B$$

$$\begin{array}{rcl} A & 100 & 4 \\ B & 75 & 3 \end{array}$$

$$\text{Required ratio} = 4 : 3$$

4. A student multiplied a number by $\frac{3}{5}$ instead of $\frac{5}{3}$.

What is the percentage error in the calculation?

Answer: 64%

Explanation:

Let the number be x .

$$\text{Then, error} = \frac{5}{3}x - \frac{3}{5}x = \frac{16}{15}x$$

$$\text{Error \%} = \frac{\frac{16}{15}x}{x} \times 100 \% = 64\%.$$

5. In an election between two candidates, one got 55% of the total valid votes, 20% of the votes were invalid. If the total number of votes was 7500, the number of valid votes that the other

candidate got, was:

Answer: 2700

Explanation:

$$\text{Number of valid votes} = 80\% \text{ of } 7500 = 6000.$$

$$\text{Valid votes polled by other candidate} = 45\% \text{ of } 6000$$

$$= \frac{45}{100} \times 6000 = 2700.$$

6. Three candidates contested an election and received 1136, 7636 and 11628 votes respectively.

What percentage of the total votes did the winning candidate get?

Answer: 57%

Explanation:

$$\text{Total number of votes polled} = (1136 + 7636 + 11628) = 20400.$$

$$\text{Required percentage} = \frac{11628}{20400} \times 100 \% = 57\%.$$

7. Two tailors X and Y are paid a total of Rs. 550 per week by their employer. If X is paid 120 percent of the sum paid to Y, how much is Y paid per week?

Answer: 250

Explanation:

Let the sum paid to Y per week be Rs. z .

$$\text{Then, } z + 120\% \text{ of } z = 550.$$

$$\frac{120}{z+100}z = 550$$

$$\frac{11}{5}z = 550$$

$$550 \times 5$$

$$z = 11 = 250.$$

8. Gauri went to the stationers and bought things worth Rs. 25, out of which 30 paise went on sales tax on taxable purchases. If the tax rate was 6%, then what was the cost of the tax free items?

Answer: Rs. 19.70

Explanation:

Let the amount taxable purchases be Rs. x .

$$\text{Then, } 6\% \text{ of } x = \frac{30}{100}$$

$$x = \frac{30}{100} \times \frac{x}{6} = 5.$$

$$\text{Cost of tax free items} = \text{Rs. } [25 - (5 + 0.30)] = \text{Rs. } 19.70$$

9. Rajeev buys good worth Rs. 6650. He gets a rebate of 6% on it. After getting the rebate, he pays sales tax @ 10%. Find the amount he will have to pay for the goods.

Answer: Rs.6876.10

Explanation:

$$\text{Rebate} = 6\% \text{ of Rs. } 6650 = \text{Rs. } \frac{6}{100} \times 6650 = \text{Rs. } 399.$$

$$\text{Sales tax} = 10\% \text{ of Rs. } (6650 - 399) = \text{Rs. } \frac{10}{100} \times 6251 = \text{Rs. } 625.10$$

$$\text{Final amount} = \text{Rs. } (6251 + 625.10) = \text{Rs. } 6876.10$$

10. The population of a town increased from 1,75,000 to 2,62,500 in a decade. The average percent increase of population per year is:

Answer: 5%

Explanation:

$$\text{Increase in 10 years} = (262500 - 175000) = 87500.$$

$$\text{Increase\%} = \frac{87500}{175000} \times 100 = 50\%.$$

$$\text{Required average} = \frac{50}{10} \% = 5\%.$$

11. A batsman scored 110 runs which included 3 boundaries and 8 sixes. What percent of his total score did he make by running between the wickets?

Answer: 45(5/11)%

Explanation:

$$\text{Number of runs made by running} = 110 - (3 \times 4 + 8 \times 6)$$

$$= 110 - (60)$$

$$= 50.$$

$$\text{Required percentage} = \frac{50}{110} \times 100 \% = \frac{5}{11} \% = 45\frac{5}{11} \%.$$

12. Two students appeared at an examination. One of them secured 9 marks more than the other and his marks was 56% of the sum of their marks. The marks obtained by them are:

Answer: 42&33

Explanation:

Let their marks be $(x+9)$ and x .

$$\text{Then, } x+9 = \frac{56}{100} (x+9+x)$$

$$25(x+9) = 14(2x+9)$$

$$3x = 99$$

$$x = 33$$

So, their marks are 42 and 33.

13. A fruit seller had some apples. He sells 40% apples and still has 420 apples. Originally, he had:

Answer: 700

Explanation:

Suppose originally he had x apples.

$$\text{Then, } (100 - 40)\% \text{ of } x = 420.$$

$$\frac{60}{100} x = 420$$

$$420 \times 100$$

$$x = \frac{60}{100} \times 420 = 700.$$

14. What percentage of numbers from 1 to 70 have 1 or 9 in the unit's digit?

Answer: 20%

Explanation:

Clearly, the numbers which have 1 or 9 in the unit's digit, have squares that end in the digit

1. Such numbers from 1 to 70 are 1, 9, 11, 19, 21, 29, 31, 39, 41, 49, 51, 59, 61, 69.

Number of such number = 14

$$\text{Required percentage} = \frac{14}{70} \times 100 \% = 20\%.$$

15. If $A = x\%$ of y and $B = y\%$ of x , then which of the following is true?

Answer: A=B

Explanation:

$$x\% \text{ of } y = \frac{x}{100} \times y = \frac{y}{100} \times x = y\% \text{ of } x$$

$$A = B.$$

TRUE DISCOUNT

1. Goods were bought for Rs. 600 and sold the same for Rs. 688.50 at a credit of 9 months and thus gaining 2% The rate of interest per annum is:

Answer: 16%

Explanation:

$$\text{S.P.} = 102\% \text{ of Rs. } 600 = \frac{102}{100} \times 600 = \text{Rs. } 612.$$

Now, P.W. = Rs. 612 and sum = Rs. 688.50.

T.D. = Rs. (688.50 - 612) = Rs. 76.50.

Thus, S.I. on Rs. 612 for 9 months is Rs. 76.50.

$$100 \times 76.50$$

$$\text{Rate} = \frac{612 \times \frac{3}{4}}{100} \quad \% = 16 \quad \%$$

2. The true discount on a bill due 9 months hence at 16% per annum is Rs. 189. The amount of the bill is:

Answer: Rs.1764

Explanation:

Let P.W. be Rs. x .

Then, S.I. on Rs. x at 16% for 9 months = Rs. 189.

$$\frac{9}{12} \times \frac{x}{100} = 189 \text{ or } x = 1575.$$

P.W. = Rs. 1575.

Sum due = P.W. + T.D. = Rs. (1575 + 189) = Rs. 1764.

3. A man buys a watch for Rs. 1950 in cash and sells it for Rs. 2200 at a credit of 1 year. If the rate of interest is 10% per annum, the man:

Answer: Rs.50

Explanation:

S.P.= P.W. of Rs. 2200 due 1 year hence

$$\begin{aligned} &= \frac{2200 \times 100}{100 + (10 \times 1)} \\ &= \text{Rs. } 2000. \end{aligned}$$

Gain = Rs. (2000 - 1950) = Rs. 50.

4. The true discount on Rs. 1760 due after a certain time at 12% per annum is Rs. 160. The time after which it is due is:

Answer: 10months

Explanation:

P.W. = Rs. (1760 - 160) = Rs. 1600.

S.I. on Rs. 1600 at 12% is Rs. 160.

$$\text{Time} = \frac{100 \times 160}{1600 \times 12} = \frac{5}{6} \text{ years} = \frac{5}{6} \times 12 \text{ months} = 10 \text{ months.}$$

5.

The present worth of Rs. 2310 due 2 years hence, the rate of interest being 15% per annum, is:

Answer: Rs.1680

Explanation:

$$\text{P.W.} = \text{Rs. } \frac{100 \times 2310}{100 + \frac{5}{2}} = \text{Rs. } 1680.$$

6.Rs. 20 is the true discount on Rs. 260 due after a certain time. What will be the true discount on the same sum due after half of the former time, the rate of interest being the same?

Answer: Rs.10.40

Explanation:

S.I. on Rs. (260 - 20) for a given time = Rs. 20.

S.I. on Rs. 240 for half the time = Rs. 10.

T.D. on Rs. 250 = Rs. 10.

$$\text{T.D. on Rs. } 260 = \text{Rs. } \frac{10}{250} \times 260 = \text{Rs. } 10.40$$

7. The interest on Rs. 750 for 2 years is the same as the true discount on Rs. 960 due 2 years hence. If the rate of interest is the same in both cases, it is:

Answer: 14%

Explanation:

S.I. on Rs. 750 = T.D. on Rs. 960.

This means P.W. of Rs. 960 due 2 years hence is Rs. 750.

T.D. = Rs. (960 - 750) = Rs. 210.

Thus, S.I. on Rs 750 for 2 years is Rs. 210.

$$\text{Rate} = \frac{100 \times 210}{750 \times 2} = 14\%$$

8. The simple interest and the true discount on a certain sum for a given time and at a given rate are Rs. 85 and Rs. 80 respectively. The sum is:

Answer: Rs.1360

Explanation:

$$\text{Sum} = \frac{\text{S.I.} \times \text{T.D.}}{(\text{S.I.}) - (\text{T.D.})} = \frac{85 \times 80}{(85 - 80)} = \text{Rs. } 1360.$$

9. The present worth of Rs. 1404 due in two equal half-yearly installments at 8% per annum simple interest is:

Answer: Rs.1325

Explanation:

Required sum= P.W. of Rs. 702 due 6 months + P.W. of Rs. 702 due 1 year hence

$$\begin{aligned}
 & 100 \times 702 \\
 = \text{Rs.} & + 100 \times 702 \\
 & 100 + 8x \\
 = \text{Rs.} & (675 + 650) \\
 = \text{Rs.} & 1325.
 \end{aligned}$$

10. If the true discount on a sum due 2 years hence at 14% per annum be Rs. 168, the sum due is:

Answer: Rs.768

Explanation:

$$P.W. = \frac{100 \times T.D.}{R \times T} = \frac{100 \times 168}{14 \times 2} = 600.$$

$$\text{Sum} = (P.W. + T.D.) = \text{Rs.} (600 + 168) = \text{Rs.} 768.$$

11. A man purchased a cow for Rs. 3000 and sold it the same day for Rs. 3600, allowing the buyer a credit of 2 years. If the rate of interest be 10% per annum, then the man has a gain of:

Answer: 0%

Explanation:

C.P. = Rs. 3000.

$$S.P. = \text{Rs.} \frac{3600 \times 100}{100 + (10 \times 2)} = \text{Rs.} 3000.$$

Gain = 0%.

12. The true discount on Rs. 2562 due 4 months hence is Rs. 122. The rate percent is:

Answer: 15%

Explanation:

$$P.W. = \text{Rs.} (2562 - 122) = \text{Rs.} 2440.$$

S.I. on Rs. 2440 for 4 months is Rs. 122.

$$Rate = \frac{100 \times 122}{2440 \times \frac{1}{3}} \% = 15\%.$$

13. A trader owes a merchant Rs. 10,028 due 1 year hence. The trader wants to settle the account after 3 months. If the rate of interest 12% per annum, how much cash should he pay?

Answer: Rs.9200

Explanation:

Required money= P.W. of Rs. 10028 due 9 months hence

$$\begin{aligned}
 & 10028 \times 100 \\
 = \text{Rs.} & 100 + 12 \times \frac{9}{12} \\
 & = \text{Rs.} 9200.
 \end{aligned}$$

14. A man wants to sell his scooter. There are two offers, one at Rs. 12,000 cash and the other a credit of Rs. 12,880 to be paid after 8 months, money being at 18% per annum. Which is the better offer?

Answer: Rs.11500

Explanation:

$$\begin{aligned}
 & 12880 \times 100 \\
 P.W. \text{ of Rs.} & 12,880 \text{ due 8 months hence} = \text{Rs.} 100 + 18 \times \frac{8}{12} \\
 & = \text{Rs.} 12880 \times \frac{100}{112} \\
 & = \text{Rs.} 11500.
 \end{aligned}$$

15. If Rs. 10 be allowed as true discount on a bill of Rs. 110 due at the end of a certain time, then the discount allowed on the same sum due at the end of double the time is:

Answer: Rs.18.33

Explanation:

S.I. on Rs. (110 - 10) for a certain time = Rs. 10.

S.I. on Rs. 100 for double the time = Rs. 20.

T.D. on Rs. 120 = Rs. (120 - 100) = Rs. 20.

$$T.D. \text{ on Rs.} 110 = \text{Rs.} \frac{20}{120} \times 110 = \text{Rs.} 18.33$$

RATIO AND PROPORTION

- 1.The ratio of the number of boys and girls in a college is 7 : 8. If the percentage increase in the number of boys and girls be 20% and 10% respectively, what will be the new ratio?

Answer: 21:22

Explanation:

Originally, let the number of boys and girls in the college be $7x$ and $8x$ respectively.

Their increased number is (120% of $7x$) and (110% of $8x$).

$$\frac{120}{100} \times 7x \quad \text{and} \quad \frac{110}{100} \times 8x$$

$$\frac{42x}{5} \text{ and } \frac{44x}{5}$$

$$\frac{42x}{5} : \frac{44x}{5} = 21 : 22.$$

The required ratio =

2. Salaries of Ravi and Sumit are in the ratio 2 : 3. If the salary of each is increased by Rs. 4000, the new ratio becomes 40 : 57. What is Sumit's salary?

Answer: Rs.38000

Explanation:

Let the original salaries of Ravi and Sumit be Rs. $2x$ and Rs. $3x$ respectively.

Then, $2x + 4000 = 40$

$$3x + 4000 = 57$$

$$57(2x + 4000) = 40(3x + 4000)$$

$$6x = 68,000$$

$$3x = 34,000$$

Sumit's present salary = $(3x + 4000)$ = Rs.(34000 + 4000) = Rs. 38,000.

3. If $0.75 : x :: 5 : 8$, then x is equal to:

Answer: 1.20

Explanation:

$$\frac{6}{(x \times 5)} = \frac{1.20}{5}$$

4. The sum of three numbers is 98. If the ratio of the first to second is $2 : 3$ and that of the second to the third is $5 : 8$, then the second number is:

Answer: 30

Explanation:

Let the three parts be A, B, C. Then,

$$A : B = 2 : 3 \text{ and } B : C = 5 : 8 = \frac{5}{5} : \frac{8}{5} = 3 : \frac{24}{5}$$

$$A : B : C = 2 : 3 : \frac{24}{5} = 10 : 15 : 24$$

$$B = \frac{98}{49} \times \frac{15}{49} = 30.$$

5. If Rs. 782 be divided into three parts, proportional to $(1/2) : (2/3) : (3/4)$, then the first part is:

Answer: Rs.204

Explanation:

Given ratio = $(1/2) : (2/3) : (3/4) = 6 : 8 : 9$.

$$1^{\text{st}} \text{ part} = \text{Rs. } \frac{782}{23} \times \frac{6}{23} = \text{Rs. } 204$$

6.The salaries A, B, C are in the ratio $2 : 3 : 5$. If the increments of 15%, 10% and 20% are allowed respectively in their salaries, then what will be new ratio of their salaries?

Answer: 23:33:60

Explanation:

Let $A = 2k$, $B = 3k$ and $C = 5k$.

$$A's \text{ new salary} = \frac{115}{100} \text{ of } 2k = \frac{115}{100} \times 2k = \frac{23k}{10}$$

$$B's \text{ new salary} = 110 \text{ of } 3k = 110 \times 3k = 33k$$

$$\begin{aligned} & \text{C's new salary} = \frac{120}{100} \text{ of } 5k = \frac{120}{100} \times 5k = 6k \\ & \text{New ratio} \quad \frac{23k}{10} : \frac{33k}{10} : 6k = 23 : 33 : 60 \end{aligned}$$

7. If 40% of a number is equal to two-third of another number, what is the ratio of first number to the second number?

Answer: 5:3

Explanation:

$$\text{Let } 40\% \text{ of } A = \frac{2}{3}B$$

$$\text{Then, } \frac{40A}{100} = \frac{2B}{3}$$

$$\frac{2A}{5} = \frac{2B}{3}$$

$$\frac{A}{B} = \frac{3}{5}$$

$$A : B = 5 : 3.$$

8. The fourth proportional to 5, 8, 15 is:

Answer: 24

Explanation:

Let the fourth proportional to 5, 8, 15 be x .

Then, $5 : 8 : 15 : x$

$$5x = (8 \times 15)$$

$$x = \frac{(8 \times 15)}{5} = 24.$$

9. Two number are in the ratio $3 : 5$. If 9 is subtracted from each, the new numbers are in the ratio $12 : 23$. The smaller number is:

Answer: 33

Explanation:

Let the numbers be $3x$ and $5x$.

$$\text{Then, } \frac{3x - 9}{5x - 9} = \frac{12}{23}$$

$$23(3x - 9) = 12(5x - 9)$$

$$9x = 99$$

$x = 11.$

The smaller number = $(3 \times 11) = 33.$

10. In a bag, there are coins of 25 p, 10 p and 5 p in the ratio of 1 : 2 : 3. If there is Rs. 30 in all, how many 5 p coins are there?

Answer: 150

Explanation:

Let the number of 25 p, 10 p and 5 p coins be $x, 2x, 3x$ respectively.

$$\text{Then, sum of their values} = \text{Rs. } \frac{25x}{100} + \frac{10x}{100} + \frac{5x}{100} = \text{Rs. } \frac{60x}{100}$$

$$\frac{60x}{100} = 30 \quad \frac{30 \times 100}{100} = 50. \\ x = 60$$

Hence, the number of 5 p coins = $(3 \times 50) = 150.$

11. A and B together have Rs. 1210. If of A's amount is equal to of B's amount, how much amount does B have?

Answer: Rs.484

Explanation:

$$\frac{4}{15}A = \frac{2}{5}B$$

$$A = \frac{2}{5}B \quad A = \frac{2}{5} \cdot \frac{15}{4}B \\ A = \frac{3}{2}B \quad A = \frac{3}{2} \cdot \frac{2}{3}B \\ A = B$$

$A : B = 3 : 2.$

$$\text{B's share} = \text{Rs. } 1210 \times \frac{2}{5} = \text{Rs. } 484.$$

12. Two numbers are respectively 20% and 50% more than a third number. The ratio of the two numbers is:

Answer: 4:5

Explanation:

Let the third number be $x.$

$$\text{Then, first number} = 120\% \text{ of } x = \frac{120x}{100} = \frac{6x}{5}$$

$$\text{Second number} = 150\% \text{ of } x = \frac{150x}{100} = \frac{3x}{2}$$

$$\text{Ratio of first two numbers} = \frac{6x}{5} : \frac{3x}{2} = 12x : 15x = 4 : 5.$$

13. A sum of money is to be distributed among A, B, C, D in the proportion of 5 : 2 : 4 : 3. If C gets Rs. 1000 more than D, what is B's share?

Answer: Rs.2000

Explanation:

Let the shares of A, B, C and D be Rs. $5x, \text{Rs. } 2x, \text{Rs. } 4x$ and Rs. $3x$ respectively.

$$\text{Then, } 4x - 3x = 1000$$

$$x = 1000.$$

$$\text{B's share} = \text{Rs. } 2x = \text{Rs. } (2 \times 1000) = \text{Rs. } 2000.$$

14. Seats for Mathematics, Physics and Biology in a school are in the ratio 5 : 7 : 8. There is a proposal to increase these seats by 40%, 50% and 75% respectively. What will be the ratio of increased seats?

Answer: 2.3:4

Explanation:

Originally, let the number of seats for Mathematics, Physics and Biology be $5x, 7x$ and $8x$ respectively.

Number of increased seats are (140% of $5x$), (150% of $7x$) and (175% of $8x$).

$$\frac{140}{100}x, \frac{150}{100}x, \frac{175}{100}x \\ 7x, \frac{21}{2}x \text{ and } 14x.$$

$$\text{The required ratio} = 7x : \frac{21}{2}x : 14x$$

$$14x : 21x : 28x$$

$$2 : 3 : 4.$$

15. In a mixture 60 litres, the ratio of milk and water 2 : 1. If the this ratio is to be 1 : 2, then the quantity of water to be further added is:

Answer: 60litres

Explanation:

$$\text{Quantity of milk} = \frac{60}{3}^2 \text{ litres} = 40 \text{ litres.}$$

$$\text{Quantity of water in it} = (60 - 40) \text{ litres} = 20 \text{ litres.}$$

New ratio = 1 : 2

Let quantity of water to be added further be x litres.

$$\text{Then, milk : water} = \frac{40}{20+x}$$

$$\text{Now, } \frac{40}{20+x} = \frac{1}{2}$$

$$20+x=80$$

$$x=60.$$

Quantity of water to be added = 60 litres.

SIMPLIFICATION

1. A sum of Rs. 1360 has been divided among A, B and C such that A gets

and B gets of what C gets. B's share is:

Answer: Rs. 240

Explanation:

Let C's share = Rs. x

$$\text{Then, B's share} = \text{Rs. } \frac{x}{4}, \text{ A's share} = \text{Rs. } \frac{2x}{3}, \text{ and } \text{Rs. } \frac{x}{6}$$

$$\frac{x}{6} + \frac{x}{4} + \frac{x}{2} = 1360$$

$$\frac{17x}{12} = 1360$$

$$\frac{1360 \times 12}{17} = \text{Rs. } 960$$

$$\text{Hence, B's share} = \text{Rs. } \frac{960}{4} = \text{Rs. } 240.$$

2. One-third of Rahul's savings in National Savings Certificate is equal to one-half of his savings in Public Provident Fund. If he has Rs. 1,50,000 as total savings, how much has he saved in Public Provident Fund ?

Answer: Rs. 60000

Explanation:

Let savings in N.S.C and P.P.F. be Rs. x and Rs. $(150000 - x)$ respectively. Then,

$$\frac{1}{3}x = \frac{1}{2}(150000 - x)$$

$$x + x = 75000$$

$$3 : 2$$

$$\frac{5x}{6} = 75000$$

$$\frac{75000 \times 6}{5} = 90000$$

$$x = 5$$

Savings in Public Provident Fund = Rs. $(150000 - 90000) = \text{Rs. } 60000$

3. A fires 5 shots to B's 3 but A kills only once in 3 shots while B kills once in 2 shots. When B has missed 27 times, A has killed:

Answer: 30

Explanation:

Let the total number of shots be x . Then,

$$\text{Shots fired by A} = \frac{5}{8}x$$

$$\text{Shots fired by B} = \frac{3}{8}x$$

$$\text{Killing shots by A} = \frac{1}{3} \text{ of } \frac{5}{8}x = \frac{5}{24}x$$

$$\text{Shots missed by B} = \frac{1}{2} \text{ of } \frac{3}{8}x = \frac{3}{16}x$$

$$\frac{3x}{16} = 27 \text{ or } x = \frac{27 \times 16}{3} = 144.$$

$$\text{Birds killed by A} = \frac{5x}{24} = \frac{5}{24} \times 144 = 30.$$

4. Eight people are planning to share equally the cost of a rental car. If one person withdraws from the arrangement and the others share equally the entire cost of the car, then the share of each of the remaining persons increased by:

Answer: $(1/7)$

Explanation:

$$\text{Original share of 1 person} = \frac{1}{8}$$

$$\text{New share of 1 person} = \frac{1}{7}$$

$$\text{Increase} = \frac{1}{7} - \frac{1}{8} = \frac{1}{56}$$

$$\text{Required fraction} = \frac{(1/56)}{1/(1/8)} = \frac{1}{56} \times 8 = \frac{1}{7}$$

5. To fill a tank, 25 buckets of water is required. How many buckets of water will be required to fill the same tank if the capacity of the bucket is reduced to two-fifth of its present ?

Answer: 62.5

Explanation:

Let the capacity of 1 bucket = x .

Then, the capacity of tank = $25x$.

$$\text{New capacity of bucket} = \frac{2}{5}x$$

$$25x$$

$$\text{Required number of buckets} = (2x/5)$$

$$\begin{aligned} &= \frac{5}{25x} \times 2x \\ &= \frac{125}{2} \\ &= 62.5 \end{aligned}$$

6. In a regular week, there are 5 working days and for each day, the working hours are 8. A man gets Rs. 2.40 per hour for regular work and Rs. 3.20 per hours for overtime. If he earns Rs. 432 in 4 weeks, then how many hours does he work for?

Answer: 175

Explanation:

Suppose the man works overtime for x hours.

Now, working hours in 4 weeks = $(5 \times 8 \times 4) = 160$.

$$160 \times 2.40 + x \times 3.20 = 432$$

$$3.20x = 432 - 384 = 48$$

$$x = 15.$$

Hence, total hours of work = $(160 + 15) = 175$.

7. Free notebooks were distributed equally among children of a class. The number of notebooks each child got was one-eighth of the number of children. Had the number of children been half, each child would have got 16 notebooks. Total how many notebooks were distributed?

Answer: 512

Explanation:

Let total number of children be x .

$$\text{Then, } x \times \frac{1}{8}x = \frac{x^2}{8} = 16 \quad x = 64.$$

$$\text{Number of notebooks} = \frac{1}{8}x^2 = \frac{1}{8} \times 64 \times 64 = 512.$$

8. A man has some hens and cows. If the number of heads be 48 and the number of feet equals 140, then the number of hens will be:

Answer: 26

Explanation:

Let the number of hens be x and the number of cows be y .

Then, $x + y = 48$ (i)

$$\text{and } 2x + 4y = 140 \quad x + 2y = 70 \text{ (ii)}$$

Solving (i) and (ii) we get: $x = 26, y = 22$.

The required answer = 26.

$$9. (469 + 174)^2 - (469 - 174)^2 = ? \\ (469 \times 174)$$

Answer: 4

Explanation:

$$\text{Given exp.} = \frac{(a+b)^2 - (a-b)^2}{ab} \\ = \frac{4ab}{ab} \\ = 4 \text{ (where } a = 469, b = 174\text{.)}$$

10. David gets on the elevator at the 11th floor of a building and rides up at the rate of 57 floors per minute. At the same time, Albert gets on an elevator at the 51st floor of the same building and rides down at the rate of 63 floors per minute. If they continue travelling at these rates, then at which floor will their paths cross?

Answer: 30th floor

Explanation:

Suppose their paths cross after x minutes.

$$\text{Then, } 11 + 57x = 51 - 63x \quad 120x = 40$$

$$x = \frac{1}{3}$$

$$\text{Number of floors covered by David in } (1/3) \text{ min.} = \frac{1}{3} \times 57 = 19.$$

So, their paths cross at (11+19) i.e., 30th floor.

11. A man has Rs. 480 in the denominations of one-rupee notes, five-rupee notes and ten-rupee notes. The number of notes of each denomination is equal. What is the total number of notes that he has?

Answer: 90

Explanation:

Let number of notes of each denomination be x .

$$\text{Then } x + 5x + 10x = 480$$

$$16x = 480$$

$$x = 30.$$

Hence, total number of notes = $3x = 90$.

12. There are two examinations rooms A and B. If 10 students are sent from A to B, then the number of students in each room is the same. If 20 candidates are sent from B to A, then the number of students in A is double the number of students in B. The number of students in room A is:

Answer: 100

Explanation:

Let the number of students in rooms A and B be x and y respectively.

$$\text{Then, } x - 10 = y + 10 \quad x - y = 20 \dots \text{(i)}$$

$$\text{and } x + 20 = 2(y - 20) \quad x - 2y = -60 \dots \text{(ii)}$$

Solving (i) and (ii) we get: $x = 100$, $y = 80$.

The required answer A = 100.

13. The price of 10 chairs is equal to that of 4 tables. The price of 15 chairs and 2 tables together is Rs. 4000. The total price of 12 chairs and 3 tables is:

Answer: Rs.3900

Explanation:

Let the cost of a chair and that of a table be Rs. x and Rs. y respectively.

$$\text{Then, } 10x = 4y \text{ or } y = \frac{5}{2}x$$

$$15x + 2y = 4000$$

$$\begin{array}{r} 5 \\ \times \\ 15x + 2x^2 \\ \hline 4000 \end{array}$$

$$20x = 4000$$

$$x = 200.$$

$$\text{So, } y = \frac{5}{2} \times 200 = 500.$$

Hence, the cost of 12 chairs and 3 tables = $12x + 3y$
= Rs. (2400 + 1500)

= Rs. 3900.

14. If $a - b = 3$ and $a^2 + b^2 = 29$, find the value of ab .

Answer: 10

Explanation:

$$\begin{aligned} 2ab &= (a^2 + b^2) - (a - b)^2 \\ &= 29 - 9 = 20 \end{aligned}$$

$$ab = 10.$$

15. The price of 2 sarees and 4 shirts is Rs. 1600. With the same money one can buy 1 saree and 6 shirts. If one wants to buy 12 shirts, how much shall he have to pay ?

Answer: Rs.2400

Explanation:

Let the price of a saree and a shirt be Rs. x and Rs. y respectively.

$$\begin{array}{l} \text{Then, } 2x + 4y = 1600 \dots \text{(i)} \\ \text{and } x + 6y = 1600 \dots \text{(ii)} \end{array}$$

Divide equation (i) by 2, we get the below equation.

$$\Rightarrow x + 2y = 800. \dots \text{(iii)}$$

Now subtract (iii) from (ii)

$$\begin{array}{r} x + 6y = 1600 \text{ (-)} \\ x + 2y = 800 \\ \hline 4y = 800 \end{array}$$

Therefore, $y = 200$.

Now apply value of y in (iii)

$$\Rightarrow x + 2 \times 200 = 800$$

$$\Rightarrow x + 400 = 800$$

Therefore $x = 400$

Solving (i) and (ii) we get $x = 400$, $y = 200$.

Cost of 12 shirts = Rs. (12×200) = Rs. 2400.

PROBLEMS ON H.C.F AND L.C.M

1. The product of two numbers is 4107. If the H.C.F. of these numbers is 37, then the greater number is:

Answer: 111

Explanation:

Let the numbers be $37a$ and $37b$.

Then, $37a \times 37b = 4107$

$$ab = 3.$$

Now, co-primes with product 3 are (1, 3).

So, the required numbers are $(37 \times 1, 37 \times 3)$ i.e., (37, 111).

Greater number = 111.

2. Three numbers are in the ratio of 3 : 4 : 5 and their L.C.M. is 2400. Their H.C.F. is:

Answer: 40

Explanation:

Let the numbers be $3x$, $4x$ and $5x$.

Then, their L.C.M. = $60x$.

So, $60x = 2400$ or $x = 40$.

The numbers are (3×40) , (4×40) and (5×40) .

Hence, required H.C.F. = 40.

3. The G.C.D. of 1.08, 0.36 and 0.9 is:

Answer: 0.18

Explanation:

Given numbers are 1.08, 0.36 and 0.90. H.C.F. of 108, 36 and 90 is 18,

H.C.F. of given numbers = 0.18.

4. The product of two numbers is 2028 and their H.C.F. is 13. The number of such pairs is:

Answer: 2

Explanation:

Let the numbers $13a$ and $13b$.

Then, $13a \times 13b = 2028$

$$ab = 12.$$

Now, the co-primes with product 12 are (1, 12) and (3, 4).

[Note: Two integers a and b are said to be **coprime** or relatively prime if they have no common positive factor other than 1 or, equivalently, if their greatest common divisor is 1.]
So, the required numbers are $(13 \times 1, 13 \times 12)$ and $(13 \times 3, 13 \times 4)$.

Clearly, there are 2 such pairs.

5. The least multiple of 7, which leaves a remainder of 4, when divided by 6, 9, 15 and 18 is:

Answer: 364

Explanation:

L.C.M. of 6, 9, 15 and 18 is 90.

Let required number be $90k + 4$, which is multiple of 7.

Least value of k for which $(90k + 4)$ is divisible by 7 is $k = 4$.

$$\text{Required number} = (90 \times 4) + 4 = 364.$$

6. Find the lowest common multiple of 24, 36 and 40.

Answer: 360

Explanation:

$$2 | 24 - 36 - 40$$

$$2 | 12 - 18 - 20$$

$$2 | 6 - 9 - 10$$

$$3 | 3 - 9 - 5$$

$$| 1 - 3 - 5$$

$$\text{L.C.M.} = 2 \times 2 \times 2 \times 3 \times 3 \times 5 = 360.$$

7. The least number which should be added to 2497 so that the sum is exactly divisible by 5, 6, 4 and 3 is:

Answer: 23

Explanation:

L.C.M. of 5, 6, 4 and 3 = 60.

On dividing 2497 by 60, the remainder is 37.

$$\text{Number to be added} = (60 - 37) = 23.$$

8. Reduce $\frac{128352}{238368}$ to its lowest terms.

Answer: $\frac{7}{13}$

Explanation:

128352) 238368 (1

128352

110016) 128352 (1

110016

18336) 110016 (6

110016

x

So, H.C.F. of 128352 and 238368 = 18336.

128352 128352 ÷ 18336 7

Therefore, ----- = ----- = --

238368 238368 ÷ 18336 13

9. The least number which when divided by 5, 6, 7 and 8 leaves a remainder 3, but when divided by 9 leaves no remainder, is:

Answer: 1683

Explanation:

L.C.M. of 5, 6, 7, 8 = 840.

Required number is of the form $840k + 3$

Least value of k for which $(840k + 3)$ is divisible by 9 is $k = 2$.

Required number = $(840 \times 2 + 3) = 1683$.

10. A, B and C start at the same time in the same direction to run around a circular stadium. A completes a round in 252 seconds, B in 308 seconds and C in 198 seconds, all starting at the same point. After what time will they again at the starting point?

Answer: 46min12sec

Explanation:

L.C.M. of 252, 308 and 198 = 2772.

So, A, B and C will again meet at the starting point in 2772 sec. i.e., 46 min. 12 sec.

11. The H.C.F. of two numbers is 11 and their L.C.M. is 7700. If one of the numbers is 275, then the other is:

Answer: 308

Explanation:

Other number = $\frac{11 \times 7700}{275} = 308$.

12. What will be the least number which when doubled will be exactly divisible by 12, 18, 21 and 30?

Answer: 630

Explanation:

L.C.M. of 12, 18, 21 30 $2 | 12 - 18 - 21 - 30$

$= 2 \times 3 \times 2 \times 3 \times 7 \times 5 = 1260$. $3 | 6 - 9 - 21 - 15$

Required number = $(1260 \div 2) | 2 - 3 - 7 - 5$

= 630.

13. The ratio of two numbers is 3 : 4 and their H.C.F. is 4. Their L.C.M. is:

Answer: 48

Explanation:

Let the numbers be $3x$ and $4x$. Then, their H.C.F. = x . So, $x = 4$.

So, the numbers 12 and 16.

L.C.M. of 12 and 16 = 48.

14. The smallest number which when diminished by 7, is divisible 12, 16, 18, 21 and 28 is:

Answer: 1015

Explanation:

Required number = (L.C.M. of 12, 16, 18, 21, 28) + 7

= 1008 + 7

= 1015

15. 252 can be expressed as a product of primes as:

Answer: $2 \times 2 \times 3 \times 3 \times 7$.

Explanation:

Clearly, $252 = 2 \times 2 \times 3 \times 3 \times 7$.

16. The greatest possible length which can be used to measure exactly the lengths 7 m, 3 m 85 cm, 12 m 95 cm is:

Answer: 35cm

Explanation:

Required length = H.C.F. of 700 cm, 385 cm and 1295 cm = 35 cm.

17. Three numbers which are co-prime to each other are such that the product of the first two is 551 and that of the last two is 1073. The sum of the three numbers is:

Answer: 85

Explanation:

Since the numbers are co-prime, they contain only 1 as the common factor.

Also, the given two products have the middle number in common.

So, middle number = H.C.F. of 551 and 1073 = 29;

$$\begin{array}{rcl} \text{First number} & \begin{array}{c} 551 \\ 29 \end{array} & = 19; \quad \text{Third number} = \begin{array}{c} 1073 \\ 29 \end{array} = 37. \end{array}$$

$$\text{Required sum} = (19 + 29 + 37) = 85.$$

18. Find the highest common factor of 36 and 84.

Answer: 12

Explanation:

$$36 = 2^2 \times 3^2$$

$$84 = 2^2 \times 3 \times 7$$

$$\text{H.C.F.} = 2^2 \times 3 = 12.$$

19. Find the greatest number that will divide 43, 91 and 183 so as to leave the same remainder in each case.

Answer: 4

Explanation:

Required number = H.C.F. of (91 - 43), (183 - 91) and (183 - 43)

$$= \text{H.C.F. of } 48, 92 \text{ and } 140 = 4.$$

20. The H.C.F. of two numbers is 23 and the other two factors of their L.C.M. are 13 and 14.

The larger of the two numbers is:

Answer: 322

Explanation:

Clearly, the numbers are (23 x 13) and (23 x 14).

$$\text{Larger number} = (23 \times 14) = 322.$$

21. Six bells commence tolling together and toll at intervals of 2, 4, 6, 8, 10 and 12 seconds respectively. In 30 minutes, how many times do they toll together?

Answer: 16times

Explanation:

L.C.M. of 2, 4, 6, 8, 10, 12 is 120.

So, the bells will toll together after every 120 seconds(2 minutes).

In 30 minutes, they will toll together $\frac{30}{2} + 1 = 16$ times.

22. Let N be the greatest number that will divide 1305, 4665 and 6905, leaving the same remainder in each case. Then sum of the digits in N is:

Answer: 4

Explanation:

N = H.C.F. of (4665 - 1305), (6905 - 4665) and (6905 - 1305)

$$= \text{H.C.F. of } 3360, 2240 \text{ and } 5600 = 1120.$$

Sum of digits in N = (1 + 1 + 2 + 0) = 4

23. The greatest number of four digits which is divisible by 15, 25, 40 and 75 is:

Answer: 9600

Explanation:

Greatest number of 4-digits is 9999.

L.C.M. of 15, 25, 40 and 75 is 600.

On dividing 9999 by 600, the remainder is 399.

$$\text{Required number} (9999 - 399) = 9600.$$

24. Which of the following fraction is the largest ?

$$\frac{7}{8}, \frac{13}{16}, \frac{31}{32}$$

Answer: $\frac{7}{8}$

Explanation:

L.C.M. of 8, 16, 40 and 80 = 80.

$$\frac{7}{8} = \frac{70}{80}$$

$$\frac{13}{16} = \frac{130}{80}$$

$$\frac{31}{32} = \frac{310}{80}$$

Since, $\frac{70}{80} > \frac{130}{80} > \frac{130}{80} > \frac{310}{80}$, so $\frac{7}{8} > \frac{13}{16} > \frac{31}{32}$

So, $\frac{7}{8}$ is the largest.

25. The least number, which when divided by 12, 15, 20 and 54 leaves in each case a remainder of 8 is:

Answer: 548

Explanation:

Required number = (L.C.M. of 12, 15, 20, 54) + 8

$$= 540 + 8$$

$$= 548.$$

SQUARE ROOT AND CUBE ROOT

1. If $a = 0.1039$, then the value of $\sqrt{4a^2 - 4a + 1 + 3a}$ is:

Answer: 1.1039

Explanation:

$$\sqrt{4a^2 - 4a + 1 + 3a} = \sqrt{(1 - 2a)^2 + 3a}$$

$$= (1 - 2a) + 3a$$

$$= (1 + a)$$

$$= (1 + 0.1039)$$

$$= 1.1039$$

2. If $x = \frac{\sqrt{3} + 1}{\sqrt{3} - 1}$ and $y = \frac{\sqrt{3} - 1}{\sqrt{3} + 1}$, then the value of $(x^2 + y^2)$ is:

Answer: 14

Explanation:

$$x = \frac{(\sqrt{3} + 1)(\sqrt{3} + 1)}{(\sqrt{3} - 1)(\sqrt{3} + 1)} = \frac{(\sqrt{3} + 1)^2}{(3 - 1)} = \frac{3 + 1 + 2\sqrt{3}}{2} = 2 + \sqrt{3}.$$

$$y = \frac{(\sqrt{3} - 1)(\sqrt{3} - 1)}{(\sqrt{3} + 1)(\sqrt{3} - 1)} = \frac{(\sqrt{3} - 1)^2}{(3 - 1)} = \frac{3 + 1 - 2\sqrt{3}}{2} = 2 - \sqrt{3}.$$

$$\begin{aligned}x^2 + y^2 &= (2 + \sqrt{3})^2 + (2 - \sqrt{3})^2 \\&= 2(4 + 3) \\&= 14\end{aligned}$$

3. A group of students decided to collect as many paise from each member of group as is the number of members. If the total collection amounts to Rs. 59.29, the number of the member is the group is:

Answer: 77

Explanation:

Money collected = (59.29×100) paise = 5929 paise.

Number of members = $\sqrt{5929} = 77$.

4. A group of students decided to collect as many paise from each member of group as is the number of members. If the total collection amounts to Rs. 59.29, the number of the member is the group is:

Answer: 77

Explanation:

Money collected = (59.29×100) paise = 5929 paise.

Number of members = $\sqrt{5929} = 77$.

5. If $5 = 2.236$, then the value of $\frac{5}{2} - \frac{10}{5} + 125$ is equal to:

Answer: 7.826

Explanation:

$$\begin{aligned}\frac{\sqrt{5}}{2} - \frac{10}{\sqrt{5}} + \sqrt{125} &= \frac{(\sqrt{5})^2 - 20 + 2\sqrt{5} \times 5\sqrt{5}}{2\sqrt{5}} \\&= \frac{5 - 20 + 50}{2\sqrt{5}} \\&= \frac{35}{2\sqrt{5}} \\&= \frac{35\sqrt{5}}{10} \\&= \frac{7\sqrt{5}}{2} \\&= \frac{7 \times 2.236}{2} \\&= 7.826\end{aligned}$$

= 7×1.118

= 7.826

6. $\frac{[\sqrt{625} - 14]}{11} \times \frac{11}{\sqrt{25} - 11} \times \frac{11}{\sqrt{196} - 14}$ is equal to:

Answer: 5

Explanation:

- Given expression $\frac{[\sqrt{625} - 14]}{11} \times \frac{11}{\sqrt{25} - 11} \times \frac{11}{\sqrt{196} - 14}$ is equal to:

7. $\sqrt{0.0169 \times ?} = 1.3$

Answer: 100

Explanation:

Let $\sqrt{0.0169 \times x} = 1.3$.

Then, $0.0169x = (1.3)^2 = 1.69$

$x = \frac{1.69}{0.0169} = 100$ The square root of $(7 + 3\sqrt{5})(7 - 3\sqrt{5})$ is

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8. The square root of 64009 is:

Answer: 253

Explanation:

$$\begin{array}{r} 2|64009(253) \\ |4 \\ |----- \\ 45|240 \\ |225 \\ |----- \\ 503|1509 \\ |1509 \\ |----- \\ |X \\ |----- \end{array}$$

$\sqrt{64009} = 253$.

9. How many two-digit numbers satisfy this property.: The last digit (unit's digit) of the square of the two-digit number is 8?

Answer: A number ending in 8 can never be a perfect square.

Explanation:

A number ending in 8 can never be a perfect square.

10. $\{\sqrt{3} - \frac{1}{\sqrt{3}}\}^2$ simplifies to:

Answer: 4/3

Explanation:

$$\begin{aligned}
 & [\frac{1}{\sqrt{3}} - \frac{1}{\sqrt{3}}]^2 = (\sqrt{3})^2 + [\frac{1}{\sqrt{3}}]^2 - 2 \times \sqrt{3} \times \frac{1}{\sqrt{3}} \\
 & = 3 + \frac{1}{3} - 2 \\
 & = 1 + \frac{1}{3} \\
 & = \frac{4}{3}
 \end{aligned}$$

11. The cube root of .000216 is:

Answer: 0.06

Explanation:

$$\begin{aligned}
 & (.000216)^{1/3} = \frac{216}{10^6} \\
 & = \frac{6 \times 6 \times 6}{10^2 \times 10^2 \times 10^2} \\
 & = \frac{6}{10^2} \\
 & = \frac{6}{100} \\
 & = 0.06
 \end{aligned}$$

12. The least perfect square, which is divisible by each of 21, 36 and 66 is:

Answer: 213444

Explanation:

L.C.M. of 21, 36, 66 = 2772.

$$\text{Now, } 2772 = 2 \times 2 \times 3 \times 3 \times 7 \times 11$$

To make it a perfect square, it must be multiplied by 7×11 .

So, required number = $2^2 \times 3^2 \times 7^2 \times 11^2 = 213444$

Answer: 1.25

Explanation:

$$\begin{array}{r}
 1 | 1.5625(1.25 \\
 | 1 \\
 | \text{-----} \\
 22 | 56 \\
 | 44 \\
 | \text{-----} \\
 245 | 1225 \\
 | 1225 \\
 | \text{-----} \\
 | \quad X \\
 | \text{-----}
 \end{array}$$

14. The square root of $(7+\sqrt{5})(7-3\sqrt{5})$ is

Answer: 2

Explanation:

15. What should come in place of both x in the equation $\frac{x}{128} = \frac{162}{x}$?

Answer: 12

Explanation:

$$\begin{aligned} \text{Let } x &= \sqrt{162} \\ \sqrt{128} &= x \\ \text{Then } x^2 &= \sqrt{(128 \times 162)} \\ &= \sqrt{(64 \times 2 \times 18 \times 9)} \\ &= \sqrt{(8^2 \times 6^2 \times 3^2)} \\ &= 8 \times 6 \times 3 \\ &= 144 \end{aligned}$$

$$x = \sqrt{144} = 12$$

- $$13. \quad \text{Sqrt}(1.5625) = ?$$

LOGARITHM

1. If $\log_{10} 7 = a$, then $\log_{10} \frac{1}{70}$ is equal to:

Answer: -(a+1)

Explanation:

$$\begin{aligned}\log_{10} \frac{1}{70} &= \log_{10} 1 - \log_{10} 70 \\&= -\log_{10} (7 \times 10) \\&= -(\log_{10} 7 + \log_{10} 10) \\&= -(a + 1).\end{aligned}$$

2. If $\log_{10} 2 = 0.3010$, then $\log_2 10$ is equal to:

Answer: 1000/301

Explanation:

$$\log_2 10 = \frac{1}{\log_{10} 2} = \frac{1}{0.3010} = \frac{10000}{3010} = \frac{1000}{301}.$$

3. If $\log_{10} 2 = 0.3010$, the value of $\log_{10} 80$ is:

Answer: 1.9030

Explanation:

$$\begin{aligned}\log_{10} 80 &= \log_{10} (8 \times 10) \\&= \log_{10} 8 + \log_{10} 10 \\&= \log_{10} (2^3) + 1 \\&= 3 \log_{10} 2 + 1 \\&= (3 \times 0.3010) + 1 \\&= 1.9030.\end{aligned}$$

4. If $\log_{10} 5 + \log_{10} (5x + 1) = \log_{10} (x + 5) + 1$, then x is equal to:

Answer: 3

Explanation:

$$\log_{10} 5 + \log_{10} (5x + 1) = \log_{10} (x + 5) + 1$$

$$\log_{10} 5 + \log_{10} (5x + 1) = \log_{10} (x + 5) + \log_{10} 10$$

$$\log_{10} [5(5x + 1)] = \log_{10} [10(x + 5)]$$

$$5(5x + 1) = 10(x + 5)$$

$$5x + 1 = 2x + 10$$

$$3x = 9$$

$$x = 3.$$

5.

$$\text{The value of } \log_3 60^{\frac{1}{1}} \log_4 60^{\frac{1}{1}} \log_5 60^{\frac{1}{1}} \text{ is:}$$

Answer: 1

Explanation:

$$\begin{aligned}\text{Given expression} &= \log_{60} 3 + \log_{60} 4 + \log_{60} 5 \\&= \log_{60} (3 \times 4 \times 5) \\&= \log_{60} 60 \\&= 1.\end{aligned}$$

6. If $\log 2 = 0.30103$, the number of digits in 2^{64} is:

Answer: 20

Explanation:

$$\begin{aligned}\log (2^{64}) &= 64 \times \log 2 \\&= (64 \times 0.30103) \\&= 19.26592\end{aligned}$$

Its characteristic is 19.

Hence, then number of digits in 2^{64} is 20.

7.

$$\text{If } \log_x \frac{9}{16} = -\frac{1}{2}, \text{ then } x \text{ is equal to:}$$

Answer: 256/81

Explanation:

$$\begin{aligned}\log_x \frac{9}{16} &= -\frac{1}{2} \\ \frac{9}{16} &= x^{-\frac{1}{2}} \\ \sqrt{x} &= \frac{9}{16} \\ \sqrt{x} &= \frac{9}{16} \\ x &= \frac{9^2}{16^2} \\ x &= \frac{81}{256}\end{aligned}$$

8. If $a^x = b^y$, then:

Answer:

$$\begin{aligned}\log a &= y \\ \log b &= x\end{aligned}$$

Explanation:

$$a^x = b^y$$

$$\log a^x = \log b^y$$

$$x \log a = y \log b$$

$$\begin{aligned}\log a &= y \\ \log b &= x\end{aligned}$$

9. If $\log_x y = 100$ and $\log_2 x = 10$, then the value of y is:

Answer: 2^{1000}

Explanation:

$$\log_2 x = 10$$

$$x = 2^{10}$$

$$\log_x y = 100$$

$$y = x^{100}$$

$$y = (2^{10})^{100} \quad [\text{put value of } x]$$

$$y = 2^{1000}$$

$$\log_2 16 = 4.$$

11. If $\log 2 = 0.3010$ and $\log 3 = 0.4771$, the value of $\log_5 512$ is:

Answer: 3.876

Explanation:

$$\begin{aligned}\log_5 512 &= \frac{\log 512}{\log 5} \\ &= \frac{\log 2^9}{\log (10/2)} \\ &= \frac{9 \log 2}{\log 10 - \log 2} \\ &= \frac{(9 \times 0.3010)}{1 - 0.3010} \\ &= \frac{2.709}{0.699} \\ &= \frac{2709}{699} \\ &= 3.876\end{aligned}$$

10. The value of $\log_2 16$ is:

Answer: 4

Explanation:

$$\text{Let } \log_2 16 = n.$$

$$\text{Then, } 2^n = 16 = 2^4$$

$$n = 4.$$

12. Which of the following statements is not correct?

$$\log_{10} 10 = 1, \log (2 + 3) = \log (2 \times 3), \log_{10} 1 = 0, \log (1 + 2 + 3) = \log 1 + \log 2 + \log 3.$$

Answer: $\log (2 + 3) = \log (2 \times 3)$

Explanation:

- (a) Since $\log_a a = 1$, so $\log_{10} 10 = 1$.
 (b) $\log (2 + 3) = \log 5$ and $\log (2 \times 3) = \log 6 = \log 2 + \log 3$

- $\log (2 + 3) \quad \log (2 \times 3)$
 (c) Since $\log_a 1 = 0$, so $\log_{10} 1 = 0$.
 (d) $\log (1 + 2 + 3) = \log 6 = \log (1 \times 2 \times 3) = \log 1 + \log 2 + \log 3$.
 So, (b) is incorrect.

VOLUME AND SURFACE AREA

1. A boat having a length 3 m and breadth 2 m is floating on a lake. The boat sinks by 1 cm when a man gets on it. The mass of the man is:

Answer: 60kg

Explanation:

$$\begin{aligned}\text{Volume of water displaced} &= (3 \times 2 \times 0.01) \text{ m}^3 \\ &= 0.06 \text{ m}^3.\end{aligned}$$

$$\begin{aligned}
 &= \text{Volume of water displaced} \times \text{Density of water} \\
 \text{Mass of man} &= (0.06 \times 1000) \text{ kg} \\
 &= 60 \text{ kg.}
 \end{aligned}$$

2. 50 men took a dip in a water tank 40 m long and 20 m broad on a religious day. If the average displacement of water by a man is 4 m^3 , then the rise in the water level in the tank will be:

Answer: 25cm

Explanation:

$$\begin{aligned}
 \text{Total volume of water displaced} &= (4 \times 50) \text{ m}^3 = 200 \text{ m}^3. \\
 \text{Rise in water level} &= \frac{200}{40 \times 20} \text{ m} = 0.25 \text{ m} = 25 \text{ cm.}
 \end{aligned}$$

3. The slant height of a right circular cone is 10 m and its height is 8 m. Find the area of its curved surface.

Answer: $60\pi \text{ m}^2$

Explanation:

$$l = 10 \text{ m,}$$

$$h = 8 \text{ m.}$$

$$\text{So, } r = \sqrt{l^2 - h^2} = \sqrt{(10)^2 - 8^2} = 6 \text{ m.}$$

$$\text{Curved surface area} = (\pi)r l = ((\pi) \times 6 \times 10) \text{ m}^2 = 60\pi \text{ m}^2.$$

4. A cistern 6m long and 4 m wide contains water up to a depth of 1 m 25 cm. The total area of the wet surface is:

Answer: 49 m^2

Explanation:

$$\begin{aligned}
 \text{Area of the wet surface} &= [2(lb + bh + lh) - lb] \\
 &= 2(bh + lh) + lb \\
 &= [2(4 \times 1.25 + 6 \times 1.25) + 6 \times 4] \text{ m}^2 \\
 &= 49 \text{ m}^2.
 \end{aligned}$$

5. A metallic sheet is of rectangular shape with dimensions 48 m x 36 m. From each of its corners, a square is cut off so as to make an open box. If the length of the square is 8 m, the volume of the box (in m^3) is:

Answer: 5120 m^3

Explanation:

$$\begin{aligned}
 \text{Clearly, } l &= (48 - 16) \text{ m} = 32 \text{ m,} \\
 b &= (36 - 16) \text{ m} = 20 \text{ m,} \\
 h &= 8 \text{ m.}
 \end{aligned}$$

$$\text{Volume of the box} = (32 \times 20 \times 8) \text{ m}^3 = 5120 \text{ m}^3.$$

6. The curved surface area of a cylindrical pillar is 264 m^2 and its volume is 924 m^3 . Find the ratio of its diameter to its height.

Answer: 7:3

Explanation:

$$\begin{aligned}
 \frac{\pi r^2 h}{2\pi r h} &= \frac{924}{264} & r &= \frac{924 \times 2}{264} = 7 \text{ m.} \\
 \text{And, } 2\pi r h &= 264 & h &= \frac{264 \times 7}{22 \times 2 \times 7} = 6 \text{ m.} \\
 && 2r &= 14 \\
 && r &= 7 \\
 \text{Required ratio} &= h : r = 6 : 7 = 7 : 3.
 \end{aligned}$$

7. A cistern of capacity 8000 litres measures externally 3.3 m by 2.6 m by 1.1 m and its walls are 5 cm thick. The thickness of the bottom is:

Answer: 1dm

Explanation:

Let the thickness of the bottom be x cm.

$$\text{Then, } [(330 - 10) \times (260 - 10) \times (110 - x)] = 8000 \times 1000$$

$$\begin{aligned}
 320 \times 250 \times (110 - x) &= 8000 \times 1000 \\
 8000 \times 1000 &= 320 \times 250 \\
 (110 - x) &= \frac{8000 \times 1000}{320 \times 250} = 100
 \end{aligned}$$

$$x = 10 \text{ cm} = 1 \text{ dm.}$$

8. What is the total surface area of a right circular cone of height 14 cm and base radius 7 cm?

Answer: 498.35 cm^2

Explanation:

$$h = 14 \text{ cm, } r = 7 \text{ cm.}$$

$$\text{So, } l = \sqrt{(7)^2 + (14)^2} = 245 = 75 \text{ cm.}$$

$$\begin{aligned}
 \text{Total surface area} &= \pi r l + \pi r^2 \\
 &= \frac{22}{7} \times 7 \times 75 + \frac{22}{7} \times 7 \times 7 \text{ cm}^2 \\
 &= [154(\sqrt{5} + 1)] \text{ cm}^2 \\
 &= (154 \times 3.236) \text{ cm}^2 \\
 &= 498.35 \text{ cm}^2.
 \end{aligned}$$

9. A large cube is formed from the material obtained by melting three smaller cubes of 3, 4 and 5 cm side. What is the ratio of the total surface areas of the smaller cubes and the large cube?

Answer: 25:18

Explanation:

$$\text{Volume of the large cube} = (3^3 + 4^3 + 5^3) = 216 \text{ cm}^3.$$

Let the edge of the large cube be a .

$$\text{So, } a^3 = 216$$

$$a = 6 \text{ cm.}$$

$$\text{Required ratio} = \frac{6 \times (3^2 + 4^2 + 5^2)}{6 \times 6^2} = \frac{50}{36} = 25 : 18.$$

10. How many bricks, each measuring 25 cm x 11.25 cm x 6 cm, will be needed to build a wall of 8 m x 6 m x 22.5 cm?

Answer: 6400

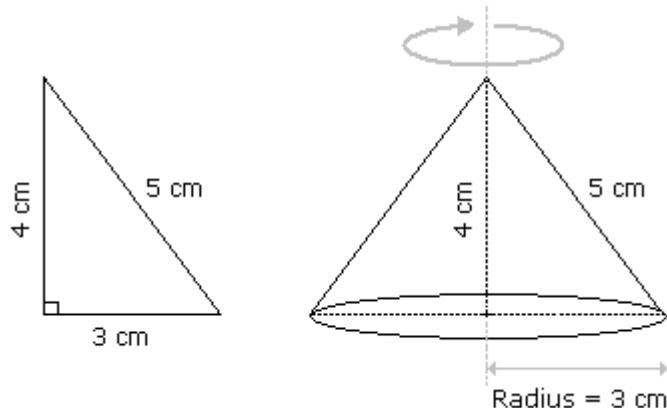
Explanation:

$$\text{Number of bricks} = \frac{\text{Volume of the wall}}{\text{Volume of 1 brick}} = \frac{800 \times 600 \times 22.5}{25 \times 11.25 \times 6} = 6400.$$

11. A right triangle with sides 3 cm, 4 cm and 5 cm is rotated about the side of 3 cm to form a cone. The volume of the cone so formed is:

Answer: $12\pi \text{ cm}^3$

Explanation:



Clearly, we have $r = 3 \text{ cm}$ and $h = 4 \text{ cm}$.

$$\text{Volume} = \frac{1}{3} \pi r^2 h = \frac{1}{3} \pi \times 3^2 \times 4 \text{ cm}^3 = 12\pi \text{ cm}^3.$$

12. A hall is 15 m long and 12 m broad. If the sum of the areas of the floor and the ceiling is equal to the sum of the areas of four walls, the volume of the hall is:

Answer: 1200 m³

Explanation:

$$2(15 + 12) \times h = 2(15 \times 12)$$

$$h = \frac{180}{27} \text{ m} = \frac{20}{3} \text{ m.}$$

$$\text{Volume} = \frac{15 \times 12 \times \frac{20}{3}}{3} \text{ m}^3 = 1200 \text{ m}^3.$$

13. In a shower, 5 cm of rain falls. The volume of water that falls on 1.5 hectares of ground is:

Answer: 750 m³

Explanation:

$$1 \text{ hectare} = 10,000 \text{ m}^2$$

$$\text{So, Area} = (1.5 \times 10000) \text{ m}^2 = 15000 \text{ m}^2.$$

$$\text{Depth} = \frac{5}{100} \text{ m} = \frac{1}{20} \text{ m.}$$

$$\text{Volume} = (\text{Area} \times \text{Depth}) = \frac{15000 \times \frac{1}{20}}{20} \text{ m}^3 = 750 \text{ m}^3.$$

14. 66 cubic centimetres of silver is drawn into a wire 1 mm in diameter. The length of the wire in metres will be:

Answer: 84m

Explanation:

Let the length of the wire be h .

$$\text{Radius} = \frac{1}{2} \text{ mm} = \frac{1}{20} \text{ cm. Then,}$$

$$\frac{22}{7} \times \frac{1}{20} \times \frac{1}{20} \times h = 66.$$

$$h = \frac{66 \times 20 \times 20 \times 7}{22} = 8400 \text{ cm} = 84 \text{ m.}$$

15. A hollow iron pipe is 21 cm long and its external diameter is 8 cm. If the thickness of the pipe is 1 cm and iron weighs 8 g/cm³, then the weight of the pipe is:

Answer: 3.696kg

Explanation:

External radius = 4 cm,
Internal radius = 3 cm.

$$\begin{aligned}\text{Volume of iron} &= \frac{22}{7} \times [(4)^2 - (3)^2] \times 21 \quad \text{cm}^3 \\ &= \frac{22}{7} \times 7 \times 1 \times 21 \quad \text{cm}^3 \\ &= 462 \text{ cm}^3.\end{aligned}$$

Weight of iron = (462×8) gm = 3696 gm = 3.696 kg.

PERMUTATION AND COMBINATION

1. In a group of 6 boys and 4 girls, four children are to be selected. In how many different ways can they be selected such that at least one boy should be there?

Answer: 209

Explanation:

We may have (1 boy and 3 girls) or (2 boys and 2 girls) or (3 boys and 1 girl) or (4 boys).

$$\begin{aligned}\text{Required number of ways} &= ({}^6C_1 \times {}^4C_3) + ({}^6C_2 \times {}^4C_2) + ({}^6C_3 \times {}^4C_1) + ({}^6C_4) \\ &= ({}^6C_1 \times {}^4C_1) + ({}^6C_2 \times {}^4C_2) + ({}^6C_3 \times {}^4C_1) + ({}^6C_2) \\ &= (6 \times 4) \quad \begin{matrix} 6 \times 4 \times \\ 2 \times \end{matrix} \quad \begin{matrix} 6 \times 5 \times \\ 2 \times \end{matrix} \quad \begin{matrix} 6 \times \\ 1 \end{matrix} \\ &\quad + \quad \begin{matrix} 5 \\ 2 \times \end{matrix} \quad + \quad \begin{matrix} 4 \times \\ 3 \times 2 \times \end{matrix} \quad + \quad \begin{matrix} 5 \\ 2 \times \end{matrix} \\ &= (24 + 90 + 80 + 15) \\ &= 209.\end{aligned}$$

2. How many 3-digit numbers can be formed from the digits 2, 3, 5, 6, 7 and 9, which are divisible by 5 and none of the digits is repeated?

Answer: 20

Explanation:

Since each desired number is divisible by 5, so we must have 5 at the unit place. So, there is 1 way of doing it.

The tens place can now be filled by any of the remaining 5 digits (2, 3, 6, 7, 9). So, there are 5 ways of filling the tens place.

The hundreds place can now be filled by any of the remaining 4 digits. So, there are 4 ways of filling it.

Required number of numbers = $(1 \times 5 \times 4) = 20$.

3. In how many ways a committee, consisting of 5 men and 6 women can be formed from 8 men and 10 women?

Answer: 11760

Explanation:

$$\begin{aligned}\text{Required number of ways} &= ({}^8C_5 \times {}^{10}C_6) \\ &= ({}^8C_3 \times {}^{10}C_4) \\ &= 8 \times 7 \times 6 \quad 10 \times 9 \times 8 \times 7 \\ &= 3 \times 2 \times 1^X 4 \times 3 \times 2 \times 1 \\ &= 11760.\end{aligned}$$

4. A box contains 2 white balls, 3 black balls and 4 red balls. In how many ways can 3 balls be drawn from the box, if at least one black ball is to be included in the draw?

Answer: 64

Explanation:

We may have(1 black and 2 non-black) or (2 black and 1 non-black) or (3 black).

$$\begin{aligned}\text{Required number of ways} &= ({}^3C_1 \times {}^6C_2) + ({}^3C_2 \times {}^6C_1) + ({}^3C_3) \\ &= 3 \times \begin{matrix} 6 \times 5 \\ 2 \times 1 \end{matrix} + \begin{matrix} 3 \times 2 \\ 2 \times 1 \end{matrix} \times 6 + 1 \\ &= (45 + 18 + 1) \\ &= 64.\end{aligned}$$

5. In how many different ways can the letters of the word 'DETAIL' be arranged in such a way that the vowels occupy only the odd positions?

Answer: 36

Explanation:

There are 6 letters in the given word, out of which there are 3 vowels and 3 consonants.

Let us mark these positions as under:

$$(1) (2) (3) (4) (5) (6)$$

Now, 3 vowels can be placed at any of the three places out 4, marked 1, 3, 5.

Number of ways of arranging the vowels = ${}^3P_3 = 3! = 6$.

Also, the 3 consonants can be arranged at the remaining 3 positions.

Number of ways of these arrangements = ${}^3P_3 \cdot 3! = 6$.

Total number of ways = $(6 \times 6) = 36$.

6. In how many ways can a group of 5 men and 2 women be made out of a total of 7 men and 3 women?

Answer: 63

Explanation:

$$\text{Required number of ways} = ({}^7C_5 \times {}^3C_2) = ({}^7C_2 \times {}^3C_1) = \frac{7 \times 6}{2 \times 1} \times 3 = 63.$$

7. How many 4-letter words with or without meaning, can be formed out of the letters of the word, 'LOGARITHMS', if repetition of letters is not allowed?

Answer: 5040

Explanation:

'LOGARITHMS' contains 10 different letters.

Required number of words = Number of arrangements of 10 letters, taking 4 at a time.

$$\begin{aligned} &= {}^{10}P_4 \\ &= (10 \times 9 \times 8 \times 7) \\ &= 5040. \end{aligned}$$

8. In how many different ways can the letters of the word 'MATHEMATICS' be arranged so that the vowels always come together?

Answer: 120960

Explanation:

In the word 'MATHEMATICS', we treat the vowels AEA as one letter.

Thus, we have MTHMTCS (AEAI).

Now, we have to arrange 8 letters, out of which M occurs twice, T occurs twice and the rest are different.

$$8! = 10080.$$

Number of ways of arranging these letters = $(2!)(2!) = 10080$.

Now, AEA has 4 letters in which A occurs 2 times and the rest are different.

$$\text{Number of ways of arranging these letters} = \frac{4!}{2!} = 12.$$

Required number of words = $(10080 \times 12) = 120960$.

9. In how many different ways can the letters of the word 'OPTICAL' be arranged so that the vowels always come together?

Answer: 720

Explanation:

The word 'OPTICAL' contains 7 different letters.

When the vowels OIA are always together, they can be supposed to form one letter.

Then, we have to arrange the letters PTCL (OIA).

Now, 5 letters can be arranged in $5! = 120$ ways.

The vowels (OIA) can be arranged among themselves in $3! = 6$ ways.

Required number of ways = $(120 \times 6) = 720$.

10. In how many ways can the letters of the word 'LEADER' be arranged?

Answer: 360

Explanation:

The word 'LEADER' contains 6 letters, namely 1L, 2E, 1A, 1D and 1R.

$$6! = 360.$$

Required number of ways = $(1!)(2!)(1!)(1!)(1!) = 360$.

11. From a group of 7 men and 6 women, five persons are to be selected to form a committee so that at least 3 men are there on the committee. In how many ways can it be done?

Answer: 756

Explanation:

We may have (3 men and 2 women) or (4 men and 1 woman) or (5 men only).

$$\begin{aligned} \text{Required number of ways} &= ({}^7C_3 \times {}^6C_2) + ({}^7C_4 \times {}^6C_1) + ({}^7C_5) \\ &= \frac{7 \times 6 \times 5}{3 \times 2 \times 1} \times \frac{6 \times 5}{2 \times 1} + ({}^7C_3 \times {}^6C_1) + ({}^7C_2) \\ &= 525 + \frac{7 \times 6 \times 5}{3 \times 2 \times 1} \times 6 + \frac{7 \times 6}{2 \times 1} \\ &= (525 + 210 + 21) \\ &= 756. \end{aligned}$$

12. In how many different ways can the letters of the word 'LEADING' be arranged in such a way that the vowels always come together?

Answer: 720

Explanation:

The word 'LEADING' has 7 different letters.

When the vowels EAI are always together, they can be supposed to form one letter.

Then, we have to arrange the letters LNDG (EAI).

Now, 5 letters can be arranged in $5! = 120$ ways.

The vowels (EAI) can be arranged among themselves in $3! = 6$ ways.

Required number of ways = $(120 \times 6) = 720$.

13. In how many different ways can the letters of the word 'CORPORATION' be arranged so that the vowels always come together?

Answer: 50400

Explanation:

In the word 'CORPORATION', we treat the vowels OOAIO as one letter.

Thus, we have CRPRTN (OOAIO).

This has 7 ($6 + 1$) letters of which R occurs 2 times and the rest are different.

Number of ways arranging these letters $= \frac{7!}{2!} = 2520$.

Now, 5 vowels in which O occurs 3 times and the rest are different, can be arranged

$$\text{in } \frac{5!}{3!} = 20 \text{ ways.}$$

$$\text{Required number of ways} = (2520 \times 20) = 50400.$$

14. Out of 7 consonants and 4 vowels, how many words of 3 consonants and 2 vowels can be formed?

Answer: 25200

Explanation:

Number of ways of selecting (3 consonants out of 7) and (2 vowels out of 4)

$$\begin{aligned} &= \binom{7}{3} \times \binom{4}{2} \\ &= \frac{7 \times 6 \times 5}{3 \times 2 \times 1} \times \frac{4 \times 3}{2 \times 1} \\ &= 210. \end{aligned}$$

Number of groups, each having 3 consonants and 2 vowels = 210.

Each group contains 5 letters.

Number of ways of arranging $= 5!$
5 letters among themselves

$$\begin{aligned} &= 5 \times 4 \times 3 \times 2 \times 1 \\ &= 120. \end{aligned}$$

$$\text{Required number of ways} = (210 \times 120) = 25200.$$

PROBABILITY

1. Two dice are thrown simultaneously. What is the probability of getting two numbers whose product is even?

Answer: 3/4

Explanation:

In a simultaneous throw of two dice, we have $n(S) = (6 \times 6) = 36$.

Then, $E = \{(1, 2), (1, 4), (1, 6), (2, 1), (2, 2), (2, 3), (2, 4), (2, 5), (2, 6), (3, 2), (3, 4), (3, 6), (4, 1), (4, 2), (4, 3), (4, 4), (4, 5), (4, 6), (5, 2), (5, 4), (5, 6), (6, 1), (6, 2), (6, 3), (6, 4), (6, 5), (6, 6)\}$

$$n(E) = 27.$$

$$n(E) = 27$$

$$P(E) = \frac{n(E)}{n(S)} = \frac{27}{36} = \frac{3}{4}.$$

2. In a class, there are 15 boys and 10 girls. Three students are selected at random. The

probability that 1 girl and 2 boys are selected, is:

Answer: 21/46

Explanation:

Let S be the sample space and E be the event of selecting 1 girl and 2 boys.

Then, $n(S) =$ Number ways of selecting 3 students out of 25

$$\begin{aligned} &= {}^{25}C_3 \\ &= \frac{(25 \times 24 \times 23)}{(3 \times 2 \times 1)} \\ &= 2300. \end{aligned}$$

$$n(E) = {}^{10}C_1 \times {}^{15}C_2$$

$$\begin{aligned} &= 10 \times \frac{(15 \times 14)}{(2 \times 1)} \\ &= 1050. \end{aligned}$$

$$\begin{aligned} P(E) &= \frac{n(E)}{n(S)} = \frac{1050}{2300} = \frac{21}{46}. \end{aligned}$$

3. In a lottery, there are 10 prizes and 25 blanks. A lottery is drawn at random. What is the probability of getting a prize?

Answer: 2/7

Explanation:

$$P(\text{getting a prize}) = \frac{10}{(10 + 25)} = \frac{10}{35} = \frac{2}{7}.$$

4. From a pack of 52 cards, two cards are drawn together at random. What is the probability of both the cards being kings?

Answer: 1/221

Explanation:

Let S be the sample space.

$$\text{Then, } n(S) = {}^{52}C_2 = \frac{(52 \times 51)}{(2 \times 1)} = 1326.$$

Let E = event of getting 2 kings out of 4.

$$\begin{aligned} &(4 \times 3) \\ &n(E) = {}^4C_2 = \frac{(4 \times 3)}{(2 \times 1)} = 6. \\ &n(E) = 6 \\ &P(E) = \frac{n(E)}{n(S)} = \frac{6}{1326} = \frac{1}{221}. \end{aligned}$$

5. Two dice are tossed. The probability that the total score is a prime number is:

Answer: 5/12

Explanation:

Clearly, $n(S) = (6 \times 6) = 36$.

Let E = Event that the sum is a prime number.

Then $E = \{(1, 1), (1, 2), (1, 4), (1, 6), (2, 1), (2, 3), (2, 5), (3, 2), (3, 4), (4, 1), (4, 3), (5, 1), (5, 2), (5, 4), (6, 1), (6, 2), (6, 3), (6, 4), (6, 5), (6, 6)\}$

(5, 2), (5, 6), (6, 1), (6, 5) }

$$n(E) = 15.$$

$$\begin{aligned} n(E) &= 15 \quad 5 \\ P(E) &= n(S) = 36 = 12. \end{aligned}$$

6. A card is drawn from a pack of 52 cards. The probability of getting a queen of club or a king of heart is:

Answer: 1/26

Explanation:

Here, $n(S) = 52$.

Let E = event of getting a queen of club or a king of heart.

Then, $n(E) = 2$.

$$\begin{aligned} n(E) &= 2 \quad 1 \\ P(E) &= n(S) = 52 = 26. \end{aligned}$$

7. A bag contains 4 white, 5 red and 6 blue balls. Three balls are drawn at random from the bag.

The probability that all of them are red, is:

Answer: 2/91

Explanation:

Let S be the sample space.

Then, $n(S)$ = number of ways of drawing 3 balls out of 15

$$\begin{aligned} &= {}^{15}C_3 \\ &= (15 \times 14 \times 13) \\ &= (3 \times 2 \times 1) \\ &= 455. \end{aligned}$$

Let E = event of getting all the 3 red balls.

$$\begin{aligned} n(E) &= {}^5C_3 = {}^5C_2 = (2 \times 1) = 10. \\ n(E) &= 10 \quad 2 \\ P(E) &= n(S) = 455 = 91. \end{aligned}$$

8. Two cards are drawn together from a pack of 52 cards. The probability that one is a spade and one is a heart, is:

Answer: 13/102

Explanation:

Let S be the sample space.

Then, $n(S) = {}^{52}C_2 = \frac{(52 \times 51)}{(2 \times 1)} = 1326$.

Let E = event of getting 1 spade and 1 heart.

$$\begin{aligned} n(E) &= \text{number of ways of choosing 1 spade out of 13 and 1 heart out of 13} \\ &= ({}^{13}C_1 \times {}^{13}C_1) \\ &= (13 \times 13) \\ &= 169. \\ n(E) &= 169 \quad 13 \\ P(E) &= n(S) = 1326 = 102. \end{aligned}$$

9. One card is drawn at random from a pack of 52 cards. What is the probability that the card drawn is a face card?

Answer: 3/13

Explanation:

Clearly, there are 52 cards, out of which there are 12 face cards.

$$\begin{aligned} &12 \quad 3 \\ P(\text{getting a face card}) &= {}^{52} = 13. \end{aligned}$$

10. A bag contains 6 black and 8 white balls. One ball is drawn at random. What is the probability that the ball drawn is white?

Answer: 4/7

Explanation:

Let number of balls = $(6 + 8) = 14$.

Number of white balls = 8.

$$P(\text{drawing a white ball}) = \frac{8}{14} = \frac{4}{7}.$$

$$n(S) = 21$$

11. Tickets numbered 1 to 20 are mixed up and then a ticket is drawn at random. What is the probability that the ticket drawn has a number which is a multiple of 3 or 5?

Answer: 9/20

Explanation:

Here, S = {1, 2, 3, 4, ..., 19, 20}.

Let E = event of getting a multiple of 3 or 5 = {3, 6, 9, 12, 15, 18, 5, 10, 20}.

$$n(E) = 9$$

$$P(E) = \frac{n(E)}{n(S)} = \frac{9}{20}$$

12. A bag contains 2 red, 3 green and 2 blue balls. Two balls are drawn at random. What is the probability that none of the balls drawn is blue?

Answer: 10/21

Explanation:

Total number of balls = $(2 + 3 + 2) = 7$.

Let S be the sample space.

Then, $n(S)$ = Number of ways of drawing 2 balls out of 7

$$= {}^7C_2$$

$$= (7 \times 6)$$

$$= (2 \times 1)$$

$$= 21.$$

Let E = Event of drawing 2 balls, none of which is blue.

$n(E)$ = Number of ways of drawing 2 balls out of $(2 + 3)$ balls.

$$= {}^5C_2$$

$$= (5 \times 4)$$

$$= (2 \times 1)$$

$$= 10.$$

$$n(E) = 10$$

$$P(E) = \frac{n(E)}{n(S)} = \frac{10}{21}$$

13. In a box, there are 8 red, 7 blue and 6 green balls. One ball is picked up randomly. What is the probability that it is neither red nor green?

Answer: 1/3

Explanation:

Total number of balls = $(8 + 7 + 6) = 21$.

Let E = event that the ball drawn is neither red nor green

= event that the ball drawn is blue.

$$n(E) = 7$$

$$n(E) = 7 = 1$$

14. What is the probability of getting a sum 9 from two throws of a dice?

Answer: 1/9

Explanation:

In two throws of a die, $n(S) = (6 \times 6) = 36$.

Let E = event of getting a sum = {(3, 6), (4, 5), (5, 4), (6, 3)}.

$$n(E) = 4$$

$$P(E) = \frac{n(E)}{n(S)} = \frac{4}{36} = \frac{1}{9}$$

15. Three unbiased coins are tossed. What is the probability of getting at most two heads?

Answer: 7/8

Explanation:

Here S = {TTT, TTH, THT, HTT, THH, HTH, HHT, HHH}

Let E = event of getting at most two heads.

Then E = {TTT, TTH, THT, HTT, THH, HTH, HHT}.

$$n(E) = 7$$

$$P(E) = \frac{n(E)}{n(S)} = \frac{7}{8}$$

AVERAGE

1. The captain of a cricket team of 11 members is 26 years old and the wicket keeper is 3 years older. If the ages of these two are excluded, the average age of the remaining players is one year less than the average age of the whole team. What is the average age of the team?

Answer: 23 yrs

Explanation:

Let the average age of the whole team by x years.

$$11x - (26 + 29) = 9(x - 1)$$

$$11x - 9x = 46$$

$$2x = 46$$

$$x = 23$$

So, average age of the team is 23 years.

2. The average monthly income of P and Q is Rs. 5050. The average monthly income of Q and R is Rs. 6250 and the average monthly income of P and R is Rs. 5200. The monthly income of P is:

Answer: Rs.4000

Explanation:

Let P, Q and R represent their respective monthly incomes. Then, we have:

$$P + Q = (5050 \times 2) = 10100 \dots \text{(i)}$$

$$Q + R = (6250 \times 2) = 12500 \dots \text{(ii)}$$

$$P + R = (5200 \times 2) = 10400 \dots \text{(iii)}$$

$$\text{Adding (i), (ii) and (iii), we get: } 2(P + Q + R) = 33000 \text{ or } P + Q + R = 16500 \dots \text{(iv)}$$

Subtracting (ii) from (iv), we get $P = 4000$.

P's monthly income = Rs. 4000.

3. The average age of husband, wife and their child 3 years ago was 27 years and that of wife and the child 5 years ago was 20 years. The present age of the husband is:

Answer: 40yrs

Explanation:

Sum of the present ages of husband, wife and child = $(27 \times 3 + 3 \times 3)$ years = 90 years.

Sum of the present ages of wife and child = $(20 \times 2 + 5 \times 2)$ years = 50 years.

Husband's present age = $(90 - 50)$ years = 40 years.

4. A car owner buys petrol at Rs.7.50, Rs. 8 and Rs. 8.50 per litre for three successive years. What approximately is the average cost per litre of petrol if he spends Rs. 4000 each year?

Answer: Rs.7.98

Explanation:

$$\begin{aligned} \text{Total quantity of petrol consumed in 3 years} &= \frac{4000}{7.50} + \frac{4000}{8} + \frac{4000}{8.50} \text{ litres} \\ &= \frac{4000}{15} + \frac{4000}{16} + \frac{4000}{17} \text{ litres} \\ &= \frac{76700}{51} \text{ litres} \end{aligned}$$

Total amount spent = Rs. (3×4000) = Rs. 12000.

$$\text{Average cost} = \text{Rs.} \frac{12000 \times 51}{76700} = \text{Rs.} \frac{6120}{767} = \text{Rs.} 7.98$$

5. In Arun's opinion, his weight is greater than 65 kg but less than 72 kg. His brother does not agree with Arun and he thinks that Arun's weight is greater than 60 kg but less than 70 kg. His mother's view is that his weight cannot be greater than 68 kg. If all are them are correct in their estimation, what is the average of different probable weights of Arun?

Answer: 67kg

Explanation:

Let Arun's weight by X kg.

According to Arun, $65 < X < 72$

According to Arun's brother, $60 < X < 70$.

According to Arun's mother, $X \leq 68$

The values satisfying all the above conditions are 66, 67 and 68.

$$\text{Required average} = \frac{66 + 67 + 68}{3} = \frac{201}{3} = 67 \text{ kg.}$$

6. The average weight of A, B and C is 45 kg. If the average weight of A and B be 40 kg and that of B and C be 43 kg, then the weight of B is:

Answer: 31kg

Explanation:

Let A, B, C represent their respective weights. Then, we have:

$$A + B + C = (45 \times 3) = 135 \dots \text{(i)}$$

$$A + B = (40 \times 2) = 80 \dots \text{(ii)}$$

$$B + C = (43 \times 2) = 86 \dots \text{(iii)}$$

$$\text{Adding (ii) and (iii), we get: } A + 2B + C = 166 \dots \text{(iv)}$$

Subtracting (i) from (iv), we get : $B = 31$.

B's weight = 31 kg.

7. The average weight of 16 boys in a class is 50.25 kg and that of the remaining 8 boys is 45.15 kg. Find the average weights of all the boys in the class.

Answer: 48.55

Explanation:

$$\begin{aligned} \text{Required average} &= \frac{50.25 \times 16 + 45.15 \times 8}{16 + 8} \\ &= \frac{804 + 361.20}{24} \\ &= \frac{1165.20}{24} \\ &= 48.55 \end{aligned}$$

8. A library has an average of 510 visitors on Sundays and 240 on other days. The average number of visitors per day in a month of 30 days beginning with a Sunday is:

Answer: 285

Explanation:

Since the month begins with a Sunday, there will be five Sundays in the month.

$$\begin{aligned} \text{Required average} &= \frac{510 \times 5 + 240 \times 25}{30} \\ &= \frac{8550}{30} \\ &= 285 \end{aligned}$$

9. If the average marks of three batches of 55, 60 and 45 students respectively is 50, 55, 60, then the average marks of all the students is:

Answer: 54.68

Explanation:

$$\begin{aligned}\text{Required average} &= \frac{55 \times 50 + 60 \times 55 + 45 \times 60}{55 + 60 + 45} \\ &= \frac{2750 + 3300 + 2700}{160} \\ &= \frac{8750}{160} \\ &= 54.68\end{aligned}$$

10. A pupil's marks were wrongly entered as 83 instead of 63. Due to that the average marks for the class got increased by half (1/2). The number of pupils in the class is:

Answer: 40

Explanation:

Let there be x pupils in the class.

$$\begin{array}{ccc}\text{Total increase in marks} & = & x \times \frac{1}{2} - \frac{x}{2} \\ & = & \frac{x}{2} \\ x & & x \\ 2 = (83 - 63) & & 2 = 20 & x = 40.\end{array}$$

11. In the first 10 overs of a cricket game, the run rate was only 3.2. What should be the run rate in the remaining 40 overs to reach the target of 282 runs?

Answer: 6.25

Explanation:

$$\begin{array}{ccc}\text{Required run rate} & = & \frac{282 - (3.2 \times 10)}{40} \\ & & = \frac{250}{40} = 6.25\end{array}$$

12. A family consists of grandparents, parents and three grandchildren. The average age of the grandparents is 67 years, that of the parents is 35 years and that of the grandchildren is 6 years. What is the average age of the family?

Answer: 31(5/7)yrs

Explanation:

$$\begin{array}{ccc}\text{Required average} & = & \frac{67 \times 2 + 35 \times 2 + 6 \times 3}{2 + 2 + 3} \\ & & = \frac{134 + 70 + 18}{7} \\ & & = 222\end{array}$$

$$\begin{array}{c}7 \\ = 31 \frac{5}{7} \text{ years.}\end{array}$$

13. A grocer has a sale of Rs. 6435, Rs. 6927, Rs. 6855, Rs. 7230 and Rs. 6562 for 5 consecutive months. How much sale must he have in the sixth month so that he gets an average sale of Rs. 6500?

Answer: Rs.4991

Explanation:

$$\text{Total sale for 5 months} = \text{Rs. } (6435 + 6927 + 6855 + 7230 + 6562) = \text{Rs. } 34009.$$

$$\begin{array}{l}\text{Required sale} = \text{Rs. } [(6500 \times 6) - 34009] \\ = \text{Rs. } (39000 - 34009) \\ = \text{Rs. } 4991.\end{array}$$

14. The average weight of 8 person's increases by 2.5 kg when a new person comes in place of one of them weighing 65 kg. What might be the weight of the new person?

Answer: 85kg

Explanation:

$$\text{Total weight increased} = (8 \times 2.5) \text{ kg} = 20 \text{ kg.}$$

$$\text{Weight of new person} = (65 + 20) \text{ kg} = 85 \text{ kg.}$$

15. The average of 20 numbers is zero. Of them, at the most, how many may be greater than zero?

Answer: 19

Explanation:

$$\text{Average of 20 numbers} = 0.$$

$$\text{Sum of 20 numbers} (0 \times 20) = 0.$$

It is quite possible that 19 of these numbers may be positive and if their sum is a then 20th number is $(-a)$.

AREA

- 1.The diagonal of the floor of a rectangular closet is $7(1/2)$ feet. The shorter side of the closet is $4(1/2)$ feet. What is the area of the closet in square feet?

Answer: 27sq.ft

Explanation:

Other side =

$$\begin{array}{ccc}\text{Sqrt}\{15^2 - 2^2\} & & \text{Sqrt}\{9^2 - 2^2\} \\ & = & \\ } \text{ft} & & \\ & = & \\ & & 225-81\end{array}$$

4 4
ft =
144
4
ft = 6 ft.

Area of closet = (6×4.5) sq. ft = 27 sq. ft.

2. A towel, when bleached, was found to have lost 20% of its length and 10% of its breadth. The percentage of decrease in area is:

Answer: 28%
Explanation:

Let original length = x and original breadth = y .

Decrease in area = $xy - \frac{80}{100}xy = \frac{90}{100}xy$

$$= xy - \frac{18}{25}xy \\ = \frac{7}{25}xy.$$

Decrease % = $\frac{7}{25}xy \times \frac{1}{xy} \times 100\% = 28\%$.

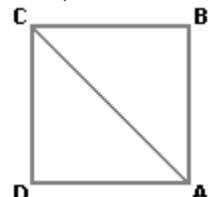
3. A man walked diagonally across a square lot. Approximately, what was the percent saved by not walking along the edges?

Answer: 30%(approx)

Explanation:

Let the side of the square(ABCD) be x metres.

Then, $AB + BC = 2x$ metres.



$AC = \sqrt{2}x = (1.41x)$ m.

Saving on $2x$ metres = $(0.59x)$ m.

Saving % = $\frac{0.59x}{2x} \times 100\% = 30\%$ (approx.)

4. The diagonal of a rectangle is 41 cm and its area is 20 sq. cm. The perimeter of the rectangle must be:

Answer: 18cm

Explanation:
 $\sqrt{I^2 + b^2} = \sqrt{41}$.
Also, $Ib = 20$.
 $(I + b)^2 = (I^2 + b^2) + 2Ib = 41 + 40 = 81$

$(I + b) = 9$.

Perimeter = $2(I + b) = 18$ cm.

5. What is the least number of squares tiles required to pave the floor of a room 15 m 17 cm long and 9 m 2 cm broad?

Answer: 814

Explanation:

Length of largest tile = H.C.F. of 1517 cm and 902 cm = 41 cm.

Area of each tile = (41×41) cm².

$$\text{Required number of tiles} = \frac{1517 \times 902}{41 \times 41} = 814.$$

6. The difference between the length and breadth of a rectangle is 23 m. If its perimeter is 206 m, then its area is:

Answer: 2520 m²

Explanation:

We have: $(I - b) = 23$ and $2(I + b) = 206$ or $(I + b) = 103$.

Solving the two equations, we get: $I = 63$ and $b = 40$.

Area = $(I \times b) = (63 \times 40)$ m² = 2520 m².

7. The length of a rectangle is halved, while its breadth is tripled. What is the percentage change in area?

Answer: 50%

Explanation:

Let original length = x and original breadth = y .

Original area = xy .

New length = $\frac{x}{2}$

New breadth = $3y$.

New area = $\frac{x}{2} \times 3y = \frac{3}{2}xy$.

Increase % = $\frac{\frac{3}{2}xy - xy}{xy} \times 100\% = 50\%$.

8. The length of a rectangular plot is 20 metres more than its breadth. If the cost of fencing the plot @ 26.50 per metre is Rs. 5300, what is the length of the plot in metres?

Answer: 60m

Explanation:

Let breadth = x metres.

Then, length = $(x + 20)$ metres.

$$\text{Perimeter} = \frac{5300}{26.50} \text{ m} = 200 \text{ m.}$$

$$2[(x + 20) + x] = 200$$

$$2x + 20 = 100$$

$$2x = 80$$

$$x = 40.$$

Hence, length = $x + 20 = 60$ m.

9. A rectangular field is to be fenced on three sides leaving a side of 20 feet uncovered. If the area of the field is 680 sq. feet, how many feet of fencing will be required?

Answer: 88ft

Explanation:

We have: $l = 20$ ft and $lb = 680$ sq. ft.

So, $b = 34$ ft.

$$\text{Length of fencing} = (l + 2b) = (20 + 68) \text{ ft} = 88 \text{ ft.}$$

10. A tank is 25 m long, 12 m wide and 6 m deep. The cost of plastering its walls and bottom at 75 paise per sq. m, is:

Answer: Rs.558

Explanation:

$$\begin{aligned} \text{Area to be plastered} &= [2(l+b) \times h] + (l \times b) \\ &= \{[2(25+12) \times 6] + (25 \times 12)\} \text{ m}^2 \\ &= (444 + 300) \text{ m}^2 \\ &= 744 \text{ m}^2. \end{aligned}$$

$$\text{Cost of plastering} = \text{Rs. } \frac{744 \times 75}{100} = \text{Rs. } 558.$$

11. The ratio between the length and the breadth of a rectangular park is 3 : 2. If a man cycling along the boundary of the park at the speed of 12 km/hr completes one round in 8 minutes, then the area of the park (in sq. m) is:

Answer: 153600 m²

Explanation:

$$\text{Perimeter} = \text{Distance covered in 8 min.} = 12000 \times 8$$

60

Let length = $3x$ metres and breadth = $2x$ metres.

Then, $2(3x + 2x) = 1600$ or $x = 160$.

Length = 480 m and Breadth = 320 m.

$$\text{Area} = (480 \times 320) \text{ m}^2 = 153600 \text{ m}^2.$$

12. A rectangular park 60 m long and 40 m wide has two concrete crossroads running in the middle of the park and rest of the park has been used as a lawn. If the area of the lawn is 2109 sq. m, then what is the width of the road?

Answer: x=3

Explanation:

$$\text{Area of the park} = (60 \times 40) \text{ m}^2 = 2400 \text{ m}^2.$$

$$\text{Area of the lawn} = 2109 \text{ m}^2.$$

$$\text{Area of the crossroads} = (2400 - 2109) \text{ m}^2 = 291 \text{ m}^2.$$

Let the width of the road be x metres. Then,

$$60x + 40x - x^2 = 291$$

$$x^2 - 100x + 291 = 0$$

$$(x - 97)(x - 3) = 0$$

$$x = 3.$$

13. The ratio between the perimeter and the breadth of a rectangle is 5 : 1. If the area of the rectangle is 216 sq. cm, what is the length of the rectangle?

Answer: 18cm

Explanation:

$$\begin{matrix} 2(l+b) & 5 \\ b & = 1 \end{matrix}$$

$$2l + 2b = 5b$$

$$3b = 2l$$

$$b = \frac{2}{3}l$$

$$\text{Then, Area} = 216 \text{ cm}^2$$

$$l \times b = 216$$

$$2l = 216$$

$$P = 324$$

$$l = 18 \text{ cm.}$$

14. An error 2% in excess is made while measuring the side of a square. The percentage of error in the calculated area of the square is:

Answer: 4.04%

Explanation:

100 cm is read as 102 cm.

$$A_1 = (100 \times 100) \text{ cm}^2 \text{ and } A_2 (102 \times 102) \text{ cm}^2.$$

$$\begin{aligned} (A_2 - A_1) &= [(102)^2 - (100)^2] \\ &= (102 + 100) \times (102 - 100) \\ &= 404 \text{ cm}^2. \end{aligned}$$

$$\text{Percentage error} = \frac{404}{100 \times 100} \times 100\% = 4.04\%$$

15. The percentage increase in the area of a rectangle, if each of its sides is increased by 20% is:

Answer: 44%

Explanation:

Let original length = x metres and original breadth = y metres.

$$\text{Original area} = (xy) \text{ m}^2.$$

$$\text{New length} = \frac{120}{100}x \text{ m} = \frac{6}{5}x \text{ m.}$$

$$\text{New breadth} = \frac{120}{100}y \text{ m} = \frac{6}{5}y \text{ m.}$$

$$\text{New Area} = \frac{6}{5}x \frac{6}{5}y \text{ m}^2 = \frac{36}{25}xy \text{ m}^2.$$

The difference between the original area = xy and new-area $\frac{36}{25}xy$ is

$$= \left(\frac{36}{25}\right)xy - xy$$

$$= xy\left(\frac{36}{25} - 1\right)$$

$$= xy\left(\frac{11}{25}\right) \text{ or } \left(\frac{11}{25}\right)xy$$

$$\text{Increase \%} = \frac{\frac{11}{25}xy \times \frac{1}{xy} \times 100}{xy} \% = 44\%.$$

RACES AND GAMES

1. In a race of 200 m, A can beat B by 31 m and C by 18 m. In a race of 350 m, C will beat B by:

Answer: 25m

Explanation:

$$A : B = 200 : 169.$$

$$A : C = 200 : 182.$$

$$\frac{C}{B} = \frac{C \times A}{A \times B} = \frac{182 \times 200}{200 \times 169} = 182 : 169.$$

When C covers 182 m, B covers 169 m.

$$\text{When C covers 350 m, B covers } \frac{169}{182} \times 350 \text{ m} = 325 \text{ m.}$$

Therefore, C beats B by $(350 - 325)$ m = 25 m.

2. In 100 m race, A covers the distance in 36 seconds and B in 45 seconds. In this race A beats B by:

Answer: 20m

Explanation:

$$\text{Distance covered by B in 9 sec.} = \frac{100}{45} \times 9 \text{ m} = 20 \text{ m.}$$

A beats B by 20 metres.

3. In a game of 100 points, A can give B 20 points and C 28 points. Then, B can give C:

Answer: 10

Explanation:

$$A : B = 100 : 80.$$

$$A : C = 100 : 72.$$

$$\frac{B}{C} = \frac{B \times A}{A \times C} = \frac{80 \times 100}{100 \times 72} = \frac{10}{9} = \frac{100}{90} = 100 : 90.$$

B can give C 10 points.

4. In a 200 metres race A beats B by 35 m or 7 seconds. A's time over the course is:

Answer: 33sec

Explanation:

B runs 35 m in 7 sec.

$$\text{B covers 200 m in } \frac{7}{35} \times 200 \text{ sec.} = 40 \text{ sec.}$$

B's time over the course = 40 sec.

A's time over the course (40 - 7) sec = 33 sec.

5. A can run 22.5 m while B runs 25 m. In a kilometre race B beats A by:

Answer: 100m

Explanation:

When B runs 25 m, A runs $\frac{45}{2}$ m.

$$\text{When B runs 1000 m, A runs } \frac{45}{2} \times \frac{1}{25} \times 1000 = 900 \text{ m.}$$

B beats A by 100 m.

6. In a 300 m race A beats B by 22.5 m or 6 seconds. B's time over the course is:

Answer: 80sec

Explanation:

B runs $\frac{45}{2}$ m in 6 sec.

$$\text{B covers 300 m in } 6 \times \frac{2}{45} \times 300 = 80 \text{ sec.}$$

7. A runs $1\frac{2}{3}$ times as fast as B. If A gives B a start of 80 m, how far must the winning post be so that A and B might reach it at the same time?

Answer: 200m

Explanation:

Ratio of the speeds of A and B $= \frac{5}{3}$: 1 = 5 : 3.

Thus, in race of 5 m, A gains 2 m over B.

2 m are gained by A in a race of 5 m.

$$80 \text{ m will be gained by A in race of } \frac{5}{2} \times 80 = 200 \text{ m.}$$

Winning post is 200 m away from the starting point.

8. In a 100 m race, A can beat B by 25 m and B can beat C by 4 m. In the same race, A can beat C by:

Answer: 28m

Explanation:

A : B = 100 : 75

B : C = 100 : 96.

$$AxB = 100 \times 100 = 100 = 100 : 72.$$

A beats C by (100 - 72) m = 28 m.

9. At a game of billiards, A can give B 15 points in 60 and A can give C to 20 points in 60. How many points can B give C in a game of 90?

Answer: 10

Explanation:

A : B = 60 : 45.

A : C = 60 : 40.

$$\frac{B}{C} = \frac{B}{A} \times \frac{A}{C} = \frac{45}{60} \times \frac{60}{40} = \frac{45}{40} = \frac{90}{80} = 90 : 80.$$

B can give C 10 points in a game of 90.

10. In a 100 m race, A beats B by 10 m and C by 13 m. In a race of 180 m, B will beat C by:

Answer: 6m

Explanation:

A : B = 100 : 90.

A : C = 100 : 87.

$$\frac{B}{C} = \frac{B}{A} \times \frac{A}{C} = \frac{90}{100} \times \frac{100}{87} = \frac{90}{87} = \frac{30}{29}.$$

When B runs 30 m, C runs 29 m.

$$\text{When B runs 180 m, C runs } \frac{29}{30} \times 180 = 174 \text{ m.}$$

B beats C by (180 - 174) m = 6 m.

11. In a 500 m race, the ratio of the speeds of two contestants A and B is 3 : 4. A has a start of 140 m. Then, A wins by:

Answer: 20m

Explanation:

To reach the winning post A will have to cover a distance of (500 - 140)m, i.e., 360 m.

While A covers 3 m, B covers 4 m.

$$\text{While A covers 360 m, B covers } \frac{4}{3} \times 360 = 480 \text{ m.}$$

Thus, when A reaches the winning post, B covers 480 m and therefore remains 20 m behind.

A wins by 20 m.

12. A and B take part in 100 m race. A runs at 5 kmph. A gives B a start of 8 m and still beats him by 8 seconds. The speed of B is:

Answer: 4.14kmph

Explanation:

$$A's \text{ speed} = \frac{5}{18} \text{ m/sec} = \frac{25}{18} \text{ m/sec.}$$

$$\text{Time taken by A to cover } 100 \text{ m} = \frac{100}{\frac{25}{18}} \text{ sec.} = 72 \text{ sec.}$$

$$\text{Time taken by B to cover } 92 \text{ m} = (72 + 8) = 80 \text{ sec.}$$

$$B's \text{ speed} = \frac{92}{80} \times \frac{18}{5} \text{ kmph} = 4.14 \text{ kmph.}$$

13.In a 100 m race, A can give B 10 m and C 28 m. In the same race B can give C:

Answer: 20m

Explanation:

$$A : B = 100 : 90.$$

$$A : C = 100 : 72.$$

$$B : C = \frac{B}{A} : \frac{C}{A} = \frac{90}{100} : \frac{72}{72} = 90 : 72.$$

When B runs 90 m, C runs 72 m.

$$\text{When B runs } 100 \text{ m, C runs } \frac{72}{90} \times 100 \text{ m.} = 80 \text{ m.}$$

B can give C 20 m.

BOATS AND STREAMS

1.A boat running downstream covers a distance of 16 km in 2 hours while for covering the same distance upstream, it takes 4 hours. What is the speed of the boat in still water?

Answer: 6kmph

Explanation:

$$\text{Rate downstream} = \frac{16}{2} \text{ kmph} = 8 \text{ kmph.}$$

$$\text{Rate upstream} = \frac{16}{4} \text{ kmph} = 4 \text{ kmph.}$$

$$\text{Speed in still water} = \frac{1}{2}(8 + 4) \text{ kmph} = 6 \text{ kmph.}$$

2. The speed of a boat in still water is 15 km/hr and the rate of current is 3 km/hr. The distance travelled downstream in 12 minutes is:

Answer: 3.6m

Explanation:

$$\text{Speed downstream} = (15 + 3) \text{ kmph} = 18 \text{ kmph.}$$

$$\text{Distance travelled} = \frac{18}{60} \text{ km} = 3.6 \text{ km.}$$

3. A boat takes 90 minutes less to travel 36 miles downstream than to travel the same distance upstream. If the speed of the boat in still water is 10 mph, the speed of the stream is:

Answer: 2mph

Explanation:

$$\text{Let the speed of the stream } x \text{ mph. Then,}$$

$$\text{Speed downstream} = (10 + x) \text{ mph,}$$

$$\text{Speed upstream} = (10 - x) \text{ mph.}$$

$$\frac{36}{(10 - x)} - \frac{36}{(10 + x)} = 60$$

$$72x \times 60 = 90(100 - x^2)$$

$$x^2 + 48x - 100 = 0$$

$$(x+50)(x-2) = 0$$

$$x = 2 \text{ mph.}$$

4. A man can row at 5 kmph in still water. If the velocity of current is 1 kmph and it takes him 1 hour to row to a place and come back, how far is the place?

Answer: 2.4km

Explanation:

$$\text{Speed downstream} = (5 + 1) \text{ kmph} = 6 \text{ kmph.}$$

$$\text{Speed upstream} = (5 - 1) \text{ kmph} = 4 \text{ kmph.}$$

Let the required distance be x km.

$$\text{Then, } \frac{x}{6} + \frac{x}{4} = 1$$

$$2x + 3x = 12$$

$$5x = 12$$

$$x = 2.4 \text{ km.}$$

5. A boat covers a certain distance downstream in 1 hour, while it comes back in 1(1/2) hours. If the speed of the stream be 3 kmph, what is the speed of the boat in still water?

Answer: 15kmph

Explanation:

Let the speed of the boat in still water be x kmph. Then,

$$\text{Speed downstream} = (x + 3) \text{ kmph},$$

$$\text{Speed upstream} = (x - 3) \text{ kmph}.$$

3

$$(x + 3) \times 1 = (x - 3) x^2$$

$$2x + 6 = 3x - 9$$

$$x = 15 \text{ kmph.}$$

6. A boatman goes 2 km against the current of the stream in 1 hour and goes 1 km along the current in 10 minutes. How long will it take to go 5 km in stationary water?

Answer: 1hr15min

Explanation:

$$\text{Rate downstream} = \frac{1}{10} \times 60 \text{ km/hr} = 6 \text{ km/hr.}$$

$$\text{Rate upstream} = 2 \text{ km/hr.}$$

$$\text{Speed in still water} = \frac{1}{2}(6 + 2) \text{ km/hr} = 4 \text{ km/hr.}$$

$$\text{Required time} = \frac{5}{4} \text{ hrs} = 1\frac{1}{4} \text{ hrs} = 1 \text{ hr } 15 \text{ min.}$$

7. A man can row three-quarters of a kilometre against the stream in 11(1/4) minutes and down the stream in 7(1/2) minutes. The speed (in km/hr) of the man in still water is:

Answer: 5km/hr

Explanation:

We can write three-quarters of a kilometre as 750 metres, and 11(1/4) minutes as 675 seconds.

$$\text{Rate upstream} = \frac{750}{675} \text{ m/sec} = \frac{10}{9} \text{ m/sec.}$$

$$\text{Rate downstream} = \frac{750}{450} \text{ m/sec} = \frac{5}{3} \text{ m/sec.}$$

$$\text{Rate in still water} = \frac{1}{2} \left(\frac{10}{9} + \frac{5}{3} \right) \text{ m/sec}$$

$$= \frac{25}{18} \text{ m/sec}$$

$$= \frac{25}{18} \times \frac{18}{5} \text{ km/hr}$$

$$= 5 \text{ km/hr.}$$

- 8.. Speed of a boat in standing water is 9 kmph and the speed of the stream is 1.5 kmph. A man rows to a place at a distance of 105 km and comes back to the starting point. The total time taken by him is:

Answer: 24hrs

Explanation:

$$\text{Speed upstream} = 7.5 \text{ kmph.}$$

$$\text{Speed downstream} = 10.5 \text{ kmph.}$$

$$\text{Total time taken} = \frac{105}{7.5} + \frac{105}{10.5} \text{ hours} = 24 \text{ hours.}$$

9. A man takes twice as long to row a distance against the stream as to row the same distance in favour of the stream. The ratio of the speed of the boat (in still water) and the stream is:

Answer: 3:1

Explanation:

$$\text{Let man's rate upstream be } x \text{ kmph.}$$

$$\text{Then, his rate downstream} = 2x \text{ kmph.}$$

$$\begin{array}{c} 2x+x \\ \text{(Speed in still water)} : \text{(Speed of stream)} = \\ 2 \\ \hline 3x \\ = 2 \\ \hline 3 : 1 \end{array} \quad : \quad \begin{array}{c} 2x-x \\ 2 \\ \hline 2 \end{array}$$

10. A man rows to a place 48 km distant and come back in 14 hours. He finds that he can row 4 km with the stream in the same time as 3 km against the stream. The rate of the stream is:

Answer: 1km/hr

Explanation:

Suppose he move 4 km downstream in x hours. Then,

$$\text{Speed downstream} = \frac{4}{x} \text{ km/hr.}$$

$$\text{Speed upstream} = \frac{3}{x} \text{ km/hr.}$$

$$\frac{48}{(4/x)} + \frac{48}{(3/x)} = 14 \text{ or } x = 2.$$

So, Speed downstream = 8 km/hr, Speed upstream = 6 km/hr.

$$\text{Rate of the stream} = \frac{1}{2}(8 - 6) \text{ km/hr} = 1 \text{ km/hr.}$$

- 11.A boat can travel with a speed of 13 km/hr in still water. If the speed of the stream is 4 km/hr, find the time taken by the boat to go 68 km downstream.

Answer: 4hrs

Explanation:

Speed downstream = $(13 + 4)$ km/hr = 17 km/hr.

$$\begin{array}{rcl} \text{Time taken to travel } 68 \text{ km downstream} & = & 68 \\ & & 17 \quad \text{hrs} = 4 \text{ hrs.} \end{array}$$

12. A man's speed with the current is 15 km/hr and the speed of the current is 2.5 km/hr. The man's speed against the current is:

Answer: 10km/hr

Explanation:

Man's rate in still water = $(15 - 2.5)$ km/hr = 12.5 km/hr.

Man's rate against the current = $(12.5 - 2.5)$ km/hr = 10 km/hr.

13. A boat running upstream takes 8 hours 48 minutes to cover a certain distance, while it takes 4 hours to cover the same distance running downstream. What is the ratio between the speed of the boat and speed of the water current respectively?

Answer: 8:3

Explanation:

Let the man's rate upstream be x kmph and that downstream be y kmph.

Then, distance covered upstream in 8 hrs 48 min = Distance covered downstream in 4 hrs.

$$x \times 8 \frac{4}{5} = (y \times 4)$$

$$\frac{44}{5}x = 4y$$

$$\frac{11}{5}x$$

$$y = \frac{5}{4}x$$

$$\begin{array}{ccc} y+x & : & y-x \\ 2 & : & 2 \end{array}$$

Required ratio =

$$= \frac{16x}{5} : \frac{6x}{5}$$

$$= \frac{8}{5} : \frac{3}{5}$$

= 8 : 3.

14. A motorboat, whose speed in 15 km/hr in still water goes 30 km downstream and comes back in a total of 4 hours 30 minutes. The speed of the stream (in km/hr) is:

Answer: 5km/hr

Explanation:

Let the speed of the stream be x km/hr. Then,

Speed downstream = $(15 + x)$ km/hr,

Speed upstream = $(15 - x)$ km/hr.

$$\frac{30}{(15+x)} + \frac{30}{(15-x)} = \frac{4}{2}$$

$$\begin{array}{rcl} 900 & 9 \\ 225 - x^2 & = & 2 \end{array}$$

$$9x^2 = 225$$

$$x^2 = 25$$

$$x = 5 \text{ km/hr.}$$

15. In one hour, a boat goes 11 km/hr along the stream and 5 km/hr against the stream. The speed of the boat in still water (in km/hr) is:

Answer: 8kmph

Explanation:

$$\text{Speed in still water} = \frac{1}{2}(11 + 5) \text{ kmph} = 8 \text{ kmph.}$$

SURDS AND INDICES

1. $(256)^{0.16} \times (256)^{0.09} = ?$

Answer: 4

Explanation:

$$\begin{aligned} (256)^{0.16} \times (256)^{0.09} &= (256)^{(0.16 + 0.09)} \\ &= (256)^{0.25} \\ &= (256)^{(25/100)} \\ &= (256)^{(1/4)} \\ &= (4^4)^{(1/4)} \\ &= 4^{4(1/4)} \\ &= 4^1 \\ &= 4 \end{aligned}$$

2. The value of $[(10)^{150} \div (10)^{146}]$

Answer: 10000

Explanation:

$$\begin{aligned} (10)^{150} \div (10)^{146} &= \frac{10^{150}}{10^{146}} \\ &= 10^{150 - 146} \\ &= 10^4 \\ &= 10000. \end{aligned}$$

3. $1 + 1 + 1 + 1 = ?$

$$1 + x^{(b-a)} + x^{(c-a)} \quad 1 + x^{(a-b)} + x^{(c-b)} \quad 1 + x^{(b-c)} + x^{(a-c)}$$

Answer: 1

Explanation:

$$\begin{aligned} \text{Given Exp.} &= \frac{1}{1 + \frac{x^b}{x^a} + \frac{x^c}{x^a}} + \frac{1}{1 + \frac{x^a}{x^b} + \frac{x^c}{x^b}} + \frac{1}{1 + \frac{x^b}{x^c} + \frac{x^a}{x^c}} \\ &= \frac{x^a}{(x^a + x^b + x^c)} + \frac{x^b}{(x^a + x^b + x^c)} + \frac{x^c}{(x^a + x^b + x^c)} \\ &= \frac{(x^a + x^b + x^c)}{(x^a + x^b + x^c)} \\ &= 1. \end{aligned}$$

4. $(25)^{7.5} \times (5)^{2.5} \div (125)^{1.5} = ?$

Answer: 13

Explanation:

Let $(25)^{7.5} \times (5)^{2.5} \div (125)^{1.5} = 5^x$.

$$\text{Then, } \frac{(5^2)^{7.5} \times (5)^{2.5}}{(5^3)^{1.5}} = 5^x$$

$$\frac{5^{2 \times 7.5} \times 5^{2.5}}{5^{3 \times 1.5}} = 5^x$$

$$\frac{5^{15} \times 5^{2.5}}{5^{4.5}} = 5^x$$

$$5^x = 5^{(15 + 2.5 - 4.5)}$$

$$5^x = 5^{13}$$

$$x = 13.$$

5. $(0.04)^{-1.5} = ?$

Answer: 125

Explanation:

$$\begin{aligned} (0.04)^{-1.5} &= \frac{4}{100}^{-1.5} \\ &= \frac{1}{25}^{-(3/2)} \\ &= (25)^{(3/2)} \\ &= (5^2)^{(3/2)} \\ &= (5)^{2 \times (3/2)} \\ &= 5^3 \end{aligned}$$

$$= 125.$$

$$6. (243)^{n/5} \times 3^{2n+1} = ?$$

Answer: 9

Explanation:

$$\begin{aligned} \text{Given Expression} &= \frac{(243)^{(n/5)} \times 3^{2n+1}}{9^n \times 3^{n-1}} \\ &= \frac{(3^5)^{(n/5)} \times 3^{2n+1}}{(3^2)^n \times 3^{n-1}} \\ &= \frac{(3^5 \times (n/5)) \times 3^{2n+1}}{(3^{2n}) \times 3^{n-1}} \\ &= \frac{3^n \times 3^{2n+1}}{3^{2n} \times 3^{n-1}} \\ &= \frac{3^{(n+2n+1)}}{3^{(2n+n-1)}} \\ &= \frac{3^{3n+1}}{3^{3n-1}} \\ &= 3^{(3n+1 - 3n+1)} = 3^2 = 9. \end{aligned}$$

7. $\frac{1}{1 + a^{(n-m)}} + \frac{1}{1 + a^{(m-n)}} = ?$

Answer: 1

Explanation:

$$\begin{aligned} \frac{1}{1 + a^{(n-m)}} + \frac{1}{1 + a^{(m-n)}} &= \frac{1}{1 + a^n} + \frac{1}{1 + a^m} \\ &= \frac{a^m}{(a^m + a^n)} + \frac{a^n}{(a^m + a^n)} \\ &= \frac{(a^m + a^n)}{(a^m + a^n)} \\ &= 1. \end{aligned}$$

8. If m and n are whole numbers such that $m^n = 121$, the value of $(m-1)^{n+1}$ is:

Answer: 1000

Explanation:

We know that $11^2 = 121$.

Putting $m = 11$ and $n = 2$, we get:

$$(m-1)^{n+1} = (11-1)^{(2+1)} = 10^3 = 1000.$$

9. $\frac{x^b}{x^c} (b+c-a), \quad \frac{x^c}{x^a} (c+a-b), \quad \frac{x^a}{x^b} (a+b-c) = ?$

Answer: 1

Explanation:

$$\text{Given Exp.} = x^{(b-c)(b+c-a)} \cdot x^{(c-a)(c+a-b)} \cdot x^{(a-b)(a+b-c)}$$

$$\begin{aligned} &= x^{(b-c)(b+c)-a(b-c)} \cdot x^{(c-a)(c+a)-b(c-a)} \\ &\quad \cdot x^{(a-b)(a+b)-c(a-b)} \\ &= x^{(b^2-c^2+c^2-a^2+a^2-b^2)} \cdot x^{a(b-c)-b(c-a)-c(a-b)} \end{aligned}$$

$$= (x^0 \times x^0)$$

$$= (1 \times 1) = 1.$$

10. If $x = 3 + 22$, then the value of $x - \frac{1}{x}$ is:

Answer: 2

Explanation:

$$\begin{aligned} &\frac{\sqrt{x}}{\sqrt{x}} - \frac{1}{\sqrt{x}} = x + \frac{1}{x} - 2 \\ &= (3 + 2\sqrt{2}) + \frac{1}{(3 + 2\sqrt{2})^2} - 2 \\ &= (3 + 2\sqrt{2}) + \frac{1}{(3 + 2\sqrt{2})(3 - 2\sqrt{2})} - 2 \\ &= (3 + 2\sqrt{2}) + (3 - 2\sqrt{2}) - 2 \\ &= 4. \\ &\frac{\sqrt{x}}{\sqrt{rx}} - \frac{1}{\sqrt{rx}} = 2. \end{aligned}$$

$$11. (17)^{3.5} \times (17)^? = 17^8$$

Answer: 4.5

Explanation:

$$\text{Let } (17)^{3.5} \times (17)^x = 17^8.$$

$$\text{Then, } (17)^{3.5+x} = 17^8.$$

$$3.5 + x = 8$$

$$x = (8 - 3.5)$$

$$x = 4.5$$

12. Given that $10^{0.48} = x$, $10^{0.70} = y$ and $x^z = y^2$, then the value of z is close to:

Answer: 2.9(approx)

Explanation:

$$x^z = y^2 \quad 10^{(0.48z)} = 10^{(2 \times 0.70)} = 10^{1.40}$$

$$\begin{aligned} 0.48z &= 1.40 \\ \frac{140}{z} &= \frac{35}{12} = 2.9 \text{ (approx.)} \\ z &= 48 \end{aligned}$$

13. If $5^a = 3125$, then the value of $5^{(a-3)}$ is:

Answer: 25

Explanation:

$$5^a = 3125 \quad 5^a = 5^5$$

$$a = 5.$$

$$5^{(a-3)} = 5^{(5-3)} = 5^2 = 25.$$

14. If $3^{(x-y)} = 27$ and $3^{(x+y)} = 243$, then x is equal to:

Answer: 4

Explanation:

$$3^{x-y} = 27 = 3^3 \quad x-y = 3 \dots \text{(i)}$$

$$3^{x+y} = 243 = 3^5 \quad x+y = 5 \dots \text{(ii)}$$

On solving (i) and (ii), we get $x = 4$.

15. If $\frac{a}{b} = \frac{x-1}{a} = \frac{b}{x-3}$, then the value of x is:

Answer: 2

Explanation:

$$\begin{array}{ccccccc} \text{Given} & \frac{a}{b} & x-1 & = & \frac{b}{a} & x-3 \\ & a & b & & a & a \\ & \frac{a}{b} & x-1 & = & \frac{a}{b} & -(x-3) & = & \frac{a}{b} \\ & & & & & & & (3-x) \end{array}$$

$$x-1 = 3-x$$

$$2x = 4$$

$$x = 2.$$

PIPES AND CISTERNS

1. Two pipes can fill a tank in 20 and 24 minutes respectively and a waste pipe can empty 3 gallons per minute. All the three pipes working together can fill the tank in 15 minutes. The capacity of the tank is:

Answer: 120 gallons

Explanation:

$$\begin{aligned} \text{Work done by the waste pipe in 1 minute} &= \frac{1}{15} - \frac{1}{20} + \frac{1}{24} \\ &= \frac{1}{15} - \frac{1}{120} \\ &= -\frac{1}{40}. \quad [\text{-ve sign means emptying}] \end{aligned}$$

$$\text{Volume of } \frac{1}{40} \text{ part} = 3 \text{ gallons.}$$

$$\text{Volume of whole} = (3 \times 40) \text{ gallons} = 120 \text{ gallons.}$$

2. A tank is filled in 5 hours by three pipes A, B and C. The pipe C is twice as fast as B and B is twice as fast as A. How much time will pipe A alone take to fill the tank?

Answer: 35 hrs

Explanation:

Suppose pipe A alone takes x hours to fill the tank.

Then, pipes B and C will take $\frac{x}{2}$ and $\frac{x}{4}$ hours respectively to fill the tank.

$$\begin{aligned} \frac{1}{x} + \frac{1}{\frac{x}{2}} + \frac{1}{\frac{x}{4}} &= 1 \\ \frac{1}{x} + \frac{2}{x} + \frac{4}{x} &= 1 \\ \frac{7}{x} &= 1 \\ x &= 7 \end{aligned}$$

$$x = 35 \text{ hrs.}$$

3. Two pipes A and B together can fill a cistern in 4 hours. Had they been opened separately, then B would have taken 6 hours more than A to fill the cistern. How much time will be taken by A to fill the cistern separately?

Answer: 6

Explanation:

Let the cistern be filled by pipe A alone in x hours.

Then, pipe B will fill it in $(x+6)$ hours.

$$\frac{1}{x} + \frac{1}{x+6} = 1$$

$$\begin{aligned} x(x+6) &= 4 \\ x+6+x &= 1 \\ x(x+6) &= 4 \end{aligned}$$

$$x^2 - 2x - 24 = 0$$

$$(x-6)(x+4) = 0$$

$$x = 6. \quad [\text{neglecting the negative value of } x]$$

4. Two pipes A and B can fill a tank in 20 and 30 minutes respectively. If both the pipes are used together, then how long will it take to fill the tank?

Answer: 12 min

Explanation:

$$\text{Part filled by A in 1 min} = \frac{1}{20}$$

$$\text{Part filled by B in 1 min} = \frac{1}{30}$$

$$\text{Part filled by (A + B) in 1 min} = \frac{1}{20} + \frac{1}{30} = \frac{1}{12}$$

Both pipes can fill the tank in 12 minutes.

5. Two pipes A and B can fill a tank in 15 minutes and 20 minutes respectively. Both the pipes are opened together but after 4 minutes, pipe A is turned off. What is the total time required to fill the tank?

Answer: 14 min 40 sec

Explanation:

$$\text{Part filled in 4 minutes} = 4 \cdot \frac{1}{15} + \frac{1}{20} = \frac{7}{15}$$

$$\text{Remaining part} = 1 - \frac{7}{15} = \frac{8}{15}$$

$$\text{Part filled by B in 1 minute} = \frac{1}{20}$$

$$\frac{1}{20} : \frac{8}{15} :: 1 : x$$

$$x = \frac{8}{15} \times \frac{1}{20} \times 20 = \frac{8}{3} \text{ min} = 10 \text{ min. 40 sec.}$$

The tank will be full in $(4 \text{ min.} + 10 \text{ min.} + 40 \text{ sec.}) = 14 \text{ min. 40 sec.}$

6. One pipe can fill a tank three times as fast as another pipe. If together the two pipes can fill the tank in 36 minutes, then the slower pipe alone will be able to fill the tank in:

Answer: 144min

Explanation:

Let the slower pipe alone fill the tank in x minutes.

Then, faster pipe will fill it in $\frac{x}{3}$ minutes.

$$\begin{array}{r} 1 \ 3 \ 1 \\ x \ x \ 36 \\ + \quad \quad \quad \\ \hline 4 \ 1 \\ x \ 36 \end{array}$$

$$x = 144 \text{ min.}$$

7. A large tanker can be filled by two pipes A and B in 60 minutes and 40 minutes respectively. How many minutes will it take to fill the tanker from empty state if B is used for half the time and A and B fill it together for the other half?

Answer: 30min

Explanation:

$$\text{Part filled by } (A + B) \text{ in 1 minute} = \frac{1}{60} + \frac{1}{40} = \frac{1}{24}$$

Suppose the tank is filled in x minutes.

$$\text{Then, } \frac{x}{2} \left(\frac{1}{24} + \frac{1}{40} \right) = 1$$

$$\frac{x}{2} \times \frac{1}{15} = 1$$

$$x = 30 \text{ min.}$$

8. A tap can fill a tank in 6 hours. After half the tank is filled, three more similar taps are opened. What is the total time taken to fill the tank completely?

Answer: 3hrs45min

Explanation:

Time taken by one tap to fill **half of the tank** = 3 hrs.

$$\text{Part filled by the four taps in 1 hour} = 4 \times \frac{1}{6} = \frac{2}{3}$$

$$\text{Remaining part} = 1 - \frac{1}{2} = \frac{1}{2}$$

$$\frac{2}{3} : 1 :: 1 : x$$

$$x = \frac{1}{2} \times 1 \times \frac{3}{2} = \frac{3}{4} \text{ hours i.e., 45 mins.}$$

So, total time taken = 3 hrs. 45 mins.

9. Three taps A, B and C can fill a tank in 12, 15 and 20 hours respectively. If A is open all the time and B and C are open for one hour each alternately, the tank will be full in:

Answer: 7hrs

Explanation:

$$(A + B)'s \text{ 1 hour's work} = \frac{1}{12} + \frac{1}{15} = \frac{9}{60} = \frac{3}{20}$$

$$(A + C)'s \text{ hour's work} = \frac{1}{12} + \frac{1}{20} = \frac{8}{60} = \frac{2}{15}$$

$$\text{Part filled in 2 hrs} = \frac{3}{20} + \frac{2}{15} = \frac{17}{60}$$

$$\text{Part filled in 6 hrs} = 3 \times \frac{17}{60} = \frac{17}{20}$$

$$\text{Remaining part} = 1 - \frac{17}{20} = \frac{3}{20}$$

Now, it is the turn of A and B and $\frac{3}{20}$ part is filled by A and B in 1 hour.

Total time taken to fill the tank = (6 + 1) hrs = 7 hrs.

10. Three pipes A, B and C can fill a tank in 6 hours. After working at it together for 2 hours, C is closed and A and B can fill the remaining part in 7 hours. The number of hours taken by C alone to fill the tank is:

Answer: 14hrs

Explanation:

$$\text{Part filled in 2 hours} = \frac{2}{6} = \frac{1}{3}$$

$$\text{Remaining part} = 1 - \frac{1}{3} = \frac{2}{3}$$

$$(A + B)'s \text{ 7 hour's work} = \frac{2}{3}$$

$$(A + B)'s \text{ 1 hour's work} = \frac{2}{21}$$

$$\begin{aligned} C's \text{ 1 hour's work} &= \{ (A + B + C)'s \text{ 1 hour's work} \} - \{ (A + B)'s \text{ 1 hour's work} \} \\ &= \frac{1}{6} - \frac{2}{21} = \frac{1}{14} \end{aligned}$$

C alone can fill the tank in 14 hours.

11. Three pipes A, B and C can fill a tank from empty to full in 30 minutes, 20 minutes, and 10 minutes respectively. When the tank is empty, all the three pipes are opened. A, B and C

discharge chemical solutions P, Q and R respectively. What is the proportion of the solution R in the liquid in the tank after 3 minutes?

Answer: 6/11

Explanation:

$$\text{Part filled by } (A + B + C) \text{ in 3 minutes} = 3 \quad \frac{1}{30} + \frac{1}{20} + \frac{1}{10} = 3 \times \frac{11}{60} = \frac{11}{20}$$

$$\text{Part filled by } C \text{ in 3 minutes} = \frac{3}{10}$$

$$\frac{3}{10} : \frac{20}{11} = 6 : 11$$

Required ratio =

12.A tank is filled by three pipes with uniform flow. The first two pipes operating simultaneously fill the tank in the same time during which the tank is filled by the third pipe alone. The second pipe fills the tank 5 hours faster than the first pipe and 4 hours slower than the third pipe. The time required by the first pipe is:

Answer: 15

Explanation:

Suppose, first pipe alone takes x hours to fill the tank .

Then, second and third pipes will take $(x - 5)$ and $(x - 9)$ hours respectively to fill the tank.

$$\begin{aligned} \frac{1}{x} + \frac{1}{x-5} &= \frac{1}{x-9} \\ x - 5 + x &= 1 \\ x(x-5) &= (x-9) \end{aligned}$$

$$(2x-5)(x-9) = x(x-5)$$

$$x^2 - 18x + 45 = 0$$

$$(x-15)(x-3) = 0$$

$$x = 15. \quad [\text{neglecting } x=3]$$

13.A pump can fill a tank with water in 2 hours. Because of a leak, it took 2 hours to fill the tank. The leak can drain all the water of the tank in:

Answer: 14hrs

Explanation:

$$\text{Work done by the leak in 1 hour} = \frac{1}{2} - \frac{3}{7} = \frac{1}{14}$$

Leak will empty the tank in 14 hrs.

14.Two pipes A and B can fill a cistern in 37 minutes and 45 minutes respectively. Both pipes are opened. The cistern will be filled in just half an hour, if the B is turned off after:

Answer: 9

Explanation:

Let B be turned off after x minutes. Then,

Part filled by $(A + B)$ in x min. + Part filled by A in $(30 - x)$ min. = 1.

$$\begin{aligned} \frac{2}{x} + \frac{1}{75} + \frac{45}{(30-x)} &= \frac{2}{75} \\ 11x + (60-2x) &= 1 \\ 225 &= 75 \end{aligned}$$

$$11x + 180 - 6x = 225.$$

$$x = 9.$$

15.Pipes A and B can fill a tank in 5 and 6 hours respectively. Pipe C can empty it in 12 hours. If all the three pipes are opened together, then the tank will be filled in:

Answer: 3(9/17)hrs

Explanation:

$$\begin{aligned} \text{Net part filled in 1 hour} &= \frac{1}{5} + \frac{1}{6} - \frac{1}{12} = \frac{17}{60} \\ &= \frac{9}{17} \text{ hours i.e., } 3 \frac{9}{17} \text{ hours.} \end{aligned}$$

The tank will be full in 17

CALENDAR

1.If 6th March, 2005 is Monday, what was the day of the week on 6th March, 2004?

Answer: sunday

Explanation:

The year 2004 is a leap year. So, it has 2 odd days.

But, Feb 2004 not included because we are calculating from March 2004 to March 2005. So it has 1 odd day only.

The day on 6th March, 2005 will be 1 day beyond the day on 6th March, 2004.

Given that, 6th March, 2005 is Monday.

6th March, 2004 is Sunday (1 day before to 6th March, 2005).

2. On what dates of April, 2001 did Wednesday fall?

Answer: In April, 2001 Wednesday falls on 4th, 11th, 18th and 25th.

Explanation:

We shall find the day on 1st April, 2001.

1st April, 2001 = (2000 years + Period from 1.1.2001 to 1.4.2001)

Odd days in 1600 years = 0

Odd days in 400 years = 0

Jan. Feb. March April

$(31 + 28 + 31 + 1) = 91$ days 0 odd days.

Total number of odd days = $(0 + 0 + 0) = 0$

On 1st April, 2001 it was Sunday.

In April, 2001 Wednesday falls on 4th, 11th, 18th and 25th.

3. How many days are there in x weeks x days?

Answer: $8x$ days

Explanation:

x weeks x days = $(7x + x)$ days = $8x$ days.

4. The last day of a century cannot be

Answer: Tuesday or Thursday or Saturday

Explanation:

100 years contain 5 odd days.

Last day of 1st century is Friday.

200 years contain (5×2) 3 odd days.

Last day of 2nd century is Wednesday.

300 years contain $(5 \times 3) = 15$ 1 odd day.

Last day of 3rd century is Monday.

400 years contain 0 odd day.

Last day of 4th century is Sunday.

This cycle is repeated.

Last day of a century cannot be Tuesday or Thursday or Saturday.

5. On 8th Feb, 2005 it was Tuesday. What was the day of the week on 8th Feb, 2004?

Answer: Sunday

Explanation:

The year 2004 is a leap year. It has 2 odd days.

The day on 8th Feb, 2004 is 2 days before the day on 8th Feb, 2005.

Hence, this day is Sunday.

6. The calendar for the year 2007 will be the same for the year:

Answer: 2018

Explanation:

Count the number of odd days from the year 2007 onwards to get the sum equal to 0 odd day.

Year : 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017

Odd day : 1 2 1 1 1 2 1 1 1 2 1

Sum = 14 odd days 0 odd days.

Calendar for the year 2018 will be the same as for the year 2007.

7. Which of the following is not a leap year?

Answer: 700

Explanation:

The century divisible by 400 is a leap year.

The year 700 is not a leap year.

8. On 8th Dec, 2007 Saturday falls. What day of the week was it on 8th Dec, 2006?

Answer: Friday

Explanation:

The year 2006 is an ordinary year. So, it has 1 odd day.

So, the day on 8th Dec, 2007 will be 1 day beyond the day on 8th Dec, 2006.

But, 8th Dec, 2007 is Saturday.

8th Dec, 2006 is Friday.

9. January 1, 2008 is Tuesday. What day of the week lies on Jan 1, 2009?

Answer: Thursday

Explanation:

The year 2008 is a leap year. So, it has 2 odd days.

1st day of the year 2008 is Tuesday (Given)

So, 1st day of the year 2009 is 2 days beyond Tuesday.

Hence, it will be Thursday.

10. January 1, 2007 was Monday. What day of the week lies on Jan. 1, 2008?

Answer: Tuesday

Explanation:

The year 2007 is an ordinary year. So, it has 1 odd day.

1st day of the year 2007 was Monday.

1st day of the year 2008 will be 1 day beyond Monday.

Hence, it will be Tuesday.

11. Today is Monday. After 61 days, it will be:

Answer: Saturday.

Explanation:

Each day of the week is repeated after 7 days.

So, after 63 days, it will be Monday.

After 61 days, it will be Saturday.

12. What will be the day of the week 15th August, 2010?

Answer: Sunday

Explanation:

15th August, 2010 = (2009 years + Period 1.1.2010 to 15.8.2010)

Odd days in 1600 years = 0

Odd days in 400 years = 0

$$9 \text{ years} = (2 \text{ leap years} + 7 \text{ ordinary years}) = (2 \times 2 + 7 \times 1) = 11 \text{ odd days} \quad 4 \text{ odd days.}$$

Jan. Feb. March April May June July Aug.

$$(31 + 28 + 31 + 30 + 31 + 30 + 31 + 15) = 227 \text{ days}$$

$$227 \text{ days} = (32 \text{ weeks} + 3 \text{ days}) \quad 3 \text{ odd days.}$$

$$\text{Total number of odd days} = (0 + 0 + 4 + 3) = 7 \quad 0 \text{ odd days.}$$

Given day is Sunday.

13. What was the day of the week on 17th June, 1998?

Answer: Wednesday.

Explanation:

17th June, 1998 = (1997 years + Period from 1.1.1998 to 17.6.1998)

Odd days in 1600 years = 0

Odd days in 300 years = (5 x 3) 1

97 years has 24 leap years + 73 ordinary years.

Number of odd days in 97 years (24 x 2 + 73) = 121 = 2 odd days.

Jan. Feb. March April May June

$$(31 + 28 + 31 + 30 + 31 + 17) = 168 \text{ days}$$

$$168 \text{ days} = 24 \text{ weeks} = 0 \text{ odd day.}$$

$$\text{Total number of odd days} = (0 + 1 + 2 + 0) = 3.$$

Given day is Wednesday.

14. It was Sunday on Jan 1, 2006. What was the day of the week Jan 1, 2010?

Answer: Friday.

Explanation:

On 31st December, 2005 it was Saturday.

Number of odd days from the year 2006 to the year 2009 = (1 + 1 + 2 + 1) = 5 days.

On 31st December 2009, it was Thursday.

Thus, on 1st Jan, 2010 it is Friday.

15. What was the day of the week on 28th May, 2006?

Answer: Sunday

Explanation:

28 May, 2006 = (2005 years + Period from 1.1.2006 to 28.5.2006)

Odd days in 1600 years = 0

Odd days in 400 years = 0

$$5 \text{ years} = (4 \text{ ordinary years} + 1 \text{ leap year}) = (4 \times 1 + 1 \times 2) \quad 6 \text{ odd days}$$

Jan. Feb. March April May

$$(31 + 28 + 31 + 30 + 28) = 148 \text{ days}$$

$$148 \text{ days} = (21 \text{ weeks} + 1 \text{ day}) \quad 1 \text{ odd day.}$$

$$\text{Total number of odd days} = (0 + 0 + 6 + 1) = 7 \quad 0 \text{ odd day.}$$

Given day is Sunday.

CLOCK

1. At what time between 7 and 8 o'clock will the hands of a clock be in the same straight line but, not together?

Answer: 5(5/11)min past 7

Explanation:

When the hands of the clock are in the same straight line but not together, they are 30 minute spaces apart.

At 7 o'clock, they are 25 min. spaces apart.

Minute hand will have to gain only 5 min. spaces.

55 min. spaces are gained in 60 min.

$$5 \text{ min. spaces are gained in } \frac{60}{55} \times 5 \text{ min.} = 5 \frac{5}{11} \text{ min.}$$

5
Required time = 511 min. past 7.

2. At what time between 5.30 and 6 will the hands of a clock be at right angles?

Answer:

$$\text{Required time} = 43\frac{11}{11} \text{ min. past 5.}$$

Explanation:

At 5 o'clock, the hands are 25 min. spaces apart.

To be at right angles and that too between 5.30 and 6, the minute hand has to gain $(25 + 15) = 40$ min. spaces.

55 min. spaces are gained in 60 min.

$$40 \text{ min. spaces are gained in } \frac{60}{55} \times 40 \text{ min.} = 43\frac{7}{11} \text{ min.}$$

7
Required time = 4311 min. past 5.

3. The angle between the minute hand and the hour hand of a clock when the time is 4.20, is:

Answer: 10°

Explanation:

$$\text{Angle traced by hour hand in } \frac{13}{3} \text{ hrs} = \frac{360}{12} \times \frac{13}{3} = 130^\circ.$$

$$\text{Angle traced by min. hand in 20 min.} = \frac{360}{60} \times 20 = 120^\circ.$$

$$\text{Required angle} = (130 - 120)^\circ = 10^\circ.$$

4. At what angle the hands of a clock are inclined at 15 minutes past 5?

Answer:

$$67\frac{1}{2}^\circ$$

Explanation:

$$\text{Angle traced by hour hand in } \frac{21}{4} \text{ hrs} = \frac{360}{12} \times \frac{21}{4} = 157\frac{1}{2}^\circ$$

$$\text{Angle traced by min. hand in 15 min.} = \frac{360}{60} \times 15 = 90^\circ.$$

$$\text{Required angle} = 157\frac{1}{2}^\circ - 90^\circ = 67\frac{1}{2}^\circ$$

5. At 3.40, the hour hand and the minute hand of a clock form an angle of:

Answer: 130°

Explanation:

Angle traced by hour hand in 12 hrs. = 360°.

$$\text{Angle traced by it in } \frac{11}{3} \text{ hrs} = \frac{360}{12} \times \frac{11}{3} = 110^\circ.$$

Angle traced by minute hand in 60 min. = 360°.

$$\text{Angle traced by it in 40 min.} = \frac{360}{60} \times 40 = 240^\circ.$$

$$\text{Required angle} = (240 - 110)^\circ = 130^\circ.$$

6. How many times are the hands of a clock at right angle in a day?

Answer: 44times

Explanation:

In 12 hours, they are at right angles 22 times.

In 24 hours, they are at right angles 44 times.

7. The angle between the minute hand and the hour hand of a clock when the time is 8.30, is:

Answer: 75°

Explanation:

$$\text{Angle traced by hour hand in } \frac{17}{2} \text{ hrs} = \frac{360}{12} \times \frac{17}{2} = 255^\circ.$$

$$\text{Angle traced by min. hand in 30 min.} = \frac{360}{60} \times 30 = 180^\circ.$$

$$\text{Required angle} = (255 - 180)^\circ = 75^\circ.$$

8. How many times in a day, are the hands of a clock in straight line but opposite in direction?

Answer: 22 times

Explanation:

The hands of a clock point in opposite directions (in the same straight line) 11 times in every 12 hours. (Because between 5 and 7 they point in opposite directions at 6 o'clock only).

So, in a day, the hands point in the opposite directions 22 times.

9. At what time between 4 and 5 o'clock will the hands of a watch point in opposite directions?

Answer: $54\frac{6}{11}$ min past 4

Explanation:

At 4 o'clock, the hands of the watch are 20 min. spaces apart.

To be in opposite directions, they must be 30 min. spaces apart.

Minute hand will have to gain 50 min. spaces.

55 min. spaces are gained in 60 min.

$$\begin{array}{l} \text{50 min. spaces are gained in } \frac{60}{55} \times 50 \text{ min. or } 54\frac{6}{11} \text{ min.} \\ \text{Required time} = 54\frac{6}{11} \text{ min. past 4.} \end{array}$$

10. At what time between 9 and 10 o'clock will the hands of a watch be together?

Answer: $49\frac{1}{11}$ min past 9

Explanation:

To be together between 9 and 10 o'clock, the minute hand has to gain 45 min. spaces.

55 min. spaces gained in 60 min.

$$\begin{array}{l} \text{45 min. spaces are gained in } \frac{60}{55} \times 45 \text{ min or } 49\frac{1}{11} \text{ min.} \\ \text{The hands are together at } 49\frac{1}{11} \text{ min. past 9.} \end{array}$$

11. At what time, in minutes, between 3 o'clock and 4 o'clock, both the needles will coincide each other?

Answer: $16\frac{4}{11}$ min past 3

Explanation:

At 3 o'clock, the minute hand is 15 min. spaces apart from the hour hand.

To be coincident, it must gain 15 min. spaces.

55 min. are gained in 60 min.

$$\begin{array}{l} \text{15 min. are gained in } \frac{60}{55} \times 15 \text{ min} = 16\frac{4}{11} \text{ min.} \\ \text{The hands are coincident at } 16\frac{4}{11} \text{ min. past 3.} \end{array}$$

12. How many times do the hands of a clock coincide in a day?

Answer: 22 times

Explanation:

The hands of a clock coincide 11 times in every 12 hours (Since between 11 and 1, they coincide only once, i.e., at 12 o'clock).

AM

12:00

1:05

2:11

3:16

4:22

5:27

6:33

7:38

8:44

9:49

10:55

PM

12:00

1:05

2:11

3:16

4:22

5:27

6:33

7:38

8:44

9:49

10:55

The hands overlap about every 65 minutes, not every 60 minutes.

The hands coincide 22 times in a day.

13. How many times in a day, the hands of a clock are straight?

Answer: 44 times

Explanation:

In 12 hours, the hands coincide or are in opposite direction 22 times.

In 24 hours, the hands coincide or are in opposite direction 44 times a day.

14. A watch which gains uniformly is 2 minutes low at noon on Monday and is 4 min. 48 sec fast at 2 p.m. on the following Monday. When was it correct?

Answer: 2 p.m. on Wednesday.

Explanation:

Time from 12 p.m. on Monday to 2 p.m. on the following Monday = 7 days 2 hours = 170 hours.

$$\text{The watch gains } 2 + \frac{4}{5} \text{ min. or } \frac{34}{5} \text{ min. in 170 hrs.}$$

Now, $\frac{34}{5}$ min. are gained in 170 hrs.

$$2 \text{ min. are gained in } 170 \times \frac{5}{34} \text{ hrs} = 50 \text{ hrs.}$$

Watch is correct 2 days 2 hrs. after 12 p.m. on Monday i.e., it will be correct at 2 p.m. on Wednesday.

15. How much does a watch lose per day, if its hands coincide ever 64 minutes?

Answer: 32(8/11)min

Explanation:

55 min. spaces are covered in 60 min.

$$60 \text{ min. spaces are covered in } 55 \times \frac{60}{55} \text{ min.} = 65 \frac{5}{11} \text{ min.}$$

$$\text{Loss in 64 min.} = 65 \frac{5}{11} - 64 = \frac{16}{11} \text{ min.}$$

$$\text{Loss in 24 hrs} = 16 \frac{1}{64} \times 24 \times 60 \text{ min.} = 32 \frac{8}{11} \text{ min.}$$

16. The reflex angle between the hands of a clock at 10.25 is:

Answer:

$$197 \frac{1}{2}$$

Explanation:

$$\text{Angle traced by hour hand in } \frac{125}{12} \text{ hrs} = 360 \times \frac{125}{12} = 312 \frac{1}{2}^\circ.$$

$$\text{Angle traced by minute hand in 25 min} = 360 \times \frac{25}{60} = 150^\circ.$$

$$\text{Reflex angle} = 360^\circ - 312 \frac{1}{2}^\circ = 360^\circ - 162 \frac{1}{2}^\circ = 197 \frac{1}{2}^\circ.$$

17. An accurate clock shows 8 o'clock in the morning. Through how many degrees will the hour hand rotate when the clock shows 2 o'clock in the afternoon?

Answer: 180°

Explanation:

$$\text{Angle traced by the hour hand in 6 hours} = 360 \times \frac{6}{12} = 180^\circ.$$

18. A watch which gains 5 seconds in 3 minutes was set right at 7 a.m. In the afternoon of the same day, when the watch indicated quarter past 4 o'clock, the true time is:

Answer: 4 p.m

Explanation:

$$\text{Time from 7 a.m. to 4.15 p.m.} = 9 \text{ hrs } 15 \text{ min.} = \frac{37}{4} \text{ hrs.}$$

3 min. 5 sec. of this clock = 3 min. of the correct clock.

$$\frac{37}{720} \text{ hrs of this clock} = \frac{1}{20} \text{ hrs of the correct clock.}$$

$$\frac{37}{4} \text{ hrs of this clock} = \frac{1}{20} \times \frac{720}{37} \times \frac{37}{4} \text{ hrs of the correct clock.}$$

$$= 9 \text{ hrs of the correct clock.}$$

The correct time is 9 hrs after 7 a.m. i.e., 4 p.m.

19. A clock is started at noon. By 10 minutes past 5, the hour hand has turned through:

Answer: 155°

Explanation:

Angle traced by hour hand in 12 hrs = 360°.

$$\text{Angle traced by hour hand in 5 hrs 10 min. i.e., } \frac{31}{6} \text{ hrs} = 360 \times \frac{31}{12 \times 6} = 155^\circ.$$

GEOMETRY

1. What is the complementary angle of half the supplementary angle of 60°?

- A): 90° B): 45° C): 30° D): 60°

Answer: 30°

Explanation:

$$\text{Supplementary angle of } 60^\circ = 180^\circ - 60^\circ = 120^\circ.$$

Half that angle = $120^\circ/2$

= 60° and

$$\text{complementary angle of } 60^\circ = 90^\circ - 60^\circ = 30^\circ. [\text{Answer}]$$

2. Two sides of a triangle are 8 and 24. The third side is x. Which of the following must be true?

- (a) $8 < x < 24$ (b) $16 < x < 32$ (c) $x < 16$ (d) Cannot say (e) None of these

Answer: b

Explanation:

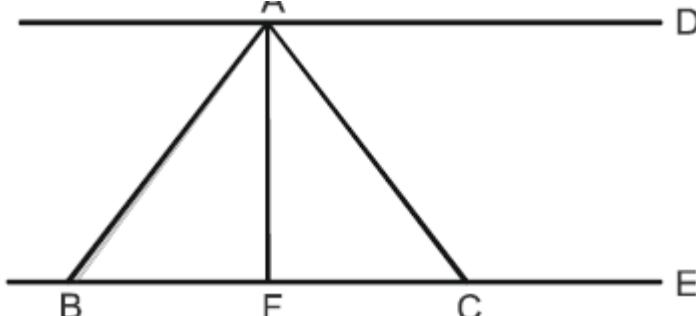
Since the sum of any two sides is greater than the third side,

$$(8 + 24) > x$$

Or $x < 32$ (1) and
 $(x + 8) > 24$ or $x > 16$(2)

(1) and (2) $\Rightarrow 16 < x < 32$. [Answer (b)]

3. In the diagram given alongside, $AD \parallel BE$ and ABC is isosceles with $AB = AC$. If AF is the altitude on BC and $\angle DAC = 30^\circ$, what is the measure of $\angle BAF$?



- A): 90°
- B): 45°
- C): 30°
- D): 60°

Answer: 60°

Explanation:

$AD \dots$

BF and AC is the transversal and so,

$\angle DAC = \angle ACB$ [alternate angles](1)

$\therefore ABC$ is isosceles with $AB = AC \Rightarrow \angle ACB = \angle ABC$ (2)

$\angle DAC = 30^\circ$ (given)(3)

(1), (2) and (3) $\Rightarrow \angle ABC = \angle ACB = \angle DAC = 30^\circ$ (4)

AF is the altitude on $BC \Rightarrow \angle AFB = 90^\circ$ (5)

In $\triangle ABF$, $\angle ABF + \angle AFB + \angle BAF = 180^\circ$ (6)

(4), (5) and (6) $\Rightarrow \angle BAF = 180^\circ - (30^\circ + 90^\circ) = 60^\circ$. [Answer]

4. When the midpoints of the four sides of any quadrilateral are joined together the figure obtained MUST be a

- (a) rectangle (b) square (c) parallelogram (d) trapezium (e) Cannot say

Answer:c

Explanation:

In ABD , E and H are midpoints of the sides AB and BD and so by midpoint theorem, $EH \parallel AD$ (1) and
 $EH = \frac{1}{2}AD$ (2)
 Similarly, $FG \parallel AD$ (3) and
 $FG = \frac{1}{2}AD$ (4)

(1) and (3) $\Rightarrow EH \parallel FG$ (5)

(2) and (4) $\Rightarrow EH = FG$ (6)

(5) and (6) $\Rightarrow EHFG$ is a parallelogram. [Answer (c)]

5. In a polygon one interior angle is 162° and each of the other interior angles is 142° . How many sides does the polygon have?

- A): 8
- B): 10
- C): 12
- D): 14

Answer: 10

Explanation:

Let the number of sides be n . Then, the total of all interior angles
 $= (n - 2) \times 180^\circ$ (1)

From the given conditions, the total of all interior angles
 $= 162^\circ + (n - 1) \times 142^\circ$ (2)

(1) and (2) $\Rightarrow (n - 2) \times 180^\circ = 162^\circ + (n - 1) \times 142^\circ$ or

$$38n = 380$$

$$n = 10. \text{ [Answer]}$$

6. A chord of length 64 is at a distance of 24 from the centre of a circle. What is the radius of the circle?

- a) 38
- b) 40
- c) 42
- d) 44

Answer: 40

Explanation:

Applying the result $r^2 = (l/2)^2 + d^2$,

$$r^2 = 32^2 + 24^2$$

$$r = 40. \text{ [Answer]}$$

7. AB is a chord of a circle O and C is any point on the circumference of the circle. If $\angle ACB = 60^\circ$, what is the measure of $\angle OAB$?

- A): 30°
 - B): 60°
 - C): 90°
 - D): 45°

Answer: 30°

Explanation:

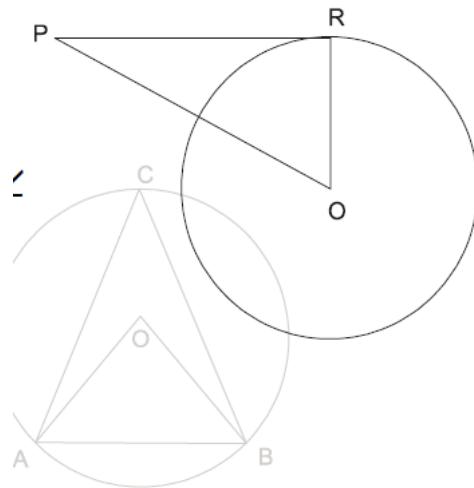
Since angle at the centre is double the angle at the circumference and $\angle ACB = 60^\circ$, $\angle AOB = 120^\circ$.

Now, $\triangle AOB$ is isosceles since $AO = BO$, both being radii. So, $\angle OAB = \angle OBA$.

$$\text{But, } \angle OAB + \angle OBA + \angle AOB = 180^\circ.$$

$$\text{So, } \angle OAB = \frac{1}{2}(180^\circ - 120^\circ) = 30^\circ. \text{ [Answer]}$$

8. A tangent from a point P touches a circle of radius 5 at point R. If O is the centre of the circle and OP is 13, what is the length of PR?



- A):10
 - B):12
 - C):14
 - D):16

Answer:12

Explanation:

..OPR is right.

Hence, OP2 = PR2 + OR2 or

$$\text{PR2} \dots = 132 - 52$$

PRO = 90° and hence

Since PR is tangent and OR is

...
radius.

$$= 144 \text{ or}$$

PR = 12. [Answer]

9. In a rhombus, the lengths of the diagonals are 40 metres and 30 metres respectively. Find its area and perimeter.

- (a) 600 and 100 (b) 1200 and 400 (c) 400 and 100 (d) 300 and 70

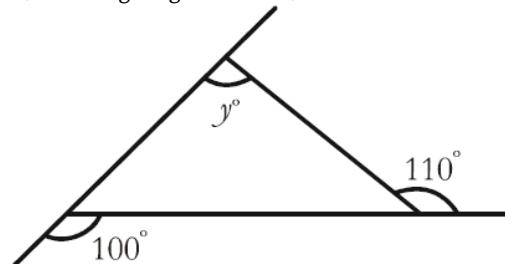
10. The area of a circle equals the area of a triangle of equal sides and also the area of a square. If the perimeters of the circle, the triangle and the square are c , t and s respectively then

- (a) $s > t > c$ (b) $c > t > s$ (c) $c > s > t$ (d) $t > s > c$

11. Two circles both of radius 8 touch externally. If P is a point on one circle and Q is a point on the other circle, then what is the maximum possible length for the line segment PQ?

- (a) 7 (b) 14 (c) 32 (d) 28

12. In the figure given below, what is the value of y ?



- (a) 40 (b) 50 (c) 30 (d) 70

Answer:c

13. In a certain parallelogram the degree measure of one angle lower than that of another angle by 60.

What is the degree measure of the smaller angle?

- (a) 30 (b) 75 (c) 60 (d) 70

Answer:c

14. In $\triangle ABC$, A is 2 units to the left of y-axis and 1 unit above x-axis, B is 2 units to the right of y-axis and 2 units below x-axis and C is 5 units to the right of y-axis and 2 unit above x-axis. Then, $\triangle ABC$ is

- (a) isosceles (b) equilateral (c) right angled (d) right angled isosceles

Answer:c

15. A circle has area which is 100 times the area of another circle. What is the ratio of their circumference?

- (a) 1 : 10 (b) 10 : 1 (c) 1 : 5 (d) 5 : 1

Answer:b

16. If the height of a cone is increased by 21%, find the percentage decrease in its radius to make the volume constant.

- (a) 90.9% (b) 9.09% (c) 8.09% (d) 11.2%

Answer:b

Explanation:

Volume of the cone = $(1/3)\pi r^2 h$. If r_1 and h_1 are the changed radius and height respectively,

$$\text{constant volume} \Rightarrow (1/3)\pi r_1^2 h_1 = (1/3)\pi r^2 h$$

$$2h_1$$

$$\text{Given } h_1 = 1.21h, (1/3)\pi r_1^2 h_1$$

$$= (1/3)\pi r_1^2$$

$$2(1.21h)$$

$$1.21r_1$$

$$2 = r_1$$

$$2 = r_1/1.21$$

$$r_1 = r_1/1.1$$

$$= 0.9091$$

$$\Rightarrow \text{percentage reduction in radius} = 100 \times (1 - 0.9091)$$

$$= 9.09\%$$

17. Two chords of a circle when produced beyond the circle intersect at E. If $\angle E = 30^\circ$ and $\angle A = 25^\circ$, Find $\angle CBA$.

- (a) 45° (b) 55° (c) 65° (d) 70°

Answer:b

Explanation:

$$\text{In } \angle ADE, \angle ADE = 180^\circ - 25^\circ - 30^\circ = 125^\circ$$

$$\angle ADE = 125^\circ \Rightarrow$$

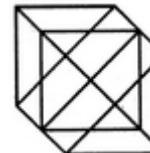
$$\angle ADC = 180^\circ - 125^\circ = 55^\circ \text{ [adjacent angle]}$$

$$\angle ADC = 55^\circ \Rightarrow$$

$$\angle CBA = 55^\circ \text{ [angles in the same segment].}$$

REASONING APTITUDE ANALYTICAL REASONING

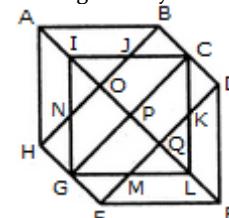
1. Find the number of triangles in the given figure.



Answer: 24

Explanation:

The figure may be labelled as shown.



The simplest triangles are IJO, BCJ, CDK, KQL, MLQ, GFM, GHN and NIO i.e. 8 in number.

The triangles composed of two components each are ABO, AHO, NIJ, IGP, ICP, DEQ, FEQ, KLM, LCP and LGP i.e. 10 in number.

The triangles composed of four components each are HAB, DEF, LGI, GIC, ICL and GLG i.e. 6 in number.

$$\text{Total number of triangles in the figure} = 8 + 10 + 6 = 24.$$

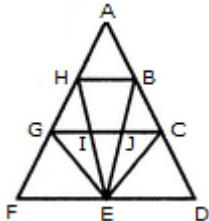
2. Find the number of triangles in the given figure.



Answer: 18

Explanation:

The figure may be labelled as shown.



The simplest triangles are AHB, GHI, BJC, GFE, GIE, IJE, CEJ and CDE i.e. 8 in number.

The triangles composed of two components each are HEG, BEC, HBE, JGE and ICE i.e. 5 in number.

The triangles composed of three components each are FHE, GCE and BED i.e. 3 in number.

There is only one triangle i.e. AGC composed of four components.

There is only one triangle i.e. AFD composed of nine components.

Thus, there are $8 + 5 + 3 + 1 + 1 = 18$ triangles in the given figure.

3. Find the number of triangles in the given figure.



Answer: 28

Explanation:

The figure may be labelled as shown.



The simplest triangles are AGH, GFO, LFO, DJK, EKP, PEL and IMN i.e. 7 in number.

The triangles having two components each are GFL, KEL, AMO, NDP, BHN, CMJ, NEJ and HFM i.e. 8 in number.

The triangles having three components each are IOE, IFP, BIF and CEI i.e. 4 in number.

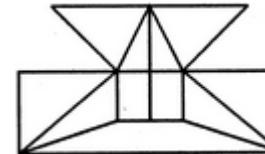
The triangles having four components each are ANE and DMF i.e. 2 in number.

The triangles having five components each are FCK, BGE and ADL i.e. 3 in number.

The triangles having six components each are BPF, COE, DHF and AJE i.e. 4 in number.

Total number of triangles in the figure = $7 + 8 + 4 + 2 + 3 + 4 = 28$.

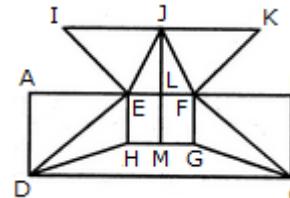
4. Find the minimum number of straight lines required to make the given figure.



Answer: 17

Explanation:

The figure may be labelled as shown.



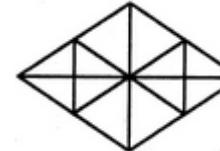
The horizontal lines are IK, AB, HG and DC i.e. 4 in number.

The vertical lines are AD, EH, JM, FG and BC i.e. 5 in number.

The slanting lines are IE, JE, JF, KF, DE, DH, FC and GC i.e. 8 is number.

Thus, there are $4 + 5 + 8 = 17$ straight lines in the figure.

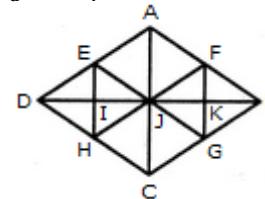
5. Find the number of triangles in the given figure.



Answer: 28

Explanation:

The figure may be labelled as shown.



The simplest triangles are AFJ, FJK, FKB, BKG, JKG, JGC, HJC, HIJ, DIH, DEI, EIJ and AEJ i.e. 12 in number.

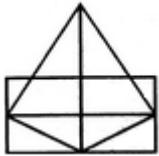
The triangles composed of two components each are JFB, FBG, BJJ, JFG, DEJ, EJH, DJH and DEH i.e. 8 in number.

The triangles composed of three components each are AJB, JBC, DJC and ADJ i.e. 4 in number.

The triangles composed of six components each are DAB, ABC, BCD and ADC i.e. 4 in number.

Thus, there are $12 + 8 + 4 + 4 = 28$ triangles in the figure.

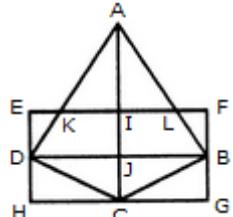
6. Find the number of triangles in the given figure.



Answer: 15

Explanation:

The figure may be labelled as shown.



The simplest triangles are AKI, AIL, EKD, LFB, DJC, BJC, DHC and BCG i.e. 8 in number.

The triangles composed of two components each are AKL, ADJ, AJB and DBC i.e. 4 in number.

The triangles composed of the three components each are ADC and ABC i.e. 2 in number.

There is only one triangle i.e. ADB composed of four components.

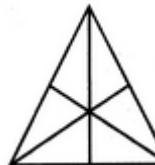
Thus, there are $8 + 4 + 2 + 1 = 15$ triangles in the figure.

The triangles composed of two components each are ABE, AGE, BHF, BCH, CGH and BIE i.e. 6 in number.

The triangles composed of three components each are ABH, BCE and CDE i.e. 3 in number.

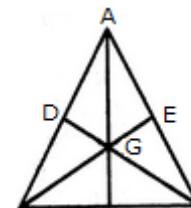
Hence, the total number of triangles in the figure = $6 + 6 + 3 = 15$.

8. Find the number of triangles in the given figure.



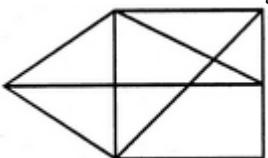
Answer: 16

Explanation:



The figure may be labelled as shown.

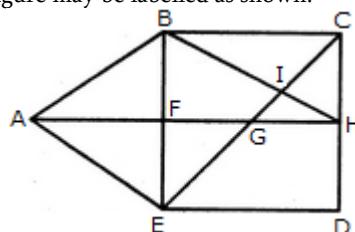
7. Find the number of triangles in the given figure.



Answer: 15

Explanation:

The figure may be labelled as shown.



The simplest triangles are ABF, BIC, CIH, GIH, FGE and AFE i.e. 6 in number.

The simplest triangles are AGE, EGC, GFC, BGF, DGB and ADG i.e. 6 in number.

The triangles composed of two components each are AGO, BGC and ABG i.e. 3 in number.

The triangles composed of three components each are AFC, BEC, BDC, ABF, ABE and DAC i.e. 6 in number.

There is only one triangle i.e. ABC composed of six components.

Thus, there are $6 + 3 + 6 + 1 = 16$ triangles in the given figure.

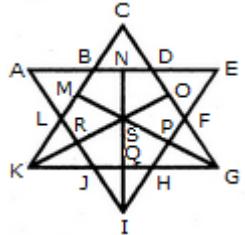
9. Find the number of triangles in the given figure.



Answer: 27

Explanation:

The figure may be labelled as shown.



The simplest triangles are ABL, BCD, DEF, FGP, PGH, QHI, JQI, KJL and LRK i.e. 9 in number.

The triangles composed of two components each are OSG, SGQ, SPI, SRI, KSQ, KMS, FGH, JHI and JKL i.e. 9 in number.

There is only one triangle i.e. KSG which is composed of four components.

The triangles composed of five components each are NEI, ANI, MCG and KCO i.e. 4 in number.

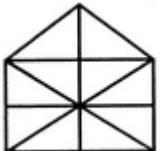
The triangles composed of six components each are GMK and KOG i.e. 2 in number.

There is only one triangle i.e. AEI composed of ten components.

There is only one triangle i.e. KCG composed of eleven components.

Therefore, Total number of triangles in the given figure = $9 + 9 + 1 + 4 + 2 + 1 + 1 = 27$.

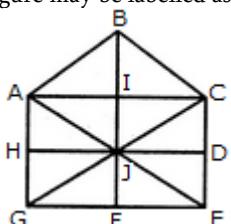
10. Find the number of triangles in the given figure.



Answer: 21

Explanation:

The figure may be labelled as shown.



The simplest triangles are ABI, BIC, AIJ, GIJ, AHJ, CDJ, JHG, JDE, GJF and EJF i.e. 10 in number.

The triangles composed of two components each are ABC, BCJ, ACJ, BAJ, AJG, CJE and GJE i.e. 7 in number.

The triangles composed of four components each are ACG, ACE, CGE and AGE i.e. 4 in number.

Total number of triangles in the figure = $10 + 7 + 4 = 21$.

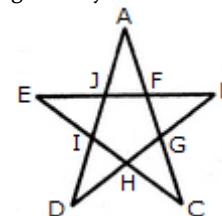
11. Find the number of triangles in the given figure.



Answer: 10

Explanation:

The figure may be labelled as shown.

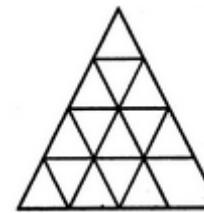


The simplest triangles are AJF, FBG, GCH, HDI and IEJ i.e. 5 in number.

The triangles composed of three components each are EBH, AIC, EFC, ADG and BJD i.e. 5 in number.

Thus, there are $5 + 5 = 10$ triangles in the figure.

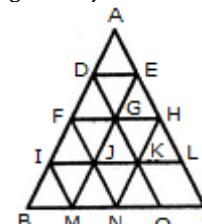
12. Find the minimum number of straight lines required to make the given figure.



Answer: 11

Explanation:

The figure may be labelled as shown.

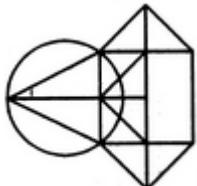


The horizontal lines are DE, FH, IL and BC i.e. 4 in number.

The slanting lines are AC, DO, FN, IM, AB, EM and HN i.e. 7 in number.

Thus, there are $4 + 7 = 11$ straight lines in the figure.

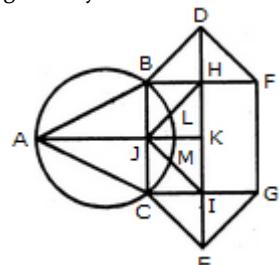
13. Find the number of triangles in the given figure.



Answer: 14

Explanation:

The figure may be labelled as shown.



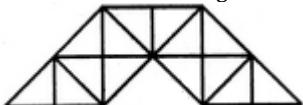
The simplest triangles are ABJ, ACJ, BDH, DHF, CIE and GIE i.e. 6 in number.

The triangles composed of two components each are ABC, BDF, CEG, BHJ, JHK, JKI and CJI i.e. 7 in number.

There is only one triangle JHI which is composed of four components.

Thus, there are $6 + 7 + 1 = 14$ triangles in the given figure.

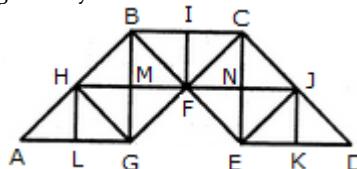
14. Find the number of triangles in the given figure.



Answer: 29

Explanation:

The figure may be labelled as shown.

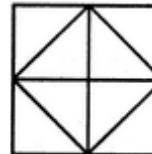


The simplest triangles are AHL, LHG, GHM, HMB, GMF, BMF, BIF, CIF, FNC, CNJ, FNE, NEJ, EKJ and JKD i.e. 14 in number.

The triangles composed of two components each are AGH, BHG, HBF, BFG, HFG, BCF, CJF, CJE, JEF, CFE and JED i.e. 11 in number.

The triangles composed of four components each are ABG, CBG, BCE and CED i.e. 4 in number.
Total number of triangles in the given figure = $14 + 11 + 4 = 29$.

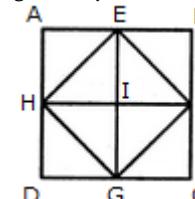
15. Find the number of triangles in the given figure.



Answer: 12

Explanation:

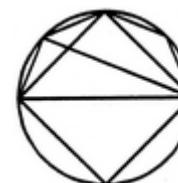
The figure may be labelled as shown.



The simplest triangles are AEH, EHI, EBF, EFI, FGC, IFG, DGH and HIG i.e. 8 in number.

The triangles composed of two components each are HEF, EFG, HFG and EFG i.e. 4 in number.
Thus, there are $8 + 4 = 12$ triangles in the figure.

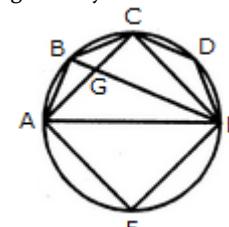
- 16.. Find the number of triangles in the given figure.



Answer: 10

Explanation:

The figure may be labelled as shown.

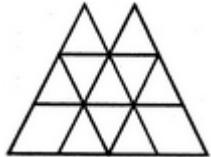


The simplest triangles are ABG, BCG, CGE, CDE, AGE and AEF i.e. 6 in number.

The triangles composed of two components each are ABE, ABC, BCE and ACE i.e. 4 in number.

There are $6 + 4 = 10$ triangles in the figure.

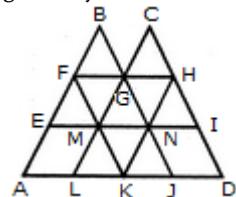
17. Find the number of triangles in the given figure.



Answer: 18

Explanation:

The figure may be labelled as shown.



The simplest triangles are BFG, CGH, EFM, FMG, GMN, GHN, HNI, LMK, MNK and KNJ i.e. 10 in number.

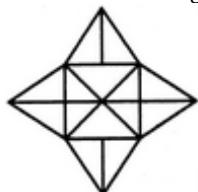
The triangles composed of three components each are FAK and HKD i.e. 2 in number.

The triangles composed of four components each are BEN, CMI, GLJ and FHK i.e. 4 in number.

The triangles composed of eight components each are BAJ and OLD i.e. 2 in number.

Thus, there are $10 + 2 + 4 + 2 = 18$ triangles in the given figure.

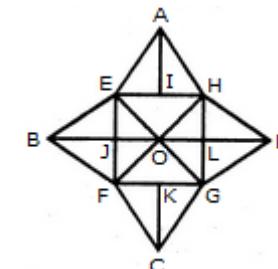
18. Find the number of triangles in the given figure.



Answer: 28

Explanation:

The figure may be labelled as shown.



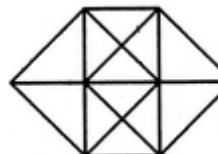
The simplest triangles are AEI, AIH, BEJ, BJF, CFK, CKG, DGL, DLH, EOJ, FOJ, FOG, LOG, HOL and HOE i.e. 14 in number.

The triangles composed of two components each are EAH, FBE, BEO, EOF, BFO, FCG, GDH, HOD, HOG and GOD i.e. 10 in number.

The triangles composed of three components each are EFH, EHG, FGH and EFG i.e. 4 in number.

Thus, there are $14 + 10 + 4 = 28$ triangles in the given figure.

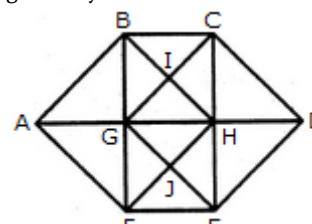
19. Find the number of triangles in the given figure.



Answer: 28

Explanation:

The figure may be labelled as shown.



The simplest triangles are ABG, BIG, BIC, CIH, GIH, CDH, HED, GHJ, HJE, FEJ, GFJ and AGF i.e. 12 in number.

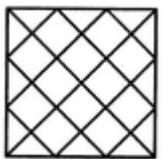
The triangles composed of two components each are ABF, CDE, GBC, BCH, GHG, BHG, GHF, GHE, HEF and GEF i.e. 10 in number.

The triangles composed of three components each are ABH, AFH, CDG and GDE i.e. 4 in number.

The triangles composed of four components each are BHF and CGE i.e. 2 in number.

Total number of triangles in the figure = $12 + 10 + 4 + 2 = 28$.

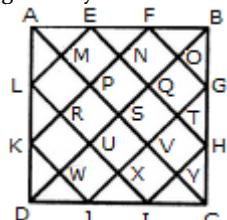
20. Find the number of triangles in the given figure.



Answer: 36

Explanation:

The figure may be labelled as shown.



The simplest triangles are AML, LRK, KWD, DWJ, JXI, IYC, CYH, HTG, GOB, BOF, FNE and EMA i.e. 12 in number.

The triangles composed of two components each are AEL, KDJ, HIC and FBG i.e. 4 in number.

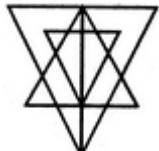
The triangles composed of three components each are APF, EQB, BQH, GVC, CVJ, IUD, DUL and KPA i.e. 8 in number.

The triangles composed of six components each are ASB, BSG, CSD, DSA, AKF, EBH, GGJ and IDL i.e. 8 in number.

The triangles composed of twelve components each are ADB, ABC, BCD and CDA i.e. 4 in number.

Total number of triangles in the figure = $12 + 4 + 8 + 8 + 4 = 36$.

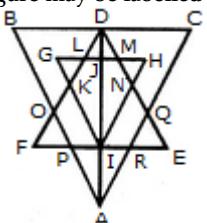
21. Find the number of triangles in the given figure.



Answer: 27

Explanation:

The figure may be labelled as shown.



The simplest triangles are GLK, DLJ, DJM, HMN, QRE, IRA, IPA and FPO i.e. 8 in number. The triangles having two components each are BDO, CDQ, DLM, PRA, KFI, NEI, HJI, GJI, DKI and DNI i.e. 10 in number.

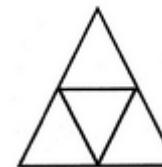
The triangles having four components each are DIE, DFI, DOA, DQA and GHI i.e. 5 in number. The triangles having six components each are DCA and DBA i.e. 2 in number.

DEF is the only triangle having eight components.

ABC is the only triangle having twelve components.

Thus, there are $8+10+5+2+1+1 = 27$ triangles in the figure.

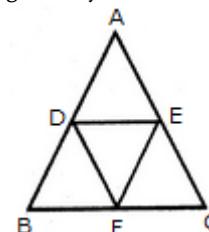
22. Find the number of triangles in the given figure.



Answer: 5

Explanation:

The figure may be labelled as shown.

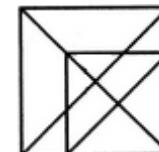


The simplest triangles are ADE, BDF, DEF and EFC i.e. 4 in number.

There is only one triangle ABC composed of four components.

Thus, there are $4+1 = 5$ triangles in the given figure.

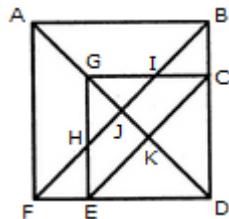
23. Find the number of triangles in the given figure.



Answer: 21

Explanation:

The figure may be labelled as shown.



The simplest triangles are EFH, BIC, GHJ, GIJ, EKD and CKD i.e. 6 in number.

The triangles composed of two components each are ABJ, AFJ, GCK, GEK, CED and GHI i.e. 6 in number.

The triangles composed of three components each are GCD, GED, DJB and DJF i.e. 4 in number.

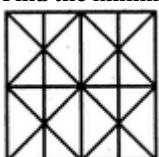
The triangles composed of four components each are ABF and GCE i.e. 2 in number.

The triangles composed of five components each are ABD and AFD i.e. 2 in number.

There is only one triangle i.e. FBD composed of six components.

Total number of triangles in the figure = $6 + 6 + 4 + 2 + 2 + 1 = 21$.

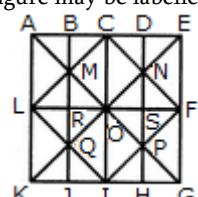
Find the minimum number of straight lines required to make the given figure.



Answer: 14

Explanation:

The figure may be labelled as shown.



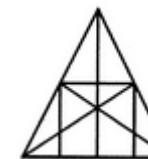
The horizontal lines are AK, BJ, CI, DH and EG i.e. 5 in number.

The vertical lines are AE, LF and KG i.e. 3 in number.

The slanting lines are LC, CF, FI, LI, EK and AG i.e. 6 in number.

Thus, there are $5 + 3 + 6 = 14$ straight lines in the figure.

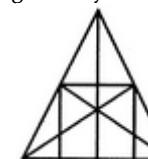
25. What is the number of straight lines and the number of triangles in the given figure.



Answer: 9 straight lines and 36 triangles

Explanation:

The figure may be labelled as shown.



The Horizontal lines are DF and BC i.e. 2 in number.

The Vertical lines are DG, AH and FI i.e. 3 in number.

The Slanting lines are AB, AC, BF and DC i.e. 4 in number.

Thus, there are $2 + 3 + 4 = 9$ straight lines in the figure.

Now, we shall count the number of triangles in the figure.

The simplest triangles are ADE, AEF, DEK, EFK, DJK, FLK, DJB, FLC, BJJ and LIC i.e. 10 in number.

The triangles composed of two components each are ADF, AFK, DFK, ADK, DKB, FCK, BKH, KHC, DGB and FIC i.e. 10 in number.

The triangles composed of three components each are DFJ and DFL i.e. 2 in number.

The triangles composed of four components each are ABK, ACK, BFI, CDG, DFB, DFC and BKC i.e. 7 in number.

The triangles composed of six components each are ABH, ACH, ABF, ACD, BFC and CDB i.e. 6 in number.

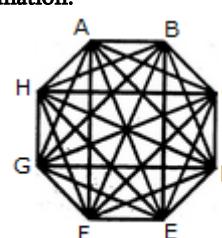
There is only one triangle i.e. ABC composed of twelve components.

There are $10 + 10 + 2 + 7 + 6 + 1 = 36$ triangles in the figure.

26. What is the number of triangles that can be formed whose vertices are the vertices of an octagon but have only one side common with that of octagon?

Answer: 32

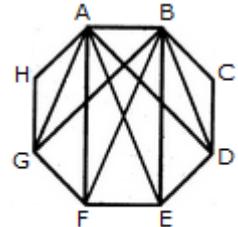
Explanation:



(Fig.1)

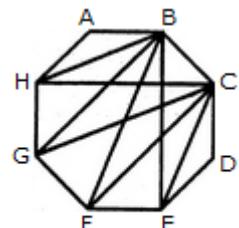
When the triangles are drawn in an octagon with vertices same as those of the octagon and

having one side common to that of the octagon, the figure will appear as shown in (Fig. 1).



(Fig. 2)

Now, we shall first consider the triangles having only one side AB common with octagon ABCDEFGH and having vertices common with the octagon (See Fig. 2). Such triangles are ABD, ABE, ABF and ABG i.e. 4 in number.



(Fig. 3)

Similarly, the triangles having only one side BC common with the octagon and also having vertices common with the octagon are BCE, BCF, BCG and BCH (as shown in Fig. 3). i.e. There are 4 such triangles.

This way, we have 4 triangles for each side of the octagon. Thus, there are $8 \times 4 = 32$ such triangles.

PIPES AND CISTERNS

1. How long will it take to empty the tank if both the inlet pipe A and the outlet pipe B are opened simultaneously?

- I. A can fill the tank in 16 minutes.
- II. B can empty the full tank in 8 minutes.
- A. I alone sufficient while II alone not sufficient to answer
- B. II alone sufficient while I alone not sufficient to answer
- C. Either I or II alone sufficient to answer
- D. Both I and II are not sufficient to answer
- E. Both I and II are necessary to answer

Answer & Explanation

Answer: Option E

Explanation:

$$\text{I. A's 1 minute's filling work} = \frac{1}{16}$$

$$\text{II. B's 1 minute's filling work} = \frac{1}{8}$$

$$(\text{A} + \text{B})\text{'s 1 minute's emptying work} = \frac{1}{8} - \frac{1}{16} = \frac{1}{16}$$

Tank will be emptied in 16 minutes.

Thus, both I and II are necessary to answer the question.

Correct answer is (E).

2. If both the pipes are opened, how many hours will be taken to fill the tank?

- I. The capacity of the tank is 400 litres.
- II. The pipe A fills the tank in 4 hours.
- III. The pipe B fills the tank in 6 hours.

A. Only I and II

B. Only II and III

C. All I, II and III

D. Any two of the three

E. Even with all the three statements, answer cannot be given.

Answer & Explanation

Answer: Option B

Explanation:

$$\text{II. Part of the tank filled by A in 1 hour} = \frac{1}{4}$$

$$\text{III. Part of the tank filled by B in 1 hour} = \frac{1}{6}$$

$$(\text{A} + \text{B})\text{'s 1 hour's work} = \frac{1}{4} + \frac{1}{6} = \frac{5}{12}$$

$$\frac{12}{5} \text{ hrs} = 2 \text{ hrs } 24 \text{ min.}$$

So, II and III are needed.

Correct answer is (B).

3. How much time will the leak take to empty the full cistern?

- I. The cistern is normally filled in 9 hours.
- II. It takes one hour more than the usual time to fill the cistern because of a leak in the bottom.
- A. I alone sufficient while II alone not sufficient to answer
- B. II alone sufficient while I alone not sufficient to answer
- C. Either I or II alone sufficient to answer
- D. Both I and II are not sufficient to answer
- E. Both I and II are necessary to answer

Answer & Explanation

Answer: Option E

Explanation:

I. Time taken to fill the cistern without leak = 9 hours.

Part of cistern filled without leak in 1 hour = $\frac{1}{9}$

II. Time taken to fill the cistern in presence of leak = 10 hours.

Net filling in 1 hour = $\frac{1}{10}$

Work done by leak in 1 hour = $\frac{1}{9} - \frac{1}{10} = \frac{1}{90}$

Leak will empty the full cistern in 90 hours.

Clearly, both I and II are necessary to answer the question.

Correct answer is (E).

LOGICAL PROBLEMS

1. The Kingston Mall has more stores than the Galleria.

The Four Corners Mall has fewer stores than the Galleria.

The Kingston Mall has more stores than the Four Corners Mall.

If the first two statements are true, the third statement is

A.true

B.false

C.uncertain

Answer & Explanation

Answer: Option A

Explanation:

From the first two statements, you know that the Kingston Mall has the most stores, so the

Kingston Mall would have more stores than the Four Corners Mall.

2. All the tulips in Zoe's garden are white.

All the pansies in Zoe's garden are yellow.

All the flowers in Zoe's garden are either white or yellow

If the first two statements are true, the third statement is

A.true

B.false

C.uncertain

Answer & Explanation

Answer: Option C

Explanation:

The first two statements give information about Zoe's tulips and pansies. Information about any other kinds of flowers cannot be determined.

3. During the past year, Josh saw more movies than Stephen.

Stephen saw fewer movies than Darren.

Darren saw more movies than Josh.

If the first two statements are true, the third statement is

A.true

B.false

C.uncertain

Answer & Explanation

Answer: Option C

Explanation:

Because the first two sentences are true, both Josh and Darren saw more movies than Stephen.

However, it is uncertain as to whether Darren saw more movies than Josh.

4. Rover weighs less than Fido.

Rover weighs more than Boomer.

Of the three dogs, Boomer weighs the least.

If the first two statements are true, the third statement is

A.true

B.false

C.uncertain

Answer & Explanation

Answer: Option A

Explanation:

According to the first two statements, Fido weighs the most and Boomer weighs the least.

5. All the offices on the 9th floor have wall-to-wall carpeting.

No wall-to-wall carpeting is pink.

None of the offices on the 9th floor has pink wall-to-wall carpeting.

If the first two statements are true, the third statement is

A.true

B.false

C.uncertain

Answer & Explanation

Answer: Option A

Explanation:

If no wall-to-wall carpeting is pink and all the offices have wall-to-wall carpeting, none of the offices has pink wall-to-wall carpeting.

6. Class A has a higher enrollment than Class B.

Class C has a lower enrollment than Class B.

Class A has a lower enrollment than Class C.

If the first two statements are true, the third statement is

A.true

B.false

C.uncertain

Answer & Explanation

Answer: Option B

Explanation:

From the first two statements, we know that of the three classes, Class A has the highest enrollment, so the third statement must be false.

7.A fruit basket contains more apples than lemons.

There are more lemons in the basket than there are oranges.

The basket contains more apples than oranges.

If the first two statements are true, the third statement is

A.true

B.false

C.uncertain

Answer & Explanation

Answer: Option A

Explanation:

There are fewer oranges than either apples or lemons, so the statement is true.

Easy method: (Try this method to solve without any confusion)

1. A fruit basket contains more apples than lemons = App > Lem

2. There are more lemons in the basket than there are oranges = Lem > Org

Now, Combine the above two results: App > Lem > Org

3. The basket contains more apples than oranges (App > ... > Org) = Yes.

Therefore, the given 3rd statement is true.

8. The Shop and Save Grocery is south of Greenwood Pharmacy.

Rebecca's house is northeast of Greenwood Pharmacy.

Rebecca's house is west of the Shop and Save Grocery.

If the first two statements are true, the third statement is

A.true

B.false

C.uncertain

Answer & Explanation

Answer: Option B

Explanation:

Because the first two statements are true, Rebecca's house is also northeast of the Shop and Save Grocery, which means that the third statement is false.

9. Joe is younger than Kathy.

Mark was born after Joe.

Kathy is older than Mark.

If the first two statements are true, the third statement is

A.true

B.false

C.uncertain

Answer & Explanation

Answer: Option A

Explanation:

Joe is younger than Kathy and older than Mark, so Mark must be younger than Kathy.

10. On the day the Barton triplets are born,

Jenna weighs more than Jason.

Jason weighs less than Jasmine.

Of the three babies, Jasmine weighs the most.

If the first two statements are true, the third statement is

A.true

B.false

C.uncertain

Answer & Explanation

Answer: Option C

Explanation:

We only know that Jasmine weighs more than Jason. There is no way to tell whether Jasmine also weighs more than Jenna.

11. The temperature on Monday was lower than on Tuesday.

The temperature on Wednesday was lower than on Tuesday.

The temperature on Monday was higher than on Wednesday

If the first two statements are true, the third statement is

A.true

B.false

C.uncertain

Answer & Explanation

Answer: Option C

Explanation:

We know from the first two statements that Tuesday had the highest temperature, but we cannot know whether Monday's temperature was higher than Tuesday's

12. Oat cereal has more fiber than corn cereal but less fiber than bran cereal.

Corn cereal has more fiber than rice cereal but less fiber than wheat cereal.

Of the three kinds of cereal, rice cereal has the least amount of fiber.

If the first two statements are true, the third statement is

A.true

B.false

C.uncertain

Answer & Explanation

Answer: Option A

Explanation:

From the first statement, we know that bran cereal has more fiber than both oat cereal and corn cereal. From the second statement, we know that rice cereal has less fiber than both corn and wheat cereals. Therefore, rice cereal has the least amount of fiber.

13. Martina is sitting in the desk behind Jerome.

Jerome is sitting in the desk behind Bryant.

Bryant is sitting in the desk behind Martina.

If the first two statements are true, the third statement is

A.true

B.false

C.uncertain

Answer & Explanation

Answer: Option B

Explanation:

Given the information in the first two statements, Bryant is sitting in front of both Jerome and Martina, so the third statement must be false.

14. Battery X lasts longer than Battery Y.

Battery Y doesn't last as long as Battery Z.

Battery Z lasts longer than Battery X.

If the first two statements are true, the third statement is

A.true

B.false

C.uncertain

Answer & Explanation

Answer: Option C

Explanation:

The first two statements indicate that Battery Y lasts the least amount of time, but it cannot be determined if Battery Z lasts longer than Battery X.

15. Middletown is north of Centerville.

Centerville is east of Penfield.

Penfield is northwest of Middletown.

If the first two statements are true, the third statement is

A.true

B.false

C.uncertain

Answer & Explanation

Answer: Option B

Explanation:

Because the first two statements are true, Penfield is west of Centerville and southwest of Middletown. Therefore, the third statement is false.

16. All spotted Gangles have long tails.

Short-haired Gangles always have short tails.

Long-tailed Gangles never have short hair.

If the first two statements are true, the third statement is

A.true

B.false

C.uncertain

Answer & Explanation

Answer: Option C

Explanation:

We know only that long-tailed Gangles have spots. We cannot know for certain if long-tailed Gangles also have short hair.

17. All Lamels are Signots with buttons.

No yellow Signots have buttons.

No Lamels are yellow.

If the first two statements are true, the third statement is

A.true

B.false

C.uncertain

Answer & Explanation

Answer: Option A

Explanation:

We know that there are Signots with buttons, or Lamels, and that there are yellow Signots, which have no buttons. Therefore, Lamels do not have buttons and cannot be yellow.

18. The hotel is two blocks east of the drugstore.

The market is one block west of the hotel.

The drugstore is west of the market.

If the first two statements are true, the third statement is

- A.true
- B.false
- C.uncertain

Answer: Option A

Explanation:

The market is one block west of the hotel. The drugstore is two blocks west of the hotel, so the drugstore is west of the market.

19. A toothpick is useful.

Useful things are valuable.

A toothpick is valuable.

If the first two statements are true, the third statement is

- A.true
- B.false
- C.uncertain

Answer & Explanation

Answer: Option A

Explanation:

To the extent that a toothpick is useful, it has value.

20. Tom puts on his socks before he puts on his shoes.

He puts on his shirt before he puts on his jacket.

Tom puts on his shoes before he puts on his shirt.

If the first two statements are true, the third statement is

- A.true
- B.false
- C.uncertain

Answer & Explanation

Answer: Option C

Explanation:

There is not enough information to verify the third statement.

21. Three pencils cost the same as two erasers.

Four erasers cost the same as one ruler.

Pencils are more expensive than rulers.

If the first two statements are true, the third statement is

- A.true
- B.false
- C.uncertain

Answer & Explanation

Answer: Option B

Explanation:

Rulers are the most expensive item.

22.Taking the train across town is quicker than taking the bus.

Taking the bus across town is slower than driving a car.

Taking the train across town is quicker than driving a car.

If the first two statements are true, the third statement is

- A.true
- B.false
- C.uncertain

Answer & Explanation

Answer: Option C

Explanation:

Both the car and the train are quicker than the bus, but there is no way to make a comparison between the train and the car.

23.Cloudy days tend to be more windy than sunny days.

Foggy days tend to be less windy than cloudy days.

Sunny days tend to be less windy than foggy days.

If the first two statements are true, the third statement is

- A.true
- B.false
- C.uncertain

Answer & Explanation

Answer: Option C

Explanation:

Cloudy days are the most windy, but there is not enough information to compare the wind on the foggy days with the wind on the sunny days.

24. At a parking lot, a sedan is parked to the right of a pickup and to the left of a sport utility vehicle.

A minivan is parked to the left of the pickup.

The minivan is parked between the pickup and the sedan.

If the first two statements are true, the third statement is

- A.true
- B.false
- C.uncertain

Answer & Explanation

Answer: Option B

Explanation:

This is the order of the cars from left to right: minivan, pickup, sedan, sport utility vehicle.

25. The bookstore has a better selection of postcards than the newsstand does.

The selection of postcards at the drugstore is better than at the bookstore.

The drugstore has a better selection of postcards than the bookstore or the newsstand.

If the first two statements are true, the third statement is

A.true

B.false

C.uncertain

Answer & Explanation

Answer: Option A

Explanation:

Of the three, the drugstore has the best selection of postcards.

26. A jar of jelly beans contains more red beans than green.

There are more yellow beans than red.

The jar contains fewer yellow jelly beans than green ones.

If the first two statements are true, the third statement is

A.true

B.false

C.uncertain

Answer & Explanation

Answer: Option B

Explanation:

The first two statements indicate there are more yellow jelly beans than red and green.

II.The logic problems in this set present you with three true statements: Fact 1, Fact 2, and Fact 3.

Then, you are given three more statements (labeled I, II, and III), and you must determine which of these, if any, is also a fact. One or two of the statements could be true; all of the statements could be true; or none of the statements could be true. Choose your answer based solely on the information given in the first three facts.

1. Fact 1: Eyeglass frames cost between \$35 and \$350.

Fact 2: Some eyeglass frames are made of titanium.

Fact 3: Some eyeglass frames are made of plastic.

If the first three statements are facts, which of the following statements must also be a fact?

I: Titanium eyeglass frames cost more than plastic frames.

II: Expensive eyeglass frames last longer than cheap frames.

III: Only a few eyeglass frames cost less than \$35.

A.I only

B.II only

C.I and II only

D.None of the statements is a known fact.

Answer & Explanation

Answer: Option D

Explanation:

There is no information in the facts to support statements I or II. Statement III is clearly wrong because, according to Fact 1, no frames cost less than \$35.

2. Fact 1: Most stuffed toys are stuffed with beans.

Fact 2: There are stuffed bears and stuffed tigers.

Fact 3: Some chairs are stuffed with beans.

If the first three statements are facts, which of the following statements must also be a fact?

I: Only children's chairs are stuffed with beans.

II: All stuffed tigers are stuffed with beans.

III: Stuffed monkeys are not stuffed with beans.

A.I only

B.II only

C.II and III only

D.None of the statements is a known fact.

Answer & Explanation

Answer: Option D

Explanation:

None of the three statements is supported by the known facts.

3. Fact 1: Mary said, "Ann and I both have cats."

Fact 2: Ann said, "I don't have a cat."

Fact 3: Mary always tells the truth, but Ann sometimes lies.

If the first three statements are facts, which of the following statements must also be a fact?

I: Ann has a cat.

II: Mary has a cat.

III: Ann is lying.

A.I only

B.II only

C.I and II only

D.All the statements are facts.

Answer & Explanation

Answer: Option D

Explanation:

If Mary always tells the truth, then both Ann and Mary have cats (statements I and II), and Ann is lying (statement III). So all the statements are facts.

4. Fact 1: Pictures can tell a story.

Fact 2: All storybooks have pictures.

Fact 3: Some storybooks have words.

If the first three statements are facts, which of the following statements must also be a fact?

I: Pictures can tell a story better than words can.

II: The stories in storybooks are very simple.

III: Some storybooks have both words and pictures.

A.I only

B. II only

C. III only

D. None of the statements is a known fact.

Answer & Explanation

Answer: Option C

Explanation:

Statements I and II are not supported by the facts. Statement III is true because if all storybooks have pictures and only some have words, then some storybooks have both words and pictures.

5. Fact 1: Some pens don't write.

Fact 2: All blue pens write.

Fact 3: Some writing utensils are pens.

If the first three statements are facts, which of the following statements must also be a fact?

I: Some writing utensils don't write.

II: Some writing utensils are blue.

III: Some blue writing utensils don't write.

A.I only

B. I and II only

C. II and III only

D. None of the statements is a known fact.

Answer & Explanation

Answer: Option B

Explanation:

Since some pens don't write, some writing utensils don't write (statement I). Since there are blue pens and since pens are writing utensils, some writing utensils are blue (statement II). There is not enough information to support statement III.

6. Fact 1: Islands are surrounded by water.

Fact 2: Maui is an island.

Fact 3: Maui was formed by a volcano.

If the first three statements are facts, which of the following statements must also be a fact?

I: Maui is surrounded by water.

II: All islands are formed by volcanoes.

III: All volcanoes are on islands.

A.I only

B. II only

C. II and III only

D. None of the statements is a known fact.

Answer & Explanation

Answer: Option A

Explanation:

Since Maui is an island and islands are surrounded by water, Maui must be surrounded by water. There is not enough information to support statements II and III.

7. Fact 1: Robert has four vehicles.

Fact 2: Two of the vehicles are red.

Fact 3: One of the vehicles is a minivan.

If the first three statements are facts, which of the following statements must also be a fact?

I: Robert has a red minivan.

II: Robert has three cars.

III: Robert's favorite color is red.

A.I only

B. II only

C. II and III only

D. None of the statements is a known fact.

Answer & Explanation

Answer: Option D

Explanation:

There is not enough information to support any of the statements. Robert is known to have a minivan, but it is not known which of his vehicles is red. Robert may have a pickup or sport utility vehicle, so the second statement cannot be supported. There is no way to know if Robert's favorite color is red (statement III).

8. Fact 1: All hats have brims.

1:

Fact 2: There are black hats and blue hats.

2:

Fact 3: Baseball caps are hats.

3:

If the first three statements are facts, which of the following statements must also be a fact?

- I: All caps have brims.
II: Some baseball caps are blue.
III: Baseball caps have no brims.

- A.I only
B.II only
C.II and III only
D.None of the statements is a known fact.

Answer & Explanation

Answer: Option D

Explanation:

All baseball caps have brims, since baseball caps are hats (Fact 3) and all hats have brims (Fact 1). This rules out statement III, but it doesn't follow that all caps, a category that may include caps that are not baseball caps, have brims (statement I). Statement II cannot be confirmed, either, since it is possible, given the information, that all baseball caps are black.

Read the question carefully and choose the correct answer.

1. At the baseball game, Henry was sitting in seat 253. Marla was sitting to the right of Henry in seat 254. In the seat to the left of Henry was George. Inez was sitting to the left of George.

Which seat is Inez sitting in?

- A.251
B.254
C.255
D.256

Answer & Explanation

Answer: Option A

Explanation:

If George is sitting at Henry's left, George's seat is 252. The next seat to the left, then, is 251.

2. As they prepare for the state championships, one gymnast must be moved from the Level 2 team to the Level 1 team. The coaches will move the gymnast who has won the biggest prize and who has the most experience. In the last competition, Roberta won a bronze medal and has competed seven times before. Jamie has won a silver medal and has competed fewer times than Roberta. Beth has won a higher medal than Jamie and has competed more times than Roberta. Michele has won a bronze medal, and it is her third time competing. Who will be moved to the Level 1 team?

- A.Roberta
B.Beth
C.Michele
D.Jamie

Answer & Explanation

Answer: Option B

Explanation:

Beth won the biggest prize, described as a higher medal than Jamie's, which we've been told was a silver medal. Roberta and Michele both won bronze medals, which are lower ranking medals than silver. Beth is also described as having competed more times than Roberta who has competed seven times. Jamie is described as having competed fewer times than Roberta, and Michele has competed three times. Therefore, Beth has competed more times than the others and has won the biggest prize to date.

3. Four friends in the sixth grade were sharing a pizza. They decided that the oldest friend would get the extra piece. Randy is two months older than Greg, who is three months younger than Ned. Kent is one month older than Greg. Who should get the extra piece of pizza?

- A.Randy
B.Greg
C.Ned
D.Kent

Answer & Explanation

Answer: Option C

Explanation:

If Randy is two months older than Greg, then Ned is three months older than Greg and one month older than Randy. Kent is younger than both Randy and Ned. Ned is the oldest.

4. The high school math department needs to appoint a new chairperson, which will be based on seniority. Ms. West has less seniority than Mr. Temple, but more than Ms. Brody. Mr. Rhodes has more seniority than Ms. West, but less than Mr. Temple. Mr. Temple doesn't want the job. Who will be the new math department chairperson?

- A.Mr. Rhodes
B.Mr. Temple
C.Ms. West
D.Ms. Brody

Answer & Explanation

Answer: Option A

Explanation:

Mr. Temple has the most seniority, but he does not want the job. Next in line is Mr. Rhodes, who has more seniority than Ms. West or Ms. Brody.

5. Danielle has been visiting friends in Ridge-wood for the past two weeks. She is leaving tomorrow morning and her flight is very early. Most of her friends live fairly close to the airport. Madison lives ten miles away. Frances lives five miles away, Samantha, seven miles. Alexis is farther away than Frances, but closer than Samantha. Approximately how far away from the airport is Alexis?

- A.nine miles

- B. seven miles
- C. eight miles
- D. six miles

Answer & Explanation

Answer: Option D

Explanation:

Alexis is farther away than Frances, who is five miles away, and closer than Samantha, who is seven miles away.

6. Nurse Kemp has worked more night shifts in a row than Nurse Rogers, who has worked five.

Nurse Miller has worked fifteen night shifts in a row, more than Nurses Kemp and Rogers combined. Nurse Calvin has worked eight night shifts in a row, less than Nurse Kemp. How many night shifts in a row has Nurse Kemp worked?

- A. eight
- B. nine
- C. ten
- D. eleven

Answer & Explanation

Answer: Option B

Explanation:

Nurse Kemp has worked more shifts in a row than Nurse Calvin; therefore, Kemp has worked more than eight shifts. The number of Kemp's shifts plus the number of Rogers's shifts (five) cannot equal fifteen or more, the number of Miller's shifts. Therefore, Kemp has worked nine shifts in a row ($5 + 9 = 14$).

7. Children are in pursuit of a dog whose leash has broken. James is directly behind the dog. Ruby is behind James. Rachel is behind Ruby. Max is ahead of the dog walking down the street in the opposite direction. As the children and dog pass, Max turns around and joins the pursuit. He runs in behind Ruby. James runs faster and is alongside the dog on the left. Ruby runs faster and is alongside the dog on the right. Which child is directly behind the dog?

- A. James
- B. Ruby
- C. Rachel
- D. Max

Answer & Explanation

Answer: Option D

Explanation:

After all the switches were made, Max is directly behind the dog, James is alongside the dog on the left, Ruby is alongside the dog on the right, and Rachel is behind Max.

8. Ms. Forest likes to let her students choose who their partners will be; however, no pair of students may work together more than seven class periods in a row. Adam and Baxter have studied together seven class periods in a row. Carter and Dennis have worked together three class

periods in a row. Carter does not want to work with Adam. Who should be assigned to work with Baxter?

- A. Carter
- B. Adam
- C. Dennis
- D. Forest

Answer & Explanation

Answer: Option A

Explanation:

Baxter should be assigned to study with Carter. Baxter cannot be assigned with Adam, because they have already been together for seven class periods. If Baxter is assigned to work with Dennis, that would leave Adam with Carter, but Carter does not want to work with Adam.

9. Four defensive football players are chasing the opposing wide receiver, who has the ball. Calvin is directly behind the ball carrier. Jenkins and Burton are side by side behind Calvin. Zeller is behind Jenkins and Burton. Calvin tries for the tackle but misses and falls. Burton trips. Which defensive player tackles the receiver?

- A. Burton
- B. Zeller
- C. Jenkins
- D. Calvin

Answer & Explanation

Answer: Option C

Explanation:

After all the switching was done, Jenkins was directly behind the receiver. Calvin and Burton had fallen. Zeller remained in the rear.

10. In a four-day period Monday through Thursday each of the following temporary office workers worked only one day, each a different day. Ms. Johnson was scheduled to work on Monday, but she traded with Mr. Carter, who was originally scheduled to work on Wednesday. Ms. Falk traded with Mr. Kirk, who was originally scheduled to work on Thursday. After all the switching was done, who worked on Tuesday?

- A. Mr. Carter
- B. Ms. Falk
- C. Ms. Johnson
- D. Mr. Kirk

Answer & Explanation

Answer: Option D

Explanation:

After all the switches were made, Mr. Kirk worked on Tuesday. Mr. Carter worked on Monday, Ms. Johnson on Wednesday, and Ms. Falk on Thursday.

LOGICAL GAMES

Read the below passage carefully and answer the questions:

I. The government of an island nation is in the process of deciding how to spend its limited

income. It has \$7 million left in its budget and eight programs to choose among. There is no provision in the constitution to have a surplus, and each program has requested the minimum amount they need; in other words, no program may be partially funded. The programs and their funding requests are:

- * Hurricane preparedness: \$2.5 million
- * Harbor improvements: \$1 million
- * School music program: \$0.5 million
- * Senate office building remodeling: \$1.5 million
- * Agricultural subsidy program: \$2 million
- * National radio: \$0.5 million
- * Small business loan program: \$3 million
- * International airport: \$4 million

1. Senators from urban areas are very concerned about assuring that there will be funding for a new international airport. Senators from rural areas refuse to fund anything until money for agricultural subsidies is appropriated. If the legislature funds these two programs, on which of the following could they spend the rest of the money?

- A.the school music program and national radio
- B.hurricane preparedness
- C.harbor improvements and the school music program
- D.small business loan program
- E.national radio and senate office building remodeling

Answer & Explanation

Answer: Option A

Explanation:

The total cost of the school music program and national radio is \$1 million, the amount left after the international airport and agricultural subsidies are funded.

International airport + Agricultural subsidy program

\$4 million + \$2 million = \$6 million

school music program and national radio is \$1 million.

Hence, Total \$7 million.

2. If the legislature decides to fund the agricultural subsidy program, national radio, and the small business loan program, what two other programs could they fund?

- A.harbor improvements and international airport
- B.harbor improvements and school music program
- C.hurricane preparedness and school music program
- D.hurricane preparedness and international airport
- E.harbor improvements and hurricane preparedness

Answer & Explanation

Answer: Option B

Explanation:

The only two programs that total 1.5 million dollars are the harbor improvements and school

music program.

3. If the legislature decides to fund the agricultural subsidy program, national radio, and the small business loan program, the only other single program that can be funded is

- A.hurricane preparedness.
- B.harbor improvements.
- C.school music program.
- D.senate office building remodeling.
- E.international airport.

Answer & Explanation

Answer: Option D

Explanation:

The total of the three programs (2 million + 0.5 million + 3 million) is 5.5 million. That leaves 1.5 million (7 million - 5.5 million), and the only single program needing that amount is the senate office building remodeling.

II. At a small company, parking spaces are reserved for the top executives: CEO, president, vice president, secretary, and treasurer with the spaces lined up in that order. The parking lot guard can tell at a glance if the cars are parked correctly by looking at the color of the cars. The cars are yellow, green, purple, red, and blue, and the executives names are Alice, Bert, Cheryl, David, and Enid.

- * The car in the first space is red.
- * A blue car is parked between the red car and the green car.
- * The car in the last space is purple.
- * The secretary drives a yellow car.
- * Alice's car is parked next to David's.
- * Enid drives a green car.
- * Bert's car is parked between Cheryl's and Enid's.
- * David's car is parked in the last space.

1. Who is the secretary?

- A.Enid
- B.David
- C.Cheryl
- D.Bert
- E.Alice

Answer & Explanation

Answer: Option E

Explanation:

Cheryl cannot be the secretary, since she's the CEO, nor can Enid, because she drives a green car, and the secretary drives a yellow car. David's, the purple car, is in the last space. Alice is the secretary, because her car is parked next to David's, which is where the secretary's car is parked.

2. Who is the CEO ?

- A. Alice
- B. Bert
- C. Cheryl
- D. David
- E. Enid

Answer & Explanation

Answer: Option C

Explanation:

The CEO drives a red car and parks in the first space. Enid drives a green car; Bert's car is not in the first space; David's is not in the first space, but the last. Alice's car is parked next to David's, so Cheryl is the CEO.

3. What color is the vice president's car?

- A. green
- B. yellow
- C. blue
- D. purple
- E. red

Answer & Explanation

Answer: Option A

Explanation:

The vice president's car cannot be red, because that is the CEO's car, which is in the first space. Nor can it be purple, because that is the treasurer's car, which is in the last space, or yellow, because that is the secretary's. The president's car must be blue, because it is parked between a red car (in the first space) and a green car, which must be the vice president's.

III. Five cities all got more rain than usual this year. The five cities are: Last Stand, Mile City, New Town, Olliopolis, and Polberg. The cities are located in five different areas of the country: the mountains, the forest, the coast, the desert, and in a valley. The rainfall amounts were: 12 inches, 27 inches, 32 inches, 44 inches, and 65 inches.

* The city in the desert got the least rain; the city in the forest got the most rain.

* New Town is in the mountains.

* Last Stand got more rain than Olliopolis.

* Mile City got more rain than Polberg, but less rain than New Town.

* Olliopolis got 44 inches of rain.

* The city in the mountains got 32 inches of rain; the city on the coast got 27 inches of rain.

1. Which city got the most rain?

- A. Last Stand
- B. Mile City
- C. New Town
- D. Olliopolis

E. Polberg

Answer & Explanation

Answer: Option A

Explanation:

Olliopolis got 44 inches of rain. Last Stand got more rain than that, so it got 65 inches, which is the most.

2. How much rain did Mile City get?

- A. 12 inches
- B. 27 inches
- C. 32 inches
- D. 44 inches
- E. 65 inches

Answer & Explanation

Answer: Option B

Explanation:

Olliopolis got 44 inches of rain, Last Stand got 65, and Polberg got 12. New Town is in the mountains, and the city in the mountains got 32 inches of rain. Therefore, Mile City got 27.

3. Which city is in the desert ?

- A. Last Stand
- B. Mile City
- C. New Town
- D. Olliopolis
- E. Polberg

Answer & Explanation

Answer: Option E

Explanation:

The city that got the least rain is in the desert. New Town is in the mountains. Last Stand got more rain than Olliopolis, so it cannot be the city with the least rain; also, Mile City cannot be the city with the least rain. Olliopolis got 44 inches of rain. Therefore, Polberg is in the desert and got 12 inches of rain.

4. Where is Olliopolis located?

- A. the mountains
- B. the coast
- C. in a valley
- D. the desert
- E. the forest

Answer & Explanation

Answer: Option C

Explanation:

Olliopolis got 44 inches of rain, so it is not in the desert or the forest. The city in the mountains got 32 inches of rain; the coast 27. Therefore, Olliopolis is in a valley.

IV. Five roommates Randy, Sally, Terry, Uma, and Vernon each do one housekeeping task mopping, sweeping, laundry, vacuuming, or dusting one day a week, Monday through Friday.

* Vernon does not vacuum and does not do his task on Tuesday.
* Sally does the dusting, and does not do it on Monday or Friday.

* The mopping is done on Thursday.

* Terry does his task, which is not vacuuming, on Wednesday.

* The laundry is done on Friday, and not by Uma.

* Randy does his task on Monday.

1. What task does Terry do on Wednesday?

A. vacuuming

B. dusting

C. mopping

D. sweeping

E. laundry

Answer & Explanation

Answer: Option D

Explanation:

Terry does not dust, mop, do laundry, or vacuum. Therefore, Terry does the sweeping on Wednesday.

2. What day does Uma do her task?

A. Monday

B. Tuesday

C. Wednesday

D. Thursday

E. Friday

Answer & Explanation

Answer: Option D

Explanation:

Uma does the mopping, which is done on Thursday.

3. What task does Vernon do?

A. vacuuming

B. dusting

C. mopping

D. sweeping

E. laundry

Answer & Explanation

Answer: Option E

Explanation:

Vernon does not vacuum, dust, or sweep. Randy does the vacuuming, Sally does the dusting, Terry does the sweeping leaving laundry and mopping for Uma and Vernon. Uma does not do laundry; therefore, she must mop, and Vernon does the laundry.

4. What day is the vacuuming done?

A. Friday

B. Monday

C. Tuesday

D. Wednesday

E. Thursday

Answer & Explanation

Answer: Option B

Explanation:

Dusting is on Tuesday, sweeping is on Wednesday, mopping is on Thursday, and laundry is on Friday. Therefore, the vacuuming is done on Monday.

5. When does Sally do the dusting?

A. Friday

B. Monday

C. Tuesday

D. Wednesday

E. Thursday

Answer & Explanation

Answer: Option C

Explanation:

Dusting must be done on Tuesday, Wednesday, or Thursday. However, the mopping is done on Thursday, and Terry does his task on Wednesday. Therefore, Sally does the dusting on Tuesday.

LOGICAL DEDUCTION

1. **Statements:** All bags are cakes. All lamps are cakes.

Conclusions:

1. Some lamps are bags.

2. No lamp is bag.

A. Only conclusion I follows

B. Only conclusion II follows

C. Either I or II follows

D.Neither I nor II follows

E. Both I and II follow

Answer & Explanation

Answer: Option C

Explanation:

Since the middle term 'cakes' is not distributed even once in the premises, no definite conclusion follows. However, I and II involve only the extreme terms and form a complementary pair. So, either I or II follows.

2.Statements: All mangoes are golden in colour. No golden-coloured things are cheap.

Conclusions:

1. All mangoes are cheap.
2. Golden-coloured mangoes are not cheap.

A.Only conclusion I follows

B. Only conclusion II follows

C.Either I or II follows

D.Neither I nor II follows

E. Both I and II follow

Answer & Explanation

Answer: Option B

Explanation:

Clearly, the conclusion must be universal negative and should not contain the middle term. So, it follows that 'No mango is cheap'. Since all mangoes are golden in colour, we may substitute 'mangoes' with 'golden-coloured mangoes'. Thus, II follows.

3.Statements: Some kings are queens. All queens are beautiful.

Conclusions:

1. All kings are beautiful.
2. All queens are kings.

A.Only conclusion I follows

B. Only conclusion II follows

C.Either I or II follows

D.Neither I nor II follows

E. Both I and II follow

Answer & Explanation

Answer: Option D

Explanation:

Since one premise is particular, the conclusion must be particular. So, neither I nor II follows.

4.Statements: Some doctors are fools. Some fools are rich.

Conclusions:

1. Some doctors are rich
2. Some rich are doctors.

A.Only conclusion I follows

B. Only conclusion II follows

C.Either I or II follows

D.Neither I nor II follows

E. Both I and II follow

Answer & Explanation

Answer: Option D

Explanation:

Since both the premises are particular, no definite conclusion follows.

5.Statements: All roads are waters. Some waters are boats.

Conclusions:

1. Some boats are roads.
2. All waters are boats.

A.Only conclusion I follows

B. Only conclusion II follows

C.Either I or II follows

D.Neither I nor II follows

E. Both I and II follow

Answer & Explanation

Answer: Option D

Explanation:

The first premise is A type and distributes the subject. So, the middle term 'waters' which forms its predicate, is not distributed. The second premise is I type and does not distribute either subject or predicate. So, the middle term 'waters' forming its subject is not distributed. Since the middle term is not distributed even once in the premises, no definite conclusion follows.

6. Statements: No bat is ball. No ball is wicket.

Conclusions:

1. No bat is wicket.
2. All wickets are bats.

A.Only conclusion I follows

B. Only conclusion II follows

C.Either I or II follows

D.Neither I nor II follows

E. Both I and II follow

Answer & Explanation

Answer: Option D

Explanation:

Since both the premises are negative, no definite conclusion follows.

7. Statements: All flowers are trees. No fruit is tree.

Conclusions:

1. No fruit is flower.
2. Some trees are flowers.

- A. Only conclusion I follows
- B. Only conclusion II follows
- C. Either I or II follows
- D. Neither I nor II follows
- E. Both I and II follow

Answer & Explanation

Answer: Option E

Explanation:

As discussed above, the conclusion must be universal negative and should not contain the middle term. So, it follows that 'No flower is fruit'. I is the converse of this conclusion and thus it follows. II is the converse of the first premise and so it also holds.

8. Statements: Some adults are boys. Some boys are old.

Conclusions:

- 1. Some adults are not old.
- 2. Some boys are not old.

- A. Only conclusion I follows
- B. Only conclusion II follows
- C. Either I or II follows
- D. Neither I nor II follows
- E. Both I and II follow

Answer & Explanation

Answer: Option D

Explanation:

Both the premises are I-type propositions and as such, the middle term 'boys' is not distributed even once in the premises. So, no definite conclusion follows.

9. Statements: Every minister is a student. Every student is inexperienced.

Conclusions:

- 1. Every minister is inexperienced.
- 2. Some inexperienced are students.

- A. Only conclusion I follows
- B. Only conclusion II follows
- C. Either I or II follows
- D. Neither I nor II follows
- E. Both I and II follow

Answer & Explanation

Answer: Option E

Explanation:

'Every' is equivalent to 'All'. Thus, since both the premises are universal and affirmative, the conclusion must be universal affirmative and should not contain the middle term. So, I follows. II is the converse of the second premise and thus it also holds.

10. Statements: All roads are poles. No pole is a house.

Conclusions:

- 1. Some roads are houses.
- 2. Some houses are poles.

- A. Only conclusion I follows
- B. Only conclusion II follows
- C. Either I or II follows
- D. Neither I nor II follows
- E. Both I and II follow

Answer & Explanation

Answer: Option D

Explanation:

Since both the premises are universal and one premise is negative, the conclusion must be universal negative. So, neither I nor II follows.

11. Statements: All fish are tortoise. No tortoise is a crocodile.

Conclusions:

- 1. No crocodile is a fish.
- 2. No fish is a crocodile.

- A. Only conclusion I follows
- B. Only conclusion II follows
- C. Either I or II follows
- D. Neither I nor II follows
- E. Both I and II follow

Answer & Explanation

Answer: Option E

Explanation:

Since both the premises are universal and one premise is negative, the conclusion must be universal negative. Also, the conclusion should not contain the middle term. So, II follows; I is the converse of II and thus it also holds.

12. Statements: Some dedicated souls are angels. All social workers are angels.

Conclusions:

- 1. Some dedicated souls are social workers.
- 2. Some social workers are dedicated souls.

- A. Only conclusion I follows
- B. Only conclusion II follows
- C. Either I or II follows
- D. Neither I nor II follows
- E. Both I and II follow

Answer & Explanation

Answer: Option D

Explanation:

The first premise is an I type proposition. So, the middle term 'angels' forming the predicate is not distributed. The second premise is an A type proposition. So, the middle term 'angels' forming the predicate is not distributed. Since the middle term is not distributed even once in the premises, no definite conclusion follows.

13. **Statements:** No gentleman is poor. All gentlemen are rich.

Conclusions:

1. No poor man is rich.
2. No rich man is poor.

- A. Only conclusion I follows
B. Only conclusion II follows
C. Either I or II follows
D. Neither I nor II follows

E. Both I and II follow

Answer & Explanation

Answer: Option D

Explanation:

The first premise is an E-type proposition, So, the middle term 'gentleman' forming the subject is distributed. The second premise is an A-type proposition. So, the middle term 'gentlemen' forming the subject is distributed. Since the middle term is distributed twice, the conclusion cannot be universal. Since one premise is negative, the conclusion must be negative. Thus, it follows that 'Some rich men are not poor'. Thus, neither I nor II follows.

14. **Statements:** Some swords are sharp. All swords are rusty

Conclusions:

1. Some rusty things are sharp.
2. Some rusty things are not sharp.

- A. Only conclusion I follows
B. Only conclusion II follows
C. Either I or II follows
D. Neither I nor II follows

E. Both I and II follow

Answer & Explanation

Answer: Option A

Explanation:

Since one premise is particular, the conclusion must be particular and should not contain the middle term. So, I follows. Since both the premises are affirmative, the conclusion cannot be negative. Thus, II does not follow.

15. **Statements:** All film stars are playback singers. All film directors are film stars.

Conclusions:

1. All film directors are playback singers.
2. Some film stars are film directors.

- A. Only conclusion I follows
B. Only conclusion II follows
C. Either I or II follows
D. Neither I nor II follows
E. Both I and II follow

Answer & Explanation

Answer: Option E

Explanation:

Since both the premises are universal and affirmative, the conclusion must be universal affirmative and should not contain the middle term. So, I follows. II is the converse of the second premise and so it also holds.

16. **Statements:** All hill stations have a sun-set point. X is a hill station.

Conclusions:

1. X has a sun-set point.
2. Places other than hill stations do not have sun-set points.

- A. Only conclusion I follows
B. Only conclusion II follows
C. Either I or II follows
D. Neither I nor II follows
E. Both I and II follow

Answer & Explanation

Answer: Option A

Explanation:

Since both the premises are universal and affirmative, the conclusion must be universal affirmative and should not contain the middle term. So, only I follows.

17. **Statements:** Some dreams are nights. Some nights are days.

Conclusions:

1. All days are either nights or dreams.
2. Some days are nights.

- A. Only conclusion I follows
B. Only conclusion II follows
C. Either I or II follows
D. Neither I nor II follows
E. Both I and II follow

Answer & Explanation

Answer: Option B

Explanation:

Since both the premises are particular, no definite conclusion follows. However, II is the converse of the second premise and thus it holds.

18.Statements: All jungles are tigers. Some tigers are horses.

Conclusions:

1. Some horses are jungles.
2. No horse is jungle.

A.Only conclusion I follows

B. Only conclusion II follows

C.Either I or II follows

D.Neither I nor II follows

E. Both I and II follow

Answer & Explanation

Answer: Option C

Explanation:

Since the middle term 'tigers' is not distributed even once in the premises, no definite conclusion follows. However, I and II involve only the extreme terms and form a complementary pair. So, either I or II follows.

DATA SUFFICIENCY

1.Question: What is the code for 'sky' in the code language ?

Statements:

1. In the code language, 'sky is clear' is written as 'de ra fa'.
2. In the same code language, 'make it clear' is written as 'de ga jo'.

A.I alone is sufficient while II alone is not sufficient

B. II alone is sufficient while I alone is not sufficient

C.Either I or II is sufficient

D.Neither I nor II is sufficient

E. Both I and II are sufficient

Answer & Explanation

Answer: Option D

Explanation:

The only word common to I and II is 'clear' and as such, only the code for 'clear' can be ascertained from the given information.

2. Question: How many children are there between P and Q in a row of children ?

Statements:

1. P is fifteenth from the left in the row.
2. Q is exactly in the middle and there are ten children towards his right.

A.I alone is sufficient while II alone is not sufficient

B. II alone is sufficient while I alone is not sufficient

C.Either I or II is sufficient

D.Neither I nor II is sufficient

E. Both I and II are sufficient

Answer & Explanation

Answer: Option E

Explanation:

From II, Q being in the middle, there are 10 children to his right as well as to his left. So, Q is 11th from the left. From I, P is 15th from the left.

Thus, from both I and II, we conclude that there are 3 children between P and Q.

3. Question: How is T related to K?

Statements:

1. R's sister J has married Ts brother L, who is the only son of his parents.
2. K is the only daughter of L and J.

A.I alone is sufficient while II alone is not sufficient

B. II alone is sufficient while I alone is not sufficient

C.Either I or II is sufficient

D.Neither I nor II is sufficient

E. Both I and II are sufficient

Answer & Explanation

Answer: Option E

Explanation:

From I, we know that L is T's brother and J's husband. Since L is the only son of his parents, T is L's sister.

From II, we know that K is L's daughter.

Thus, from I and II, we conclude that T is the sister of K's father i.e. T is K's aunt.

4. Question: How is J related to P ?

Statements:

1. M is brother of P and T is sister of P.
2. P's mother is married to J's husband who has one son and two daughters.

A.I alone is sufficient while II alone is not sufficient

B. II alone is sufficient while I alone is not sufficient

C.Either I or II is sufficient

D.Neither I nor II is sufficient

E. Both I and II are sufficient

Answer & Explanation

Answer: Option B

Explanation:

From II, we know that P's mother is married to J's husband, which means that J is P's mother.

5. Question: How is X related to Y ?

Statements:

1. Y and Z are children of D who is wife of X.
2. R's sister X is married to Y's father.

A.I alone is sufficient while II alone is not sufficient

B. II alone is sufficient while I alone is not sufficient

C.Either I or II is sufficient

D.Neither I nor II is sufficient

E. Both I and II are sufficient

Answer & Explanation

Answer: Option C

Explanation:

From I, we conclude that Y is the child of D who is wife of X i.e. X is Y's father.

From II, X is married to Y's father. This implies that X is Y's mother.

6. Question: Who is to the immediate right of P among five persons P, Q, R, S and T facing North

?

Statements:

1. R is third to the left of Q and P is second to the right of R.

2. Q is to the immediate left of T who is second to the right of P.

A.I alone is sufficient while II alone is not sufficient

B. II alone is sufficient while I alone is not sufficient

C.Either I or II is sufficient

D.Neither I nor II is sufficient

E. Both I and II are sufficient

Answer & Explanation

Answer: Option C

Explanation:

From I, we have the order: R, -, P, Q.

From II, we have the order: P, Q, T.

Clearly, each one of the above two orders indicates that Q is to the immediate right of P.

7. Question: Who is to the immediate right of P among five persons P, Q, R, S and T facing North

?

Statements:

1. R is third to the left of Q and P is second to the right of R.

2. Q is to the immediate left of T who is second to the right of P.

A.I alone is sufficient while II alone is not sufficient

B. II alone is sufficient while I alone is not sufficient

C.Either I or II is sufficient

D.Neither I nor II is sufficient

E. Both I and II are sufficient

Answer & Explanation

Answer: Option C

Explanation:

From I, we have the order: R, -, P, Q.

From II, we have the order: P, Q, T.

Clearly, each one of the above two orders indicates that Q is to the immediate right of P.

8. Question: On which date of the month was Anjali born in February 2004 ?

Statements:

1. Anjali was born on an even date of the month.

2. Anjali's birth date was a prime number.

A.I alone is sufficient while II alone is not sufficient

B. II alone is sufficient while I alone is not sufficient

C.Either I or II is sufficient

D.Neither I nor II is sufficient

E. Both I and II are sufficient

Answer & Explanation

Answer: Option E

Explanation:

From I and II, we conclude that Anjali was born in February 2004 on a date which is an even prime number. Since the only even prime number is 2, so Anjali was born on 2nd February, 2004.

9. Question: How is X related to Y?

Statements:

1. Y says, "I have only one brother".

2. X says, "I have only one sister".

A.I alone is sufficient while II alone is not sufficient

B. II alone is sufficient while I alone is not sufficient

C.Either I or II is sufficient

D.Neither I nor II is sufficient

E. Both I and II are sufficient

Answer & Explanation

Answer: Option D

Explanation:

The statements in I and II do not provide any clue regarding relation between X and Y.

10. Question: How is F related to P?

Statements:

1. P has two sisters M and N.

2. F's mother is sister of M's father.

A.I alone is sufficient while II alone is not sufficient

B. II alone is sufficient while I alone is not sufficient

C.Either I or II is sufficient

- D.Neither I nor II is sufficient
E. Both I and II are sufficient

Answer & Explanation

Answer: Option E

Explanation:

From I and II, we conclude that P is M's brother and so M's father is P's father. So, F is the child of the sister of P's father i.e. F's mother is P's aunt or F is P's cousin.

11. **Question:** When is Manohar's birthday this year ?

Statements:

1. It is between January 13 and 15, January 13 being Wednesday.
2. It is not on Friday.

- A.I alone is sufficient while II alone is not sufficient
B. II alone is sufficient while I alone is not sufficient

- C.Either I or II is sufficient
D.Neither I nor II is sufficient
E. Both I and II are sufficient

Answer & Explanation

Answer: Option A

Explanation:

From I, we conclude that Manohar's birthday is on January 14, which is Thursday.

12. **Question:** How is 'No' coded in the code language ?

Statements:

1. 'Ne Pa Sic Lo' means 'But No None And' and 'Pa Lo Le Ne' means 'If None And But'.
2. 'Le Se Ne Sic' means 'If No None Will' and 'Le Pi Se Be' means 'Not None If All'.

- A.I alone is sufficient while II alone is not sufficient
B. II alone is sufficient while I alone is not sufficient

- C.Either I or II is sufficient
D.Neither I nor II is sufficient

- E. Both I and II are sufficient

Answer & Explanation

Answer: Option A

Explanation:

In the two statements given in I, the common words are 'But', 'None', 'And' and the common code words are 'Ne', 'Pa', 'Lo'. So, 'Ne', 'Pa' and 'Lo' are codes for 'But', 'None' and 'And'. Thus, in the first statement, 'Sic' is the code for 'No'.

13. **Question:** Who among P, Q, T, V and M is exactly in the middle when they are arranged in ascending order of their heights ?

Statements:

1. V is taller than Q but shorter than M.
2. T is taller than Q and M but shorter than P.

- A.I alone is sufficient while II alone is not sufficient
B. II alone is sufficient while I alone is not sufficient
C.Either I or II is sufficient
D.Neither I nor II is sufficient
E. Both I and II are sufficient

Answer & Explanation

Answer: Option E

Explanation:

From I, we have: M > V > Q.

From II, we have: T > Q, T > M, P > T.

Combining the above two, we have: P > T > M > V > Q i.e. Q < v < m < t < p. < p=""></v < m < t < p. <>

Clearly, M is in the middle.

14. **Question:** Which code word stands for 'good' in the coded sentence 'sin co bye' which means 'He is good' ?

Statements:

1. In the same code language, 'co mot det' means 'They are good'.
2. In the same code language, 'sin mic bye' means 'He is honest'.

- A.I alone is sufficient while II alone is not sufficient

- B. II alone is sufficient while I alone is not sufficient

- C.Either I or II is sufficient

- D.Neither I nor II is sufficient

- E. Both I and II are sufficient

Answer & Explanation

Answer: Option C

Explanation:

In the given statement and I, the common word is 'good' and the common code word is 'co'. So, 'co' is the code for 'good'.

In the given statement and II, the common words are 'He' and 'is' and the common code words are 'sin' and 'bye'. So 'sin' and 'bye' are the codes for 'He' and 'is'. Thus, in the given statement, 'co' is the code for 'good'.

15. **Question:** What is the numerical code for 'water' in a certain code ?

Statements:

1. The code for 'give me water' is '719'.
2. The code for 'you can bring water for me' is written as '574186'.

- A.I alone is sufficient while II alone is not sufficient

- B. II alone is sufficient while I alone is not sufficient

- C.Either I or II is sufficient

- D.Neither I nor II is sufficient

- E. Both I and II are sufficient

Answer & Explanation

Answer: Option D

Explanation:

In I and II, the common words are 'me' and 'water' and the common code numbers are '7' and '1'. So, the code for 'water' is either '7' or '1'.

16. **Question:** A is D's brother. F is mother of D. How is D related to A?

Statements:

1. F has only one son and one daughter.
2. A is the only son of P who has two children.

A.I alone is sufficient while II alone is not sufficient

B. II alone is sufficient while I alone is not sufficient

C.Either I or II is sufficient

D.Neither I nor II is sufficient

E. Both I and II are sufficient

Answer & Explanation

Answer: Option C

Explanation:

A is D's brother and F is D's mother. So, A is F's son.

From I, we conclude that F has one son A and one daughter D. So, D is A's sister. From II, A is P's only son. But, F is A's mother. So, P is A's father. Also, P has two children - A and D.

Since P has only one son, so D is P's daughter. Thus, D is A's sister.

17. **Question:** How many visitors saw the exhibition yesterday ?

Statements:

1. Each entry pass holder can take up to three persons with him/her.
2. In all, 243 passes were sold yesterday.

A.I alone is sufficient while II alone is not sufficient

B. II alone is sufficient while I alone is not sufficient

C.Either I or II is sufficient

D.Neither I nor II is sufficient

E. Both I and II are sufficient

Answer & Explanation

Answer: Option D

Explanation:

From I and II, we find that maximum (243×3) i.e. 729 visitors saw the exhibition.

But the exact number cannot be determined.

18. **Question:** Gaurav ranks eighteenth from the top in a class. What is his rank from the last?

Statements:

1. There are 47 students in the class.
2. Jatin who ranks 10th in the same class, ranks 38th from the last.

A.I alone is sufficient while II alone is not sufficient

B. II alone is sufficient while I alone is not sufficient

C.Either I or II is sufficient

D.Neither I nor II is sufficient

E. Both I and II are sufficient

Answer & Explanation

Answer: Option C

Explanation:

From I, we conclude that in a class of 47 students, Gaurav ranks 18th from the top and hence 30th from the last.

From II, we conclude that there are 9 students above and 37 students below Jatin in rank.

Thus, there are $(9 + 1 + 37) = 47$ students in the class.

So, Gaurav who ranks 18th from the top, is 30th from the last.

19. **Question:** What is the rank of P from the bottom in a class of 30 students ?

Statements:

1. M is third from the top and there are five students between M and P.
2. The rank of K is fourth from the bottom and there are 17 students between K and P.

A.I alone is sufficient while II alone is not sufficient

B. II alone is sufficient while I alone is not sufficient

C.Either I or II is sufficient

D.Neither I nor II is sufficient

E. Both I and II are sufficient

Answer & Explanation

Answer: Option C

Explanation:

From I, we conclude that P is 9th from the top. Thus, in a class of 30 students, P ranks 22nd from the bottom.

From II, we conclude that P is 22nd from the bottom.

20. **Question:** In a row of five buildings - P, Q, R, S and T, which building is in the middle ?

Statements:

1. Buildings S and Q are at the two extreme ends of the row.
2. Building ,T is to the right of building R.

A.I alone is sufficient while II alone is not sufficient

B. II alone is sufficient while I alone is not sufficient

C.Either I or II is sufficient

D.Neither I nor II is sufficient

Answer & Explanation

Answer: Option D

Explanation:

From I, we have the order : S, -, -, -, Q. From II, we have the order : R, T. Combining the above two, we get two possible orders : S, R, T, P, Q or S, P, R, T, Q. Thus, either T or R is in the middle.

ARITHMETIC REASONING

1.A pineapple costs Rs. 7 each. A watermelon costs Rs. 5 each. X spends Rs. 38 on these fruits. The number of pineapples purchased is

- A.2
- B.3
- C.4
- D.Data inadequate

Answer & Explanation

Answer: Option C

Explanation:

Let the number of pineapples and watermelons be x and y respectively.

$$\text{Then, } 7x + 5y = 38 \text{ or } 5y = (38 - 7x) \text{ or } y = \frac{38 - 7x}{5}.$$

Clearly, y is a whole number, only when $(38 - 7x)$ is divisible by 5.

This happens when $x = 4$.

2. A woman says, "If you reverse my own age, the figures represent my husband's age. He is, of course, senior to me and the difference between our ages is one-eleventh of their sum." The woman's age is

- A.23 years
- B.34 years
- C.45 years
- D.None of these

Answer & Explanation

Answer: Option C

Explanation:

Let x and y be the ten's and unit's digits respectively of the numeral denoting the woman's age.

Then, woman's age = $(10X + y)$ years; husband's age = $(10y + x)$ years.

Therefore $(10y + x) - (10X + y) = (1/11)(10y + x + 10x + y)$

$$(9y - 9x) = (1/11)(11y + 11x) = (x + y)$$

$$10x = 8y \quad x = (4/5)y$$

Clearly, y should be a single-digit multiple of 5, which is 5.

So, $x = 4$, $y = 5$.

Hence, woman's age = $10x + y = 45$ years.

3. A girl counted in the following way on the fingers of her left hand : She started by calling the thumb 1, the index finger 2, middle finger 3, ring finger 4, little finger 5 and then reversed direction calling the ring finger 6, middle finger 7 and so on. She counted upto 1994. She ended counting on which finger ?

- A.Thumb
- B.Index finger
- C.Middle finger
- D.Ring finger

Answer & Explanation

Answer: Option B

Explanation:

Clearly, while counting, the numbers associated to the thumb will be : 1, 9, 17, 25,..... i.e. numbers of the form $(8n + 1)$.

Since $1994 = 249 \times 8 + 2$, so 1993 shall correspond to the thumb and 1994 to the index finger.

4. A man has Rs. 480 in the denominations of one-rupee notes, five-rupee notes and ten-rupee notes. The number of notes of each denomination is equal. What is the total number of notes that he has ?

- A.45
- B.60
- C.75
- D.90

Answer & Explanation

Answer: Option D

Explanation:

Let number of notes of each denomination be x .

$$\text{Then, } x + 5x + 10x = 480 \quad 16x = 480 \quad x = 30.$$

Hence, total number of notes = $3x = 90$.

5. What is the product of all the numbers in the dial of a telephone ?

- A.1,58,480
- B.1,59,450
- C.1,59,480
- D.None of these

Answer & Explanation

Answer: Option D

Explanation:

Let the total number of shots be x . Then,

$$\text{Shots fired by A} = \frac{5}{8}x; \quad \text{Shots fired by B} = \frac{3}{8}x.$$

$$\text{Killing shots by A} = \frac{1}{3} \text{ of } \frac{5}{8}x = \frac{5x}{24};$$

$$\text{Shots missed by B} = \frac{1}{2} \text{ of } \frac{3}{8}x = \frac{3x}{16}.$$

$$\therefore \frac{3x}{16} = 27 \quad \text{or} \quad x = \left(\frac{27 \times 16}{3} \right) = 144.$$

$$\text{Birds killed by A} = \frac{5x}{24} = \left(\frac{5}{24} \times 144 \right) = 30.$$

Explanation:

18. In a class, $\frac{3}{5}$ of the students are girls and rest are boys. If $\frac{2}{9}$ of the girls and $\frac{1}{4}$ of the boys are absent, what part of the total number of students is present ?

- A.17/25
B.18/49
C.23/30
D.23/36

Answer & Explanation

Answer: Option C

Explanation:

$$\text{Girls} = \frac{3}{5}, \quad \text{Boys} = \left(1 - \frac{3}{5} \right) = \frac{2}{5}.$$

$$\text{Fraction of students absent} = \frac{2}{9} \text{ of } \frac{3}{5} + \frac{1}{4} \text{ of } \frac{2}{5} = \frac{6}{45} + \frac{1}{10} = \frac{21}{90} = \frac{7}{30}.$$

$$\therefore \text{Fraction of students present} = \left(1 - \frac{7}{30} \right) = \frac{23}{30}.$$

19. In a family, a couple has a son and a daughter. The age of the father is three times that of his daughter and the age of the son is half of that of his mother. The wife is 9 years younger to her husband and the brother is seven years older than his sister. What is the age of the mother ?

- A.40 years
B.45 years
C.50 years
D.60 years

Answer & Explanation

Answer: Option D

Explanation:

Let the daughter's age be x years.

Then, father's age = $(3x)$ years.

Mother's age = $(3x - 9)$ years; Son's age = $(x + 7)$ years.

$$\text{So, } x + 7 = (3x - 9)/2 \quad 2x + 14 = 3x - 9 \quad x = 23.$$

Therefore Mother's age = $(3X - 9) = (69 - 9)$ years = 60 years.

20. If a 1 mm thick paper is folded so that the area is halved at every fold, then what would be the thickness of the pile after 50 folds ?

- A.100 km
B.1000 km
C.1 million km
D.1 billion km

Answer & Explanation

Answer: Option D

Explanation:

Five States Delhi, H.P, U.P, Punjab and Haryana Over the Years 1994 to 1998

Year	Delhi			H.P			U.P			Punjab			Haryana		
	App	Qual	Sel	App	Qual	Sel	App	Qual	Sel	App	Qual	Sel	App	Qual	Sel
1997	8000	850	94	7800	810	82	7500	720	78	8200	680	85	6400	700	75
1998	4800	500	48	7500	800	65	5600	620	85	6800	600	70	7100	650	75
1999	7500	640	82	7400	560	70	4800	400	48	6500	525	65	5200	350	55
2000	9500	850	90	8800	920	86	7000	650	70	7800	720	84	6400	540	60
2001	9000	800	70	7200	850	75	8500	950	80	5700	485	60	4500	600	75

1. For which state the average number of candidates selected over the years is the maximum?

A.Delhi

B.H.P

C.U.P

D.Punjab

Answer & Explanation

Answer: Option A

Explanation:

The average number of candidates selected over the given period for various states are:

$$\text{For Delhi} = \frac{94 + 48 + 82 + 90 + 70}{5} = \frac{384}{5} = 76.8.$$

$$\text{For H.P.} = \frac{82 + 65 + 70 + 86 + 75}{5} = \frac{378}{5} = 75.6.$$

$$\text{For U.P.} = \frac{78 + 85 + 48 + 70 + 80}{5} = \frac{361}{5} = 72.2.$$

$$\text{For Punjab} = \frac{85 + 70 + 65 + 84 + 60}{5} = \frac{364}{5} = 72.8.$$

$$\text{For Haryana} = \frac{75 + 75 + 55 + 60 + 75}{5} = \frac{340}{5} = 68.$$

Clearly, this average is maximum for Delhi.

2. The percentage of candidates qualified from Punjab over those appeared from Punjab is highest in the year?

A.1997

C.1999

Answer & Explanation

Answer: Option D

Explanation:

The percentages of candidates qualified from Punjab over those appeared from Punjab during different years are:

$$\text{For 1997} = \frac{680}{8200} \times 100 \% = 8.29\%.$$

$$\text{For 1998} = \frac{600}{6800} \times 100 \% = 8.82\%.$$

$$\text{For 1999} = \frac{525}{6500} \times 100 \% = 8.08\%.$$

$$\text{For 2000} = \frac{720}{7800} \times 100 \% = 9.23\%.$$

$$\text{For 2001} = \frac{485}{5700} \times 100 \% = 8.51\%.$$

Clearly, this percentage is highest for the year 2000.

3. In the year 1997, which state had the lowest percentage of candidates selected over the candidates appeared?

A.Delhi

B.H.P

C.U.P

D.Punjab

Answer & Explanation

Answer: Option D

Explanation:

The percentages of candidates selected over the candidates appeared in 1997, for various states are:

$$(i) \text{ For Delhi} = \frac{94}{8000} \times 100 \% = 1.175\%.$$

$$(ii) \text{ For H.P.} = \frac{82}{7800} \times 100 \% = 1.051\%.$$

$$(iii) \text{ For U.P.} = \frac{78}{7500} \times 100 \% = 1.040\%.$$

$$(iv) \text{ For Punjab} = \frac{85}{8200} \times 100 \% = 1.037\%.$$

$$(v) \text{ For Haryana} = \frac{75}{6400} \times 100 \% = 1.172\%.$$

Clearly, this percentage is lowest for Punjab.

4. The number of candidates selected from Haryana during the period under review is approximately what percent of the number selected from Delhi during this period?

A.79.5%

B.81%

C.84.5%

Answer & Explanation

Answer: Option D

Explanation:

$$\begin{aligned} \text{Required percentage} &= \frac{(75 + 75 + 55 + 60 + 75)}{(94 + 48 + 82 + 90 + 70)} \times 100 \% \\ &= \frac{340}{384} \times 100 \% \\ &= 88.54\% \end{aligned}$$

88.5%

D.88.5%

$$\begin{aligned} &= \frac{320}{2475} \times 100 \% \\ &= 12.93\% \end{aligned}$$

13%.

5. The percentage of candidates selected from U.P over those qualified from U.P is highest in the year?

A.1997

B.1998

C.1999

D.2001

Answer & Explanation

Answer: Option B

Explanation:

The percentages of candidates selected from U.P. over those qualified from U.P. during different years are:

For 1997 = $\frac{78}{720} \times 100 \% = 10.83\%$.

For 1998 = $\frac{85}{620} \times 100 \% = 13.71\%$.

For 1999 = $\frac{48}{400} \times 100 \% = 12\%$.

For 2000 = $\frac{70}{650} \times 100 \% = 10.77\%$.

For 2001 = $\frac{80}{950} \times 100 \% = 8.42\%$.

Clearly, this percentage is highest for the year 1998.

6.

What is the approximate percentage of total number of candidates selected to the total number of candidates qualified for all five stages together during the year 1999?

A.10%

B.11%

C.12%

D.13%

Answer & Explanation

Answer: Option D

Explanation:

$$\begin{aligned} \text{Required percentage} &= \frac{(82 + 70 + 48 + 65 + 55)}{(640 + 560 + 400 + 525 + 350)} \% \end{aligned}$$

V.The following table gives the sales of batteries manufactured by a company over the years.
Number of Different Types of Batteries Sold by a Company Over the Years (Numbers in Thousands)

Year	Types of Batteries					Total
	4AH	7AH	32AH	35AH	55AH	
1992	75	144	114	102	108	543
1993	90	126	102	84	126	528
1994	96	114	75	105	135	525
1995	105	90	150	90	75	510
1996	90	75	135	75	90	465
1997	105	60	165	45	120	495
1998	115	85	160	100	145	605

1. What was the approximate percentage increase in the sales of 55AH batteries in 1998 compared to that in 1992?

A.28%

B.31%

C.33%

D.34%

Answer & Explanation

Answer: Option D

Explanation:

$$\begin{aligned} \text{Required percentage} &= \frac{(145 - 108)}{108} \times 100 \% \\ &= 34.26\% \end{aligned}$$

34%.

2. The total sales of all the seven years is the maximum for which battery?

- A.4AH
C.32AH

Answer & Explanation

Answer: Option C

Explanation:

The total sales (in thousands) of all the seven years for various batteries are:

$$\text{For } 4\text{AH} = 75 + 90 + 96 + 105 + 90 + 105 + 115 = 676$$

$$\text{For } 7\text{AH} = 144 + 126 + 114 + 90 + 75 + 60 + 85 = 694$$

$$\text{For } 32\text{AH} = 114 + 102 + 75 + 150 + 135 + 165 + 160 = 901$$

$$\text{For } 35\text{AH} = 102 + 84 + 105 + 90 + 75 + 45 + 100 = 601$$

$$\text{For } 55\text{AH} = 108 + 126 + 135 + 75 + 90 + 120 + 145 = 799.$$

Clearly, sales are maximum in case of 32AH batteries.

- B.7AH
D.35AH

Clearly, the percentage is maximum in 1997.

5. In case of which battery there was a continuous decrease in sales from 1992 to 1997?

- A.4AH
C.32AH

- B.7AH
D.35AH

Answer & Explanation

Answer: Option B

Explanation:

From the table it is clear that the sales of 7AH batteries have been decreasing continuously from 1992 to 1997.

- VI.A school has four sections A, B, C, D of Class IX students.

The results of half yearly and annual examinations are shown in the table given below.

Result	No. of Students			
	Section A	Section B	Section C	Section D
Students failed in both Exams	28	23	17	27
Students failed in half-yearly but passed in Annual Exams	14	12	8	13
Students passed in half-yearly but failed in Annual Exams	6	17	9	15
Students passed in both Exams	64	55	46	76

1. If the number of students passing an examination be considered a criteria for comparision of difficulty level of two examinations, which of the following statements is true in this context?
A.Half yearly examinations were more difficult.
B.Annual examinations were more difficult.
C.Both the examinations had almost the same difficulty level.

3. What is the difference in the number of 35AH batteries sold in 1993 and 1997?

- A.24000
C.35000

- B.28000
D.39000

Answer & Explanation

Answer: Option D

Explanation:

Required difference = $[(84 - 45) \times 1000] = 39000$.

4. The percentage of 4AH batteries sold to the total number of batteries sold was maximum in the year?

- A.1994
C.1996

- B.1995
D.1997

Answer & Explanation

Answer: Option D

Explanation:

The percentages of sales of 4AH batteries to the total sales in different years are:

$$\text{For 1992} = \frac{75}{543} \times 100 \% = 13.81\%$$

$$\text{For 1993} = \frac{90}{528} \times 100 \% = 17.05\%$$

$$\text{For 1994} = \frac{96}{525} \times 100 \% = 18.29\%$$

$$\text{For 1995} = \frac{105}{510} \times 100 \% = 20.59\%$$

$$\text{For 1996} = \frac{96}{465} \times 100 \% = 19.35\%$$

$$\text{For 1997} = \frac{105}{495} \times 100 \% = 21.21\%$$

$$\text{For 1998} = \frac{115}{605} \times 100 \% = 19.01\%$$

Let the female population below poverty line be x million.

$$5 : 2.4 = x : 3$$

Then, $3 : 5 = 2.4 : x$

$$x = \frac{3}{2.4} = 4.$$

Total population below poverty line = $(2.4 + 4) = 6.4$ million.

If N_q be the total population of State Q, then,

$$\frac{6.4 \times 100}{25} \text{ million} = 25.6 \text{ million.}$$

25% of $N_q = 6.4$ million

$$N_q = \frac{25}{6.4} \times 100 = 38.75 \text{ million.}$$

For State T:

Male population below poverty line = 6 million.

Let the female population below poverty line be y million.

$$\frac{3 \times 6}{y} = 3.6$$

Then, $5 : 3 = 6 : y$

$$y = \frac{5}{3} \times 6 = 10 \text{ million.}$$

Total population below poverty line = $(6 + 10) = 16$ million.

If N_t be the total population of State T, then,

$$\frac{9.6 \times 100}{15} \text{ million} = 64 \text{ million.}$$

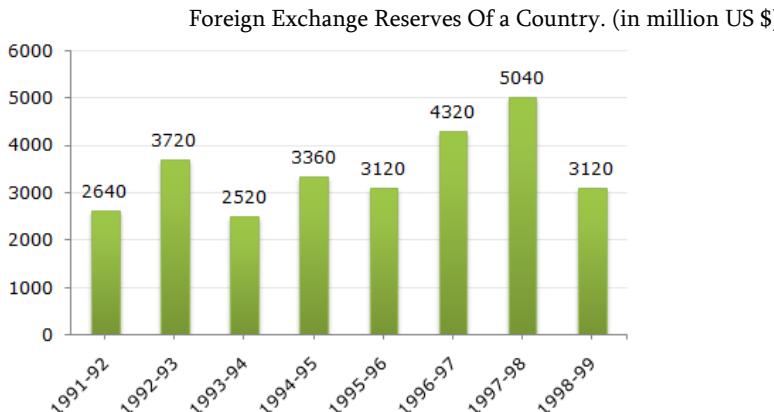
15% of $N_t = 9.6$ million

$$N_t = \frac{15}{9.6} \times 100 = 15.625 \text{ million.}$$

$$\text{Thus, Required ratio} = \frac{N_q}{N_t} = \frac{38.75}{15.625} = \frac{2}{5}.$$

BAR CHARTS

- I. The bar graph given below shows the foreign exchange reserves of a country (in million US \$) from 1991 - 1992 to 1998 - 1999.



1. The ratio of the number of years, in which the foreign exchange reserves are above the average reserves, to those in which the reserves are below the average reserves is?

- A. 2:6
B. 3:4
C. 3:5
D. 4:4

Answer & Explanation

Answer: Option C

Explanation:

Average foreign exchange reserves over the given period = 3480 million US \$.

The country had reserves above 3480 million US \$ during the years 1992-93, 1996-97 and 1997-98, i.e., for 3 years and below 3480 million US \$ during the years 1991-92, 1993-94, 1994-95, 1995-96 and 1998-99 i.e., for 5 years.

Hence, required ratio = 3 : 5.

2. The foreign exchange reserves in 1997-98 was how many times that in 1994-95?

- A. 0.7
B. 1.2
C. 1.4
D. 1.5

Answer & Explanation

Answer: Option D

Explanation:

$$\text{Required ratio} = \frac{5040}{3360} = 1.5.$$

3. For which year, the percent increase of foreign exchange reserves over the previous year, is the highest?

- A. 1992-93
B. 1993-94
C. 1994-95
D. 1996-97

Answer & Explanation

Answer: Option A

Explanation:

There is an increase in foreign exchange reserves during the years 1992 - 1993, 1994 - 1995, 1996 - 1997, 1997 - 1998 as compared to previous year (as shown by bar-graph).

The percentage increase in reserves during these years compared to previous year are:

$$\begin{aligned} \text{For 1992 - 1993} &= \frac{(3720 - 2640)}{2640} \times 100 \% = 40.91\%. \\ \text{For 1994 - 1995} &= \frac{(3360 - 2520)}{2520} \times 100 \% = 33.33\%. \\ \text{For 1996 - 1997} &= \frac{(4320 - 3120)}{3120} \times 100 \% = 38.46\%. \\ \text{For 1997 - 1998} &= \frac{(5040 - 4320)}{4320} \times 100 \% = 16.67\%. \end{aligned}$$

Clearly, the percentage increase over previous year is highest for 1992 - 1993.

4. The foreign exchange reserves in 1996-97 were approximately what percent of the average foreign exchange reserves over the period under review?

- A. 95%
B. 110%
C. 115%
D. 125%

Answer & Explanation

A.27 C.18 Answer & Explanation Answer: Option B Explanation: Let the total expenditures be Rs. x . Then, the expenditure on Research and Development (R & D) = Rs. (5% of x) = Rs. $\frac{5}{100}x$ = Rs. $\frac{x}{20}$	B.20 D.8 Answer & Explanation Answer: Option D Explanation: Let the total amount of expenditures be Rs. x . Then, the total expenditure on infrastructure and transport = Rs. [(20 + 12.5)% of x] = Rs. [32.5% of x] = Rs. $\frac{32.5x}{100}$	A.5:4 C.9:7 Answer & Explanation Answer: Option D Explanation: Let the total amount of expenditures be Rs. x . Then, the total expenditure on infrastructure and transport = Rs. [(20 + 12.5)% of x] = Rs. [32.5% of x] = Rs. $\frac{32.5x}{100}$ and total expenditure on taxes and interest on loans = Rs. [(10 + 17.5)% of x] = Rs. [27.5% of x] = Rs. $\frac{27.5x}{100}$ Required ratio = $\frac{32.5x/100}{27.5x/100} = \frac{13}{11}$
Ratio of the total expenditure to the expenditure on R & D = $\frac{x}{x/20}$ = $\frac{20}{1}$		
Then, the total expenditure is 20 times the expenditure of Research and Development.		
2. If the expenditure on advertisement is 2.10 crores then the difference between the expenditure on transport and taxes is? A.Rs. 1.25 crores B.Rs. 95 lakhs C.Rs. 65 lakhs D.Rs. 35 lakhs		4. If the interest on loans amounted to Rs. 2.45 crores then the total amount of expenditure on advertisement, taxes and research and development is? A.Rs. 7 crores B.Rs. 5.4 crores C.Rs. 4.2 crores D.Rs. 3 crores
Answer & Explanation Answer: Option D Explanation: Let the total expenditure be Rs. x crores.		Answer & Explanation Answer: Option C Explanation: Let the total expenditure be Rs. x crores.
Then, 15% of x = 2.10 $\frac{2.10 \times 100}{15} = 14.$		Then, 17.5% of x = 2.45 $\frac{2.45}{17.5\%} = 14.$
Total expenditure = Rs. 14 crores and so, the difference between the expenditures on transport and taxes = Rs. [(12.5 - 10)% of 14] crores = Rs. [2.5% of 14] crores = Rs. 0.35 crores = Rs. 35 lakhs		Total expenditure = Rs. 14 crores. and so, the total expenditure on advertisement, taxes and Research and Development = Rs. [(15 + 10 + 5)% of 14] crores = Rs. [30% of 14] crores = Rs. 4.2 crores.
3. What is the ratio of the total expenditure on infrastructure and transport to the total expenditure on taxes and interest on loans?		5. The expenditure on the interest on loans is by what percent more than the expenditure on transport? A.5% B.10% C.20% D.40%
		Answer & Explanation

Answer: Option D

Explanation:

Let the total amount of expenditures be Rs. x .

Then, the expenditure on interest on loans = Rs. (17.5% of x) = Rs. $\frac{17.5}{100}x$

and the expenditure on transport = Rs. (12.5% of x) = Rs. $\frac{12.5}{100}x$

$$\begin{aligned}\text{Difference between the two expenditures} &= \text{Rs. } \frac{17.5x - 12.5x}{100} \\ &= \text{Rs. } \frac{5x}{100}\end{aligned}$$

and so, the required percentage = $\frac{5x/100}{12.5x/100} \times 100\% = 40\%$.

$(40+10) = 50\%$ (from first chart)

2. The ratio of the number of Indian tourists that went to USA to the number of Indian tourists who were below 30 years of age is ?

A.2:1

C.3:8

B.8:3

D.Cannot be determined

Answer & Explanation

Answer: Option B

Explanation:

$40:15 = 8:3$

3. If amongst other countries, Switzerland accounted for 25% of the Indian tourist traffic, and it is known from official Swiss records that a total of 25 lakh Indian tourists had gone to Switzerland during the year, then find the number of 30-39 year old Indian tourists who went abroad in that year ?

A.18.75 lakh

B.25 lakh

C.50 lakh

D.75 lakh

Answer & Explanation

Answer: Option D

Explanation:

Tourist traffic from other countries to Swiz is 20%.

Amongst this 20%, 25% of traffic from India.

So, $25\% \text{ of } 20\% = 5\%$ corresponds to the Indian traffic in Switzerland.

5 % corresponds to Switzerland's 25 lakh. Hence 15% will be 75 lakh.

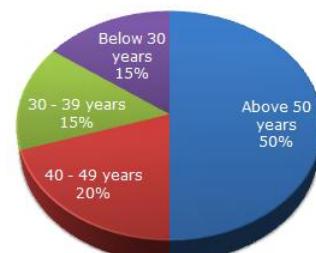
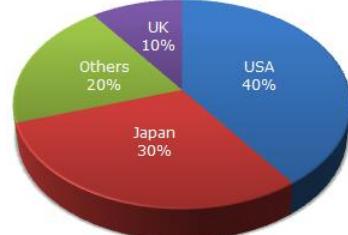
- II.The following pie chart give the information about the distribution of weight in the human body according to different kinds of components. Study the pie charts and answer the question.

Distribution of Weight in Human Body

PIE CHARTS

I.The following pie charts exhibit the distribution of the overseas tourist traffic from India. The two charts shows the tourist distribution by country and the age profiles of the tourists respectively.

Distribution of Overseas Tourist Traffic from India.



1. What percentage of Indian tourist went to either USA or UK ?

A.40 %

B.50 %

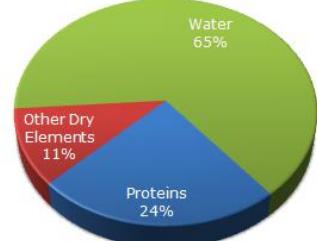
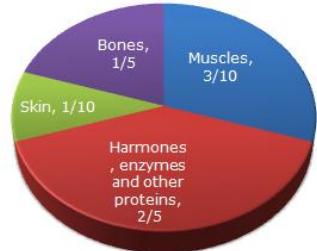
C.60 %

D.70 %

Answer & Explanation

Answer: Option B

Explanation:



1. What percentage of proteins of the human body is equivalent to the weight of its skin ?

- A.41.66 %
- B. 43.33 %
- C.44.44 %
- D.Cannot be determined

Answer & Explanation

Answer: Option A

Explanation:

$$\text{Total percentage} = (10 / 24) \times 100 = 41.666667 \%$$

2. How much of the human body is neither made of bones or skin ?

- A.40 %
- B.50 %
- C.60 %
- D.70 %

Answer & Explanation

Answer: Option D

Explanation:

$20 + 10 = 30\%$ is made up of either bones or skin. Hence, 70% is made up of neither.

3. What is the ratio of the distribution of proteins in the muscles to that of the distribution of proteins in the bones ?

- A.2:1
- B. 2:3
- C.3:2
- D.Cannot be determined

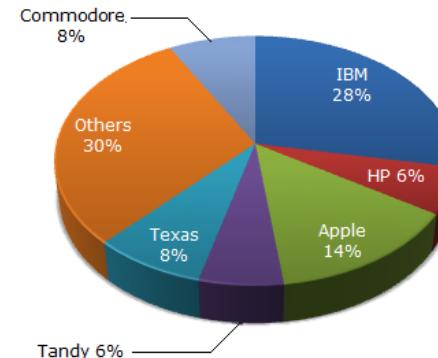
Answer & Explanation

Answer: Option D

Explanation:

It cannot be determined since the respective distributions are not known.

III.The pie chart shows the distribution of New York market share by **value** of different computer companies in 2005.



The pie chart shows the distribution of New York market share by **volume** of different computer companies in 2005.

Number of units sold in 2005 in New York = 1,500

Value of units sold in 2005 in New York = US \$1,650,000.

1. For the year 2005, which company has realised the lowest average unit sales price for a PC ?

- A.Commodore
- B.IBM
- C.Tandy
- D.Cannot be determined

Answer & Explanation

Answer: Option D

Explanation:

Although it seems to be Commodore, the answer cannot be determined due to the fact that we are unaware of the break-up of the sales value and volume of companies compromising the other categories.

2. Over the period 2005-2006, if sales (value-wise) of IBM PC's increased by 50% and of Apple by 15% assuming that PC sales of all other computer companies remained the same, by what percentage (approximately) would the PC sales in New York (value-wise) increase over the same period ?

- A.16.1 %
- B.18 %
- C.14 %
- D.None of these

Answer & Explanation

Answer: Option A

Explanation:

If we assume the total sales to be 100 in the first year, IBM's sales would go up by 50% (from 28 to 42) contributing an increase of 14 to the total sales value.

5. In how many of the given years were the exports more than the imports ?

- | | |
|-----|-----|
| A.1 | B.2 |
| C.3 | D.4 |

Answer & Explanation

Answer: Option D

Explanation:

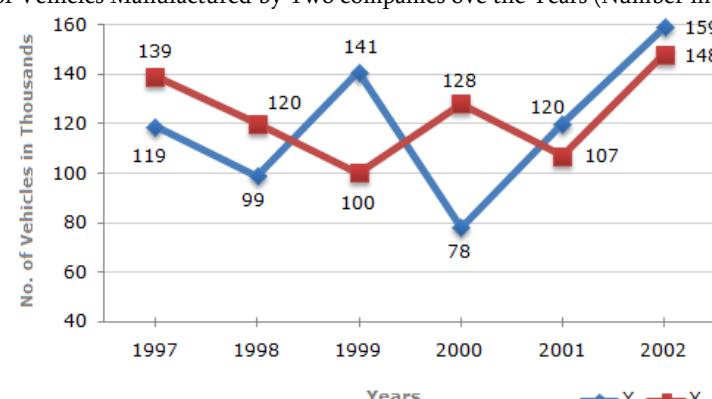
The exports are more than the imports imply that the ratio of value of imports to exports is less than 1.

Now, this ratio is less than 1 in years 1995, 1996, 1997 and 2000.

Thus, there are four such years.

II. Study the following line graph and answer the questions based on it.

Number of Vehicles Manufactured by Two companies over the Years (Number in Thousands)



1. What is the difference between the number of vehicles manufactured by Company Y in 2000 and 2001 ?

- | | |
|---------|---------|
| A.50000 | B.42000 |
| C.33000 | D.21000 |

Answer & Explanation

Answer: Option D

Explanation:

Required difference = $(128000 - 107000) = 21000$.

2. What is the difference between the total productions of the two Companies in the given years ?

- | | |
|---------|---------|
| A.19000 | B.22000 |
| C.26000 | D.28000 |

Answer & Explanation

Answer: Option C

Explanation:

From the line-graph it is clear that the productions of Company X in the years 1997, 1998, 1999, 2000, 2001 and 2002 are 119000, 99000, 141000, 78000, 120000 and 159000 and those of Company Y are 139000, 120000, 100000, 128000, 107000 and 148000 respectively.

Total production of Company X from 1997 to 2002

$$= 119000 + 99000 + 141000 + 78000 + 120000 + 159000$$

$$= 716000.$$

and total production of Company Y from 1997 to 2002

$$= 139000 + 120000 + 100000 + 128000 + 107000 + 148000$$

$$= 742000.$$

$$\text{Difference} = (742000 - 716000) = 26000.$$

3. What is the average numbers of vehicles manufactured by Company X over the given period ? (rounded off to nearest integer)

- | | |
|----------|----------|
| A.119333 | B.113666 |
| C.112778 | D.111223 |

Answer & Explanation

Answer: Option A

Explanation:

Average number of vehicles manufactured by Company X

$$\frac{1}{6} \times (119000 + 99000 + 141000 + 78000 + 120000 + 159000) \\ = 119333.$$

4. In which of the following years, the difference between the productions of Companies X and Y was the maximum among the given years ?

- | | |
|--------|--------|
| A.1997 | B.1998 |
| C.1999 | D.2000 |

Answer & Explanation

Answer: Option D

Explanation:

The difference between the productions of Companies X and Y in various years are:

For 1997 $(139000 - 119000) = 20000$.

For 1998 $(120000 - 99000) = 21000$.

For 1999 $(141000 - 100000) = 41000$.

For 2000 $(128000 - 78000) = 50000$.

For 2001 $(120000 - 107000) = 13000$.

For 2002 $(159000 - 148000) = 11000$.

Clearly, maximum difference was in 2000.

Total expenditure of Companies X and Y in 1996 = $2x$ = Rs. 240 crores.

Total income of Companies X and Y in 1996 = Rs. 342 crores.

Total profit = Rs. (342 - 240) crores = Rs. 102 crores.

4. The expenditure of Company X in the year 1998 was Rs. 200 crores and the income of company X in 1998 was the same as its expenditure in 2001. The income of Company X in 2001 was ?

- A.Rs. 465 crores B. Rs. 385 crores
C.Rs. 335 crores D.Rs. 295 crores

Answer & Explanation

Answer: Option A

Explanation:

Let the income of Company X in 1998 be Rs. x crores.

$$\text{Then, } 55 = \frac{x - 200}{200} \times 100 \quad x = 310.$$

$$\begin{aligned} \text{Expenditure of Company X in 2001} &= \text{Income of Company X in 1998} \\ &= \text{Rs. } 310 \text{ crores.} \end{aligned}$$

Let the income of Company X in 2001 be Rs. z crores.

$$\text{Then, } 50 = \frac{z - 310}{310} \times 100 \quad z = 465.$$

Income of Company X in 2001 = Rs. 465 crores.

5. If the incomes of two Companys were equal in 1999, then what was the ratio of expenditure of Company X to that of Company Y in 1999 ?

- A.6:5 B.5:6
C.11:6 D.16:15

Answer & Explanation

Answer: Option D

Explanation:

Let the incomes of each of the two Companies X and Y in 1999 be Rs. x .

And let the expenditures of Companies X and Y in 1999 be E_1 and E_2 respectively.

Then, for Company X we have:

$$50 = \frac{x - E_1}{E_1} \times 100 \quad 100 = \frac{50}{E_1} \quad E_1 = 100 \quad \text{..... (i)}$$

Also, for Company Y we have:

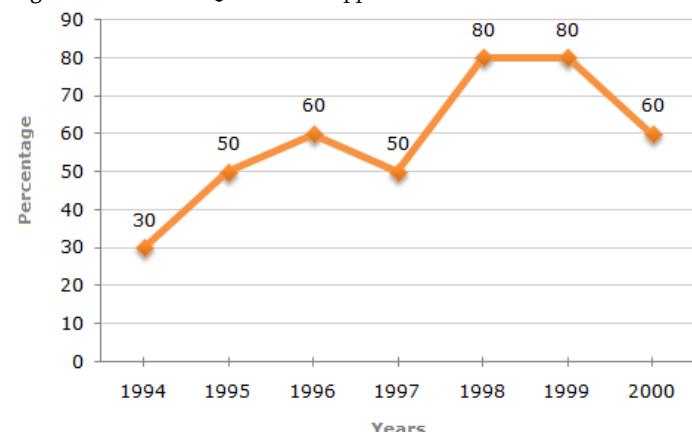
$$60 = \frac{x - E_2}{E_2} \times 100 \quad 100 = \frac{60}{E_2} \quad E_2 = 100 \quad \text{..... (ii)}$$

From (i) and (ii), we get:

$$\frac{150}{100} = \frac{160}{100} \quad \frac{E_1}{E_2} = \frac{16}{15} \quad (\text{Required ratio}).$$

- IV.The following line graph gives the percentage of the number of candidates who qualified an examination out of the total number of candidates who appeared for the examination over a period of seven years from 1994 to 2000.

Percentage of Candidates Qualified to Appeared in an Examination Over the Years



1. The difference between the percentage of candidates qualified to appeared was maximum in which of the following pairs of years?

- A.1994 and 1995 B.1997 and 1998
C.1998 and 1999 D.1999 and 2000

Answer & Explanation

Answer: Option B

Explanation:

The differences between the percentages of candidates qualified to appeared for the give pairs of years are:

For 1994 and 1995 = $50 - 30 = 20$.

For 1998 and 1999 = $80 - 80 = 0$.

For 1994 and 1997 = $50 - 30 = 20$.

For 1997 and 1998 = $80 - 50 = 30$.

For 1999 and 2000 = $80 - 60 = 20$.

Thus, the maximum difference is between the years 1997 and 1998.

2. In which pair of years was the number of candidates qualified, the same?

- A.1995 and 1997 B.1995 and 2000

C.1998 and 1999

Answer & Explanation

Answer: Option D

Explanation:

The graph gives the data for the percentage of candidates qualified to appeared and unless the absolute values of number of candidates qualified or candidates appeared is known we cannot compare the absolute values for any two years.

Hence, the data is inadequate to solve this question.

D.Data inadequate

3. If the number of candidates qualified in 1998 was 21200, what was the number of candidates appeared in 1998?

A.32000

B.28500

C.26500

D.25000

Answer & Explanation

Answer: Option C

Explanation:

The number of candidates appeared in 1998 be x .

$$\frac{21200 \times 100}{x} = 26500 \text{ (required number).}$$

Then, 80% of $x = 21200$

$x = 80$

4. If the total number of candidates appeared in 1996 and 1997 together was 47400, then the total number of candidates qualified in these two years together was?

A.34700

B.32100

C.31500

D.Data inadequate

Answer & Explanation

Answer: Option D

Explanation:

The total number of candidates qualified in 1996 and 1997 together, cannot be determined until we know at least, the number of candidates appeared in any one of the two years 1996 or 1997 or the percentage of candidates qualified to appeared in 1996 and 1997 together.

Hence, the data is inadequate.

5. The total number of candidates qualified in 1999 and 2000 together was 33500 and the number of candidates appeared in 1999 was 26500. What was the number of candidates in 2000?

A.24500

B.22000

C.20500

D.19000

Answer & Explanation

Answer: Option C

Explanation:

The number of candidates qualified in 1999 = (80% of 26500) = 21200.

Number of candidates qualified in 2000 = (33500 - 21200) = 12300.

Let the number of candidates appeared in 2000 be x .

$$\begin{aligned} 12300 \times 100 \\ \text{Then, } 60\% \text{ of } x = 12300 \quad x = 60 \\ = 20500. \end{aligned}$$

DATA SUFFICIENCY (DS) PROBLEMS ON TRAINS

1. What is the speed of the train whose length is 210 metres?

I. The train crosses another train (Howrah Express/12869) of 300 metres length running in opposite direction in 10 seconds.

II. The train crosses another train (Howrah Express/12869) running in the same direction at the speed of 60 km/hr in 30 seconds.

A.I alone sufficient while II alone not sufficient to answer

B.II alone sufficient while I alone not sufficient to answer

C.Either I or II alone sufficient to answer

D.Both I and II are not sufficient to answer

E. Both I and II are necessary to answer

Answer & Explanation

Answer: Option E

Explanation:

Time taken to cross the train, $\frac{(l + b)}{(u + v)}$ sec.

$$(210 + 300)$$

$$10 = (u + v)$$

$$u + v = 51.$$

Time taken to cross the train, running in same direction $= \frac{(l + b)}{(u - v)}$ sec.

$$(210 + 300)$$

$$30 = (u - 60 \times (5/18))$$

$$u = \frac{50}{17 + \frac{3}{3}} \text{ m/sec.}$$

Thus, u and v can be obtained.

Correct answer is (E).

2. What is the length of a running train crossing another 180 metre long train running in the opposite direction?

- I. The relative speed of the two trains was 150 kmph.
 II. The trains took 9 seconds to cross each other.
 A.I alone sufficient while II alone not sufficient to answer
 B. II alone sufficient while I alone not sufficient to answer
 C.Either I or II alone sufficient to answer
 D.Both I and II are not sufficient to answer
 E. Both I and II are necessary to answer

Answer & Explanation

Answer: Option E

Explanation:

Let the two trains of length a metres and b metres be moving in opposite directions at u m/s and v m/s.

$$\text{Time taken to cross each other} = \frac{(a + b)}{(u + v)} \text{ sec.}$$

$$\text{Now, } b = 180, u + v = \frac{5}{18} \text{ m/sec.} \quad \frac{125}{3} \text{ m/sec.}$$

$$a + 180 \\ 9 = (125/3)$$

$$a = (375 - 180) = 195 \text{ m.}$$

3. What is the length of a running train?

- I. The train crosses a man in 9 seconds.
 II. The train crosses a 240 metre long platform in 24 seconds.
 A.I alone sufficient while II alone not sufficient to answer
 B. II alone sufficient while I alone not sufficient to answer
 C.Either I or II alone sufficient to answer
 D.Both I and II are not sufficient to answer
 E. Both I and II are necessary to answer

Answer & Explanation

Answer: Option E

Explanation:

$$\text{Time taken by train to cross a min} = \frac{\text{Length of train}}{\text{Speed of train}} \quad \frac{l}{9} \dots (i)$$

$$\text{Time taken by train to cross a platform} = \frac{(\text{Length of train} + \text{Length of platform})}{\text{Speed of train}} \quad \frac{l + 240}{24} \dots (ii)$$

$$\text{From (i) and (ii), we get } \frac{l}{9} = \frac{l + 240}{24}.$$

Thus, l can be obtained. So both I and II are necessary to get the answer.

The correct answer is (E).

4. What is the speed of the train?

- I. The train crosses a signal pole in 18 seconds.
 II. The train crosses a platform of equal length in 36 seconds.
 III. Length of the train is 330 metres.

- A.I and II only
 B. II and III only
 C.I and III only
 D.III and either I or II only
 E. Any two of the three

Answer & Explanation

Answer: Option D

Explanation:

Let the speed of the train be x metres/sec.

$$\text{Time taken to cross a signal pole} = \frac{\text{Length of the train}}{\text{Speed of the train}}$$

$$\text{Time taken to cross a platform} = \frac{(\text{Length of the train} + \text{Length of the Platform})}{\text{Speed of the train}}$$

Length of train = 330 m.

$$\text{I and III give, } 18 = \frac{330}{x} \quad \frac{330}{x} = 18 \text{ m/sec} = \frac{55}{3} \text{ m/sec.}$$

$$\text{II and III give, } 36 = \frac{2 \times 330}{x} \quad \frac{660}{x} = 36 \text{ m/sec} = \frac{55}{3} \text{ m/sec.}$$

Correct answer is (D).

5. What is the speed of the train?

- I. The train crosses a tree in 13 seconds.
 II. The train crosses a platform of length 250 metres in 27 seconds.
 III. The train crosses another train running in the same direction in 32 seconds.

- A.I and II only
 B. II and III only
 C.I and III only
 D.Any two of the three
 E. None of these

Answer & Explanation

Answer: Option A

Explanation:

Let the speed of the train be x metres/sec.

$$\text{Time taken to cross a tree} = \frac{\text{Length of the train}}{\text{Speed of the train}}$$

$$\text{Time taken to cross a platform} = (\text{Length of the train} + \text{Length of the Platform})$$

Speed of the train

$$\text{I gives, } 13 = \frac{I}{x} = 13x.$$

$$\text{II gives } 27 = \frac{I+250}{x}$$

$$13x + 250 = 27 \\ x \\ 125 \\ x = 7 \text{ m/sec.}$$

Thus I and II give the speed of the train.

The correct answer is (A.)

At what time will the train reach city X from city Y?

- I. The train crosses another train of equal length of 200 metres and running in opposite directions in 15 seconds.
 - II. The train leaves city Y at 7.15 a.m. for city X situated at a distance of 558 km.
 - III. The 200 metres long train crosses a signal pole in 10 seconds.
- A.I only
B.II only
C.III only
D.II and III only
E.All I, II and III are required.

Answer & Explanation

Answer: Option D

Explanation:

6.From the statement I, we get length of the train is 200 metres (Redundant info while comparing with Statement III). The rest of the info given in this statement cannot be used for calculating the speed of the train, because the two trains might run at different speed.

$$\text{III gives, speed} = \frac{200}{10} \text{ m/sec} = 20 \text{ m/sec} = \frac{20 \times 18}{5} \text{ km/hr} = 72 \text{ km/hr.}$$

$$\text{II gives, time taken} = \frac{558}{72} \text{ hrs} = \frac{31}{4} \text{ hrs} = \frac{3}{7} \text{ hrs} = 7 \text{ hrs } 45 \text{ min.}$$

So, the train will reach city X at 3 p.m.

Hence II and III only gives the answer.

7. What is the length of a running train P crossing another running train Q?

- I. These two trains take 18 seconds to cross each other.
 - II. These trains are running in opposite directions.
 - III. The length of the train Q is 180 metres.
- A.I only
B.II only
C.III only

D.All I, II and III are required

E. Even with I, II and III, the answer cannot be obtained.

Answer & Explanation

Answer: Option E

Explanation:

Let the length of the train P be x metres.

II. These trains are running in opposite directions.

III. Length of the train Q is 180 m.

$$\text{I. Time taken by P to cross Q} = \frac{(180+x)}{\text{Relative speed}} \quad (180+x) \\ 18 = \text{Relative speed}$$

Thus, even with I, II and III, the answer cannot be obtained.

Correct answer is (E).

TIME AND DISTANCE

1. Two towns are connected by railway. Can you find the distance between them?

- I. The speed of the mail train is 12 km/hr more than that of an express train.
- II. A mail train takes 40 minutes less than an express train to cover the distance.
- A.I alone sufficient while II alone not sufficient to answer
- B.II alone sufficient while I alone not sufficient to answer
- C.Either I or II alone sufficient to answer
- D.Both I and II are not sufficient to answer
- E. Both I and II are necessary to answer

Answer & Explanation

Answer: Option D

Explanation:

Let the distance between the two stations be x km.

I. Then, speed of the mail train = $(y + 12)$ km/hr.

$$\text{II. } \frac{x}{y} - \frac{x}{(y+12)} = \frac{40}{60}$$

Thus, even I and II together do not give x .

Correct answer is (D).

2. The towns A, B and C are on a straight line. Town C is between A and B. The distance from A to B is 100 km. How far is A from C?

- I. The distance from A to B is 25% more than the distance from C to B.
- II. The distance from A to C is $(1/4)$ of the distance C to B.
- A.I alone sufficient while II alone not sufficient to answer
- B.II alone sufficient while I alone not sufficient to answer
- C.Either I or II alone sufficient to answer

D. Both I and II are not sufficient to answer

E. Both I and II are necessary to answer

Answer & Explanation

Answer: Option C

Explanation:

$$\text{A} \quad x \quad \text{C} \quad (100 - x) \quad \text{B}$$

Let AC = x km. Then, CB = $(100 - x)$ km.

I. AB = 125% of CB

$$100 = 100 \times (100 - x)$$
$$100 \times 100 = 125$$
$$100 - x = 80$$

$$x = 20 \text{ km.}$$

$$AC = 20 \text{ km.}$$

Thus, I alone gives the answer.

II. $AC = \frac{1}{4}CB$

$$\frac{1}{4}(100 - x)$$

$$x = 100$$

$$x = 20.$$

$$AC = 20 \text{ km.}$$

Thus, II alone gives the answer.

Correct answer is (C).

3. Two cars pass each other in opposite direction. How long would they take to be 500 km apart?

I. The sum of their speeds is 135 km/hr.

II. The difference of their speed is 25 km/hr.

A.I alone sufficient while II alone not sufficient to answer

B. II alone sufficient while I alone not sufficient to answer

C. Either I or II alone sufficient to answer

D. Both I and II are not sufficient to answer

E. Both I and II are necessary to answer

Answer & Explanation

Answer: Option A

Explanation:

I gives, relative speed = 135 km/hr.

$$\frac{500}{135} \text{ hrs.}$$

II does not give the relative speed.

I alone gives the answer and II is irrelevant.

Correct answer is (A).

4. How much time did X take to reach the destination?

I. The ratio between the speed of X and Y is 3 : 4.

II. Y takes 36 minutes to reach the same destination.

A.I alone sufficient while II alone not sufficient to answer

B. II alone sufficient while I alone not sufficient to answer

C. Either I or II alone sufficient to answer

D. Both I and II are not sufficient to answer

E. Both I and II are necessary to answer

Answer & Explanation

Answer: Option E

Explanation:

Since ratio of speed of X : Y is 3 : 4, then ratio of time will be 4 : 3.

I. If Y takes 3 min, then X takes 4 min.

II. If Y takes 36 min, then X takes $\frac{4}{3} \times 36 = 48$ min.

Thus, I and II together give the answer.

Correct answer is (E).

TIME AND WORK

1. A and B together can complete a task in 7 days. B alone can do it in 20 days. What part of the work was carried out by A?

I. A completed the job alone after A and B worked together for 5 days.

II. Part of the work done by A could have been done by B and C together in 6 days.

A.I alone sufficient while II alone not sufficient to answer

B. II alone sufficient while I alone not sufficient to answer

- C. Either I or II alone sufficient to answer
 D. Both I and II are not sufficient to answer
 E. Both I and II are necessary to answer

Answer & Explanation

Answer: Option A

Explanation:

$$B's \text{ 1 day's work} = \frac{1}{20}$$

$$(A+B)'s \text{ 1 day's work} = \frac{1}{7}$$

$$\text{I. } (A+B)'s \text{ 5 day's work} = \frac{5}{7}$$

$$\text{Remaining work} = 1 - \frac{5}{7} = \frac{2}{7}$$

$\frac{2}{7}$ work was carried by A.

II. is irrelevant.

Correct answer is (A).

2. How long will Machine Y, working alone, take to produce x candles?

- I. Machine X produces x candles in 5 minutes.
 II. Machine X and Machine Y working at the same time produce x candles in 2 minutes.
 A. I alone sufficient while II alone not sufficient to answer
 B. II alone sufficient while I alone not sufficient to answer
 C. Either I or II alone sufficient to answer
 D. Both I and II are not sufficient to answer
 E. Both I and II are necessary to answer

Answer & Explanation

Answer: Option E

Explanation:

I. gives, Machine X produces $\frac{x}{5}$ candles in 1 min.

II. gives, Machine X and Y produce $\frac{x}{2}$ candles in 1 min.

From I and II, Y produces $\frac{x}{2} - \frac{x}{5} = \frac{3x}{10}$ candles in 1 min.

$\frac{3x}{10}$ candles are produced by Y in 1 min.

x candles will be produced by Y in $\frac{10}{3x} \times x = \frac{10}{3}$ min.

Thus, I and II both are necessary to get the answer.

Correct answer is (E).

3. In how many days can 10 women finish a work?

I. 10 men can complete the work in 6 days.

II. 10 men and 10 women together can complete the work in $3\frac{3}{7}$ days

III. If 10 men work for 3 days and thereafter 10 women replace them, the remaining work is completed in 4 days.

A. Any two of the three

B. I and II only

C. II and III only

D. I and III only

E. None of these

Answer & Explanation

Answer: Option A

Explanation:

I. (10×6) men can complete the work in 1 day.

$$1 \text{ man's 1 day's work} = 60$$

II. $10 \times \frac{24}{7}$ men + $10 \times \frac{24}{7}$ women can complete the work in 1 day.

$$\frac{240}{7} \text{ men's 1 day work} + \frac{240}{7} \text{ women's 1 day work} = 1.$$

$$\frac{240}{7} \times \frac{1}{60} + \frac{240}{7} \text{ women's 1 day's work} = 1.$$

$$\frac{240}{7} \text{ women's 1 day's work} = 1 - \frac{4}{7} = \frac{3}{7}$$

$$10 \text{ women's 1 day's work} = \frac{3}{7} \times \frac{240}{7} \times \frac{10}{10} = \frac{1}{8}$$

So, 10 women can finish the work in 8 days.

III. $(10 \text{ men's work for 3 days}) + (10 \text{ women's work for 4 days}) = 1$

$$(10 \times 3) \text{ men's 1 day's work} + (10 \times 4) \text{ women's 1 day's work} = 1$$

$$30 \text{ men's 1 day's work} + 40 \text{ women's 1 day's work} = 1$$

Thus, I and III will give us the answer.

And, II and III will give us the answer.

Correct answer is (A).

4. How many workers are required for completing the construction work in 10 days?

- I. 20% of the work can be completed by 8 workers in 8 days.
- II. 20 workers can complete the work in 16 days.
- III. One-eighth of the work can be completed by 8 workers in 5 days.

- A.I only
- B.II and III only
- C.III only
- D.I and III only
- E. Any one of the three

Answer & Explanation

Answer: Option E

Explanation:

$$\text{I. } \frac{20}{100} \text{ work can be completed by } (8 \times 8) \text{ workers in 1 day.}$$

Whole work can be completed by $(8 \times 8 \times 5)$ workers in 1 day.

$$\text{II. } \frac{8 \times 8 \times 5}{10} \text{ workers in 10 days} = 32 \text{ workers in 10 days.}$$

II. (20×16) workers can finish it in 1 day.

$$\text{III. } \frac{(20 \times 16)}{10} \text{ workers can finish it in 10 days.}$$

32 workers can finish it in 10 days.

$$\text{III. } \frac{1}{8} \text{ work can be completed by } (8 \times 5) \text{ workers in 1 day.}$$

Whole work can be completed by $(8 \times 5 \times 8)$ workers in 1 day.

$$\text{IV. } \frac{8 \times 5 \times 8}{10} \text{ workers in 10 days} = 32 \text{ workers in 10 days.}$$

Any one of the three gives the answer.

Correct answer is (E).

5.8 men and 14 women are working together in a field. After working for 3 days, 5 men and 8 women leave the work. How many more days will be required to complete the work?

I. 19 men and 12 women together can complete the work in 18 days.

II. 16 men can complete two-third of the work in 16 days.

III. In 1 day, the work done by three men is equal to the work done by four women.

- A.I only
- B.II only
- C.III only
- D.I or II or III
- E. II or III only

Answer & Explanation

Answer: Option D

Explanation:

Clearly, I only gives the answer.

Similarly, II only gives the answer.

And, III only gives the answer.

Correct answer is (D).

SIMPLE INTEREST

1. The simple interest on a sum of money is Rs. 50. What is the sum?

- I. The interest rate is 10% p.a.
- II. The sum earned simple interest in 10 years.
- A.I alone sufficient while II alone not sufficient to answer
- B.II alone sufficient while I alone not sufficient to answer
- C.Either I or II alone sufficient to answer
- D.Both I and II are not sufficient to answer
- E. Both I and II are necessary to answer

Answer & Explanation

Answer: Option E

Explanation:

Given : S.I. = Rs. 50.

I gives, R = 10% p.a.

II gives, T = 10 years.

$$\begin{array}{rcl} 100 \times \text{S.I.} & & 100 \times 50 \\ \text{Sum} = & \text{= Rs.} & = \text{Rs. 50.} \\ & \text{T} \times \text{R} & 10 \times 10 \end{array}$$

Thus, I and II together give the answer.

Correct answer is (E).

2. What is the sum which earned interest?

- I. The total simple interest was Rs. 7000 after 7 years.
 II. The total of sum and simple interest was double of the sum after 5 years.
 A.I alone sufficient while II alone not sufficient to answer
 B. II alone sufficient while I alone not sufficient to answer
 C. Either I or II alone sufficient to answer
 D. Both I and II are not sufficient to answer
 E. Both I and II are necessary to answer

Answer & Explanation

Answer: Option E

Explanation:

Let the sum be Rs. x .

I gives, S.I. = Rs. 7000 and T = 7 years.

II gives, Sum + S.I. for 5 years = 2 x Sum Sum = S.I. for 5 years.

Now, S.I. for 7 years = Rs. 7000.

$$\frac{7000}{7} = \text{Rs. } 1000.$$

Thus, I and II both are needed to get the answer.

Correct answer is (E).

3. What percentage of simple interest per annum did Anand pay to Deepak?

- I. Anand borrowed Rs. 8000 from Deepak for four years.
 II. Anand returned Rs. 8800 to Deepak at the end of two years and settled the loan.
 A.I alone sufficient while II alone not sufficient to answer
 B. II alone sufficient while I alone not sufficient to answer
 C. Either I or II alone sufficient to answer
 D. Both I and II are not sufficient to answer
 E. Both I and II are necessary to answer

Answer & Explanation

Answer: Option E

Explanation:

Let the rate be $R\%$ p.a.

I gives, $P = \text{Rs. } 8000$ and $T = 4$ years.

II gives, S.I. = $(8800 - 8000) = \text{Rs. } 800$.

$$R = \frac{100 \times S.I.}{P \times T} = \frac{100 \times 800}{8000 \times 4} = \frac{1}{2}\% \text{ p.a.}$$

Thus, I and II both are needed to get the answer.

Correct answer is (E).

4. What is the rate of simple interest?
 I. The total interest earned was Rs. 4000.
 II. The sum was invested for 4 years.
 A.I alone sufficient while II alone not sufficient to answer
 B. II alone sufficient while I alone not sufficient to answer
 C. Either I or II alone sufficient to answer
 D. Both I and II are not sufficient to answer
 E. Both I and II are necessary to answer

Answer & Explanation

Answer: Option D

Explanation:

$$\text{We know that, } R = \frac{100 \times S.I.}{P \times T}$$

Now, I gives, S.I. = Rs. 4000.

II gives, $T = 4$ years.

But, P is unknown. So, we cannot find R .
 So, given data is insufficient to get R .

Correct answer is (D).

5. What is the principal sum?

- I. The sum amounts to Rs. 690 in 3 years at S.I.
 II. The sum amounts to Rs. 750 in 5 years at S.I.
 III. The rate of interest is 5% p.a.
 A.I and III only
 B. II and III only
 C.I and II only
 D.I and III only, or II and III only
 E. Any two of the three

Answer & Explanation

Answer: Option E

Explanation:

Clearly, any of the three will give us the answer.

Correct answer is (E).

COMPOUND INTEREST

1. What is the rate of compound interest?

- I. The principal was invested for 4 years.
 II. The earned interest was Rs. 1491.
 A.I alone sufficient while II alone not sufficient to answer

- B. II alone sufficient while I alone not sufficient to answer
 C. Either I or II alone sufficient to answer
 D. Both I and II are not sufficient to answer
 E. Both I and II are necessary to answer

Answer & Explanation

Answer: Option D

Explanation:

Let Principal = Rs. P and Rate = R% p.a. Then,

$$\begin{aligned} \text{Amount} &= \text{Rs. } P \quad 1 + \frac{R}{100}^4 \\ \text{C.I.} &= P \quad 1 + \frac{R}{100}^{4-1} \\ P &\quad 1 + \frac{R}{100}^{4-1} = 1491. \end{aligned}$$

Clearly, it does not give the answer.

Correct answer is (E).

2. What will be compounded amount?

- I. Rs. 200 was borrowed for 192 months at 6% compounded annually.
 II. Rs. 200 was borrowed for 16 years at 6%.
 A.I alone sufficient while II alone not sufficient to answer
 B. II alone sufficient while I alone not sufficient to answer
 C. Either I or II alone sufficient to answer
 D. Both I and II are not sufficient to answer
 E. Both I and II are necessary to answer

Answer & Explanation

Answer: Option C

Explanation:

$$\begin{aligned} \text{I. Amount} &= \text{Rs. } 200 \times 1 + \frac{6}{100}^{16} \\ \text{II. Amount} &= \text{Rs. } 200 \times 1 + \frac{6}{100}^{16} \end{aligned}$$

Thus, I as well as II gives the answer.

Correct answer is (C).

3. An amount of money was lent for 3 years. What will be the difference between the simple and the compound interest earned on it at the same rate?

- I. The rate of interest was 8 p.c.p.a.

- II. The total amount of simple interest was Rs. 1200.
 A.I alone sufficient while II alone not sufficient to answer
 B. II alone sufficient while I alone not sufficient to answer
 C. Either I or II alone sufficient to answer
 D. Both I and II are not sufficient to answer
 E. Both I and II are necessary to answer

Answer & Explanation

Answer: Option E

Explanation:

Given: T = 3 years.

I. gives: R = 8% p.a.

II. gives: S.I. = Rs. 1200.

Thus, P = Rs. 5000, R = 8% p.a. and T = 3 years.

Difference between C.I. and S.I. may be obtained.

So, the correct answer is (E).

4. What is the rate of interest p.c.p.a.?

- I. An amount doubles itself in 5 years on simple interest.
 II. Difference between the compound interest and the simple interest earned on a certain amount in 2 years is Rs. 400.
 III. Simple interest earned per annum is Rs. 2000.
 A.I only
 B. II and III only
 C. All I, II and III
 D. Any two of the three
 E. I only or II and III only

Answer & Explanation

Answer: Option E

Explanation:

$$\begin{aligned} \text{I. } \frac{P \times R \times 5}{100} &= P & R &= 20. \\ \text{II. } P \times 1 + \frac{R}{100}^2 - P - \frac{P \times R \times 2}{100} &= 400 & PR^2 &= 4000000. \\ \text{III. } \frac{P \times R \times 1}{100} &= 2000 & PR &= 200000. \\ PR^2 &= 4000000 & PR &= 200000. \\ PR &= 200000 & R &= 20. \end{aligned}$$

Thus I only or (II and III) give answer.

Correct answer is (E).

5. What will be the compound interest earned on an amount of Rs. 5000 in 2 years?
- The simple interest on the same amount at the same rate of interest in 5 years is Rs. 2000.
 - The compound interest and the simple interest earned in one year is the same.
 - The amount becomes more than double on compound interest in 10 years.
- A.I only
B.I and II only
C.II and III only
D.I and III only
E.None of these

Answer & Explanation

Answer: Option A

Explanation:

P = Rs. 5000 & T = 2 years.

I. S.I. on Rs. 5000 in 5 years is Rs. 2000.

$$5000 \times R \times 5$$

$$100 = 2000 \quad R = 8.$$

Thus I only gives the answer.

Correct answer is (A).

- 6.Mr. Gupta borrowed a sum of money on compound interest. What will be the amount to be repaid if he is repaying the entire amount at the end of 2 years?

- The rate of interest is 5 p.c.p.a.
- Simple interest fetched on the same amount in one year is Rs. 600.
- The amount borrowed is 10 times the simple interest in 2 years.

- A.I only
B.III only
C.I or II only
D.II and Either I or III only
E.All I, II and III are required

Answer & Explanation

Answer: Option D

Explanation:

I. gives, Rate = 5% p.a.

II. gives, S.I. for 1 year = Rs. 600.

III. gives, sum = 10 x (S.I. for 2 years).

Now I, and II give the sum.

For this sum, C.I. and hence amount can be obtained.

Thus, III is redundant.

Again, II gives S.I. for 2 years = Rs. (600×2) = Rs. 1200.

Now, from III, Sum = Rs. (10×1200) = Rs . 12000.

$$\text{Thus, Rate} = \frac{100 \times 1200}{2 \times 12000} = 5\% \text{ p.a.}$$

Thus, C.I. for 2 years and therefore, amount can be obtained.

Thus, I is redundant.

Hence, I or III redundant.

PROFIT AND LOSS

1. A man mixes two types of rice (X and Y) and sells the mixture at the rate of Rs. 17 per kg. Find his profit percentage.

- The rate of X is Rs. 20 per kg.
- The rate of Y is Rs. 13 per kg.

A.I alone sufficient while II alone not sufficient to answer

B.II alone sufficient while I alone not sufficient to answer

C.Either I or II alone sufficient to answer

D.Both I and II are not sufficient to answer

E. Both I and II are necessary to answer

Answer & Explanation

Answer: Option D

Explanation:

The ratio, in which X and Y are mixed, is not given.

So, both I and II together cannot give the answer.

Correct answer is (D).

2. By selling a product with 20% profit, how much profit was earned?

- The difference between cost and selling price is Rs. 40.
- The selling price is 120 percent of the cost price.

A.I alone sufficient while II alone not sufficient to answer

B.II alone sufficient while I alone not sufficient to answer

C.Either I or II alone sufficient to answer

D.Both I and II are not sufficient to answer

E. Both I and II are necessary to answer

Answer & Explanation

Answer: Option A

Explanation:

Gain = 20%

$$\text{I. Profit} = (\text{S.P.}) - (\text{C.P.}) = \text{Rs. } 40.$$

Thus, I give the answer. But, II does not give the answer.

Correct answer is (A).

3.A shopkeeper sells some articles at the profit of 25% on the original price. What is the exact amount of profit? To find the answer, which of the following information given in Statements I and II is/are necessary?

- I. Sale price of the article
- II. Number of articles sold

- A.Only I is necessary
- B. Only II is necessary
- C. Either I or II is necessary
- D. Both I and II are necessary
- E. None of these

Answer & Explanation

Answer: Option D

Explanation:

Gain = 25% of C.P.

In order to find gain, we must know the sale price of each article and the number of articles sold.

Correct answer is (D).

4. A shopkeeper sells some toys at Rs. 250 each. What percent profit does he make? To find the answer, which of the following information given in Statements I and II is/are necessary?

- I. Number of toys sold.
- II. Cost price of each toy.

- A.Only I is necessary
- B. Only II is necessary
- C. Both I and II are necessary
- D. Either I or II ins necessary
- E. None of these

Answer & Explanation

Answer: Option B

Explanation:

S.P. = Rs. 250 each.

To find gain percent, we must know the C.P. of each.

Correct answer is (B).

5.By selling an article what is the profit percent gained?

- I. 5% discount is given on list price.
- II. If discount is not given, 20% profit is gained.
- III. The cost price of the articles is Rs. 5000.
- A.Only I and II
- B. Only II and II
- C. Only I and III
- D.All I, II and III
- E. None of these

Answer & Explanation

Answer: Option A

Explanation:

I. Let the list price be Rs. x .

$$\text{Then, S.P.} = 95\% \text{ of } \text{Rs. } x = \text{Rs. } \frac{95}{100}x = \text{Rs. } \frac{19}{20}x$$

II. When S.P. = Rs. x and gain = 20%.

$$\text{Then, C.P.} = \text{Rs. } \frac{100}{120}x = \text{Rs. } \frac{5}{6}x$$

$$\text{Gain} = \frac{19x - 5x}{20} = \frac{14x}{20} = \frac{7x}{10}$$

$$\text{Gain \%} = \frac{7x}{60} \times \frac{100}{5x} \% = 14\%$$

Thus, I and II only give the answer.

Correct answer is (A).

6. What was the percentage of discount given?

- I. 23.5% profit was earned by selling an almirah for Rs. 12,350.
- II. If there were no discount, the earned profit would have been 30%.
- III. The cost price of the almirah was Rs. 10,000.

- A.Only I and II
- B. Only II and III
- C.Only I and III
- D.Any two of the three
- E. None of these

Answer & Explanation

Answer: Option E

Explanation:

I. S.P. = Rs. 12350, Gain = 23.5%

$$\text{C.P.} = \text{Rs. } \frac{100}{123.5} \times 12350 = \text{Rs. } 10,000.$$

II. M.P. = 130% of C.P. = 130% of Rs. 10,000 = Rs. 13,000.

From I and II, discount = Rs. (13000 - 12350) = Rs. 650.

$$\text{Discount \%} = \frac{650}{13000} \times 100 \% = 5\%$$

Thus, I and II give the answer.

II and III can not give the answer. Because we require profit percentage with discount and profit percentage without discount. So II and III are not sufficient.

Since III gives C.P. = Rs. 10,000, I and III give the answer.

Therefore, I and II [or] I and III give the answer.

Correct answer is (E).

7.What is the percent profit earned by the shopkeeper on selling the articles in his shop?

- I. Labeled price of the articles sold was 130% of the cost price.
- II. Cost price of each article was Rs. 550.
- III. A discount of 10% on labeled price was offered.

A.Only I

B. Only II

C.I and III

D.All the three are required

E. Question cannot be answer even with information in all the three statements.

Answer & Explanation

Answer: Option C

Explanation:

I. Let C.P. be Rs. x .

$$\begin{array}{rcl} \text{Then, M.P.} = 130\% \text{ of } x = \text{Rs.} & 13x \\ & 10 \\ & . \end{array}$$

III. S.P. = 90% of M.P.

$$\begin{array}{rcl} \text{Thus, I and III give, S.P.} = \text{Rs.} & 90x & 13x \\ & 100 & 10 \\ & = \text{Rs.} & 100 \\ \text{Gain} = \text{Rs.} & 117x - x & = \text{Rs.} \\ & 100 & 100 \end{array}$$

Thus, from I and III, gain % can be obtained.

Clearly, II is redundant.

PARTNERSHIP

1.Ravi, Gagan and Nitin are running a business firm in partnership. What is Gagan's share in the profit earned by them?

I. Ravi, Gagan and Nitin invested the amounts in the ratio of 2 : 4 : 7.

II. Nitin's share in the profit is Rs. 8750.

A.I alone sufficient while II alone not sufficient to answer

B. II alone sufficient while I alone not sufficient to answer

C.Either I or II alone sufficient to answer

D.Both I and II are not sufficient to answer

E. Both I and II are necessary to answer

Answer & Explanation

Answer: Option E

Explanation:

Let us name Ravi, Gagan and Nitin by R, G and N respectively.

I. R : G : N = 2 : 4 : 7.

II. N = 8750..

From I and II, we get:

When N = 7, then G = 4.

When N = 8750, then G = $\frac{4}{7} \times 8750 = 5000$.

Thus, both I and II are needed to get the answer.

Correct answer is (E).

2. Rahul, Anurag and Vivek started a business together. In what proportion would the annual profit be distributed among them?

I. Rahul got one-fourth of the profit.

II. Rahul and Vivek contributed 75% of the total investment.

A.I alone sufficient while II alone not sufficient to answer

B. II alone sufficient while I alone not sufficient to answer

C.Either I or II alone sufficient to answer

D.Both I and II are not sufficient to answer

E. Both I and II are necessary to answer

Answer & Explanation

Answer: Option E

Explanation:

Let the total investment be Rs. x .

$$\begin{array}{l} \text{Then, R} = \frac{x}{4} \\ \text{R} + \text{V} = \frac{75}{100}x \\ \text{V} = \frac{3x}{4} \\ \text{A} = x - \frac{3x}{4} = \frac{x}{4} \\ \text{R} : \text{A} : \text{V} = \frac{x}{4} : \frac{x}{4} : \frac{x}{2} = 1 : 1 : 2. \end{array}$$

Thus, both I and II are needed to get the answer.

Correct answer is (E).

3.What is R's share of profit in a joit venture?

I. Q started business investing Rs. 80,000.

II. R joined him after 3 months.

III. P joined after 4 months with a capital of Rs. 1,20,000 and got Rs. 6000 as his share profit.

A.All I, II and III

B.I and III only

C.II and III only

D.Even with all I, II and III, the answer cannot be arrived at

E. None of these

Answer & Explanation

Answer: Option D

Explanation:

From I, II and III, we get $P : Q : R = (120000 \times 8) : (80000 \times 12) : (x \times 9)$.

Since R's investment is not given, the above ratio cannot be give.

Given data is inadequate.

Correct answer is (E).

4.How much did Rohit get as profit at the year-end in the business done by Nitin, Rohit and Kunal?

I.

Kunal invested Rs. 8000 for nine months, his profit was times that of Rohit's and his investment was four times that of Nitin.

II. Nitin and Rohit invested for one year in the proportion 1 : 2 respectively.

III. The three together got Rs. 1000 as profit at the year end.

A.Only I and II

B. Only I and III

C. Question cannot be answered even with the information in all the three statements.

D.All I, II and III

E. None of these

Answer & Explanation

Answer: Option D

Explanation:

I and II give:

$K = \text{Rs. } (8000 \times 9)$ for 1 month = Rs. 72000 for 1 month.

$N = \text{Rs. } \frac{1}{4} \times 8000 \times 12$ for 1 month = Rs. 24000 for 1 month.

$R = \text{Rs. } 48000$ for 1 month.

$K : N : R = 72000 : 24000 : 48000 = 3 : 1 : 2$.

III gives, total profit = Rs. 1000.

Rohit's share = Rs. $1000 \times \frac{2}{6} = \text{Rs. } 333\frac{1}{3}$

Correct answer is (D).

5.Three friends, P, Q and R started a partnership business investing money in the ratio of 5 : 4 : 2 respectively for a period of 3 years. What is the amount received by P as his share profit?

I. Total amount invested in the business in Rs. 22,000.

II.

Profit earned at the end of 3 years is of the total investment.

III. The average amount of profit earned per year is Rs. 2750.

A.I or II or III

B.Either III only, or I and II together

C.Any two of the three

D.All I, II and III are required.

E. None of these

Answer & Explanation

Answer: Option B

Explanation:

I and II give, profit after 3 years = Rs. $\frac{3}{8} \times 22000 = \text{Rs. } 8250$.

From III also, profit after 3 years = Rs. $(2750 \times 3) = \text{Rs. } 8250$.

$P's \text{ share} = \text{Rs. } \frac{5}{11} \times 8250 = \text{Rs. } 3750$.

Thus, (either III is redundant [or] I and II are redundant).

Correct answer is (B).

PROBLEMS ON AGES

1.What is Sonia's present age?

I. Sonia's present age is five times Deepak's present age.

II. Five years ago her age was twenty-five times Deepak's age at that time.

A.I alone sufficient while II alone not sufficient to answer

B. II alone sufficient while I alone not sufficient to answer

C.Either I or II alone sufficient to answer

D.Both I and II are not sufficient to answer

E. Both I and II are necessary to answer

Answer & Explanation

Answer: Option E

Explanation:

I. $S = 5D$ $D = 5$ (i)

II. $S - 5 = 25(D - 5)$ $S = 25D - 120$ (ii)

Using (i) in (ii), we get $S = 25 \times \frac{S}{5} - 120$

$4S = 120$.

$S = 30$.

Thus, I and II both together give the answer. So, correct answer is (E).

2. Average age of employees working in a department is 30 years. In the next year, ten workers will retire. What will be the average age in the next year?

- I. Retirement age is 60 years.
II. There are 50 employees in the department.

- A.I alone sufficient while II alone not sufficient to answer
B. II alone sufficient while I alone not sufficient to answer
C. Either I or II alone sufficient to answer
D. Both I and II are not sufficient to answer
E. Both I and II are necessary to answer

Answer & Explanation

Answer: Option E

Explanation:

- I. Retirement age is 60 years.
II. There are 50 employees in the department.

Average age of 50 employees = 30 years.

Total age of 50 employees = (50×30) years = 1500 years.

Number of employees next year = 40.

Total age of 40 employees next year $(1500 + 40 - 60 \times 10) = 940$.

Average age next year = $\frac{940}{40}$ years = $23\frac{1}{2}$ years.

Thus, I and II together give the answer. So, correct answer is (E).

3. Divya is twice as old as Shruti. What is the difference in their ages?

- I. Five years hence, the ratio of their ages would be 9 : 5.
II. Ten years back, the ratio of their ages was 3 : 1.

- A.I alone sufficient while II alone not sufficient to answer
B. II alone sufficient while I alone not sufficient to answer
C. Either I or II alone sufficient to answer
D. Both I and II are not sufficient to answer
E. Both I and II are necessary to answer

Answer & Explanation

Answer: Option C

Explanation:

Let Divya's present age be D years and Shruti's present age b S years

Then, $D = 2 \times S$

$D - 2S = 0$ (i)

I. $\frac{D+5}{S+5} = \frac{9}{5}$ (ii)

$$\text{II. } \frac{D-10}{S-10} = \frac{3}{1} \dots \text{(iii)}$$

From (ii), we get : $5D + 25 = 9S + 45$

$5D - 9S = 20$ (iv)

From (iii), we get : $D - 10 = 3S - 30$

$D - 3S = -20$ (v)

Thus, from (i) and (ii), we get the answer.

Also, from (i) and (iii), we get the answer.

I alone as well as II alone give the answer. Hence, the correct answer is (C).

4. What is Arun's present age?

- I. Five years ago, Arun's age was double that of his son's age at that time.
II. Present ages of Arun and his son are in the ratio of 11 : 6 respectively.
III. Five years hence, the respective ratio of Arun's age and his son's age will become 12 : 7.
A. Only I and II
B. Only II and III
C. Only I and III
D. Any two of the three
E. None of these

Answer & Explanation

Answer: Option D

Explanation:

II. Let the present ages of Arun and his son be $11x$ and $6x$ years respectively.

I. 5 years ago, Arun's age = $2 \times$ His son's age.

III. 5 years hence, $\frac{\text{Arun's Age}}{\text{Son's age}} = \frac{12}{7}$

Clearly, any two of the above will give Arun's present age.

Correct answer is (D).

5. What is Ravi's present age?

- I. The present age of Ravi is half of that of his father.
II. After 5 years, the ratio of Ravi's age to that of his father's age will be 6 : 11.
III. Ravi is 5 years younger than his brother.
A.I and II only
B. II and III only
C.I and III only
D.All I, II and III
E. Even with all the three statements answer cannot be determined.

Answer & Explanation

Answer: Option A

Explanation:

I. Let Ravi's present age be x years. Then, his father's present age = $2x$ years.

II. After 5 years, $\frac{\text{Ravi's age}}{\text{Father's age}} = \frac{6}{11}$

III. Ravi is younger than his brother.

From I and II, we get $\frac{x+5}{2x+5} = \frac{6}{11}$. This gives x , the answer.

Thus, I and II together give the answer. Clearly, III is redundant.

Correct answer is (A).

6.What is the present age of Tanya?

I. The ratio between the present ages of Tanya and her brother Rahul is $3 : 4$ respectively.

II. After 5 years the ratio between the ages of Tanya and Rahul will be $4 : 5$.

III. Rahul is 5 years older than Tanya.

A.I and II only

B.II and III only

C.I and III only

D.All I, II and III

E. Any two of the three

Answer & Explanation

Answer: Option E

Explanation:

I. Let the present ages of Tanya and Rahul be $3x$ years and $4x$ years.

II. After 5 years, (Tanya's age) : (Rahul's age) = $4 : 5$.

III. $(\text{Rahul's age}) = (\text{Tanya's age}) + 5$.

From I and II, we get $\frac{3x+5}{4x+5} = \frac{4}{5}$. This gives x .

\therefore Tanya's age = $3x$ can be found. Thus, I and II give the answer.

From I and III, we get $4x = 3x + 5$. This gives x .

\therefore Tanya's age = $3x$ can be found. Thus, I and III give the answer.

From III : Let Tanya's present age be t years.

Then Rahul's present age = $(t + 5)$ years.

Thus, from II and III, we get : $\frac{t}{t+5} = \frac{4}{5}$. This gives t .

Thus, II and III give the answer.

\therefore Correct answer is (E).

7.What will be the ratio between ages of Sam and Albert after 5 years?

I. Sam's present age is more than Albert's present age by 4 years.

II. Albert's present age is 20 years.

III. The ratio of Albert's present age to Sam's present age is $5 : 6$.

A.Any two of I, II and III

B.II only

C.III only

D.I or III only

E.II or III only

Answer & Explanation

Answer: Option A

Explanation:

Clearly, any two of the given statements will give the answer and in each case, the third is redundant.

Correct answer is (A).

8.What is the difference between the present ages of Ayush and Deepak?

I. The ratio between Ayush's present age and his age after 8 years $4 : 5$.

II. The ratio between the present ages of Ayush and Deepak is $4 : 3$.

III. The ratio between Deepak's present age and his age four years ago is $6 : 5$.

A.Any two of I, II and III

B.I or III only

C.Any one of the three

D.All I, II and III are required

E.Even with all I, II and III, the answer cannot be obtained.

Answer & Explanation

Answer: Option A

Explanation:

Clearly, any two of the given statements will give the answer and in each case, the third is redundant.

AVERAGE

1.The average age of P, Q, R and S is 30 years. How old is R?

I. The sum of ages of P and R is 60 years.

II. S is 10 years younger than R.

A.I alone sufficient while II alone not sufficient to answer

B.II alone sufficient while I alone not sufficient to answer

C.Either I or II alone sufficient to answer

D.Both I and II are not sufficient to answer

E. Both I and II are necessary to answer

Answer & Explanation

Answer: Option D

Explanation:

$$P + Q + R + S = (30 \times 4)$$

I. $P + R = 60$ (ii)

II. $S = (R - 10)$ (iii)

From (i), (ii) and (iii), we cannot find R.

$$P + Q + R + S = 120 \dots \text{(i)}$$

Number of candidates interviewed by B = $(x + 1)$.

$$x + (x + 2) + (x + 1) = 45$$

$$3x = 42$$

$$x = 14$$

Hence, the correct answer is (B).

4. How many marks did Tarun secure in English?

I. The average mark obtained by Tarun in four subjects including English is 60.

II. The total marks obtained by him in English and Mathematics together are 170.

III. The total marks obtained by him in Mathematics and Science together are 180.

A.I and II only

B.II and III only

C.I and III only

D.All I, II and III

E. None of these

Answer & Explanation

Answer: Option D

Explanation:

Let there be x children.

I gives, age of teacher = x years.

II gives, average age of $(x + 1)$ persons = $(x + 1)$ years.

$$\text{Teacher's age} = (x + 1)(x + 1) - x^2 = (x^2 + 1 + 2x) - x^2 = (1 + 2x)$$

Thus, teacher's age cannot be obtained.

Correct answer is (D)

3. How many candidates were interviewed everyday by the panel A out of the three panels A, B and C?

I. The three panels on average interview 15 candidates every day.

II. Out of a total of 45 candidates interviewed everyday by the three panels, the number of candidates interviewed by panel A is more by 2 than the candidates interviewed by panel C and is more by 1 than the candidates interviewed by panel B.

A. I alone sufficient while II alone not sufficient to answer B. II alone sufficient while I alone not sufficient to answer

C. Either I or II alone sufficient to answer D. Both I and II are not sufficient to answer

E. Both I and II are necessary to answer

Answer & Explanation

Answer: Option B

Explanation:

I. Total candidates interviewed by 3 panels = $(15 \times 3) = 45$.

II. Let x candidates be interviewed by C.

Number of candidates interviewed by A = $(x + 2)$.

Correct answer is (E).

5. In a cricket team, the average age of eleven players is 28 years. What is the age of the captain?

I. The captain is eleven years older than the youngest player.

II. The average age of 10 players, other than the captain is 27.3 years.

III. Leaving aside the captain and the youngest player, the average ages of three groups of three players each are 25 years, 28 years and 30 years respectively.

A. Any two of the three B. All I, II and III

C. II only or I and III only D. II and III only

E. None of these

Answer & Explanation

Answer: Option C

Explanation:

Total age of 11 players = (28×11) years = 308 years.

I. $C = Y + 11$ C - Y = 11 (i)

II. Total age of 10 players (excluding captain) = (27.3×10) years = 273 years.

Age of captain = $(308 - 273)$ years = 35 years.

Thus, C = 35. (ii)

From (i) and (ii), we get Y = 24

III. Total age of 9 players = $[(25 \times 3) + (28 \times 3) + (30 \times 3)]$ years = 249 years.

C + Y = $(308 - 249)$ = 59 (iii)

From (i) and (iii), we get C = 35.

Thus, II alone gives the answer.

Also, I and III together give the answer.

Correct answer is (C).

AREA

1. The area of playground is 1600 m^2 . What is the perimeter?

I. It is a perfect square playground.

II. It costs Rs. 3200 to put a fence around the playground at the rate of Rs. 20 per metre.

A.I alone sufficient while II alone not sufficient to answer

B. II alone sufficient while I alone not sufficient to answer

C.Either I or II alone sufficient to answer

D.Both I and II are not sufficient to answer

E. Both I and II are necessary to answer

Answer & Explanation

Answer: Option C

Explanation:

Area = 1600 m^2 .

I. Side = $\sqrt{1600}$ m = 40 m. So, perimeter = (40×4) m = 160 m.

I alone gives the answer.

II. Perimeter = $\frac{\text{Total cost}}{\text{Cost per metre}} = \frac{3200}{20} \text{ m} = 160 \text{ m.}$

II alone gives the answer.

Correct answer is (C).

2. The area of a rectangle is equal to the area of right-angles triangle. What is the length of the

rectangle?

I. The base of the triangle is 40 cm.

II. The height of the triangle is 50 cm.

A.I alone sufficient while II alone not sufficient to answer

B. II alone sufficient while I alone not sufficient to answer

C.Either I or II alone sufficient to answer

D.Both I and II are not sufficient to answer

E. Both I and II are necessary to answer

Answer & Explanation

Answer: Option D

Explanation:

Given: Area of rectangle = Area of a right-angles triangle.

$$\frac{1}{2} \times b \times H$$

I gives, B = 40 cm.

II gives, H = 50 cm.

Thus, to find b , we need b also, which is not given.

Given data is not sufficient to give the answer.

Correct answer is (D).

3. What is the height of the triangle?

I. The area of the triangle is 20 times its base.

II. The perimeter of the triangle is equal to the perimeter of a square of side 10 cm.

A.I alone sufficient while II alone not sufficient to answer

B. II alone sufficient while I alone not sufficient to answer

C.Either I or II alone sufficient to answer

D.Both I and II are not sufficient to answer

E. Both I and II are necessary to answer

Answer & Explanation

Answer: Option A

Explanation:

$$\frac{1}{2} \times A \times B = 20 \times B \quad H = 40.$$

I alone gives the answer.

II gives, perimeter of the triangle = 40 cm.

This does not give the height of the triangle.

Correct answer is (A).

4. What will be the cost of painting the inner walls of a room if the rate of painting is Rs. 20 per square foot?

- I. Circumference of the floor is 44 feet.
- II. The height of the wall of the room is 12 feet.
- A.I alone sufficient while II alone not sufficient to answer
- B.II alone sufficient while I alone not sufficient to answer
- C.Either I or II alone sufficient to answer
- D.Both I and II are not sufficient to answer
- E. Both I and II are necessary to answer

Answer & Explanation

Answer: Option E

Explanation:

I gives, $2\pi R = 44$.

II gives, $H = 12$.

$$A = 2\pi RH = (4 \times 12).$$

Cost of painting = Rs. $(44 \times 12 \times 20)$.

Thus, I and II together give the answer.

Correct answer is (E).

- 5.What is the area of the hall?

- I. Material cost of flooring per square metre is Rs. 2.50
- II. Labour cost of flooring the hall is Rs. 3500
- III. Total cost of flooring the hall is Rs. 14,500.

- A.I and II only
- B.II and III only
- C.All I, II and III
- D.Any two of the three
- E.None of these

Answer & Explanation

Answer: Option C

Explanation:

I. Material cost = Rs. 2.50 per m^2

II. Labour cost = Rs. 3500.

III. Total cost = Rs. 14,500.

Let the area be A sq. metres.

$$\text{Material cost} = \text{Rs. } (14500 - 3500) = \text{Rs. } 11,000.$$

$$\begin{aligned} 5A &= 11000 \times 2 \\ 2 = 11000 &\quad A = 5 \end{aligned}$$

Thus, all I, II and III are needed to get the answer.

Correct answer is (C).

6. What is the area of a right-angled triangle?

- I. The perimeter of the triangle is 30 cm.
- II. The ratio between the base and the height of the triangle is 5 : 12.
- III. The area of the triangle is equal to the area of a rectangle of length 10 cm.
- A.I and II only
- B.II and III only
- C.I and III only
- D.III, and either I or II only
- E.None of these

Answer & Explanation

Answer: Option A

Explanation:

From II, base : height = 5 : 12.

Let base = $5x$ and height = $12x$.

Then, hypotenuse = $(5x)^2 + (12x)^2 = 13x$.

From I, perimeter of the triangle = 30 cm.

$$5x + 12x + 13x = 30 \quad x = 1.$$

So, base = $5x = 5$ cm, height = $12x = 12$ cm.

$$\text{Area} = \frac{1}{2} \times 5 \times 12 \text{ cm}^2 = 30 \text{ cm}^2.$$

Thus, I and II together give the answer.

Clearly III is redundant, since the breadth of the rectangle is not given.

Correct answer is (A).

7. What is the area of rectangular field?

- I. The perimeter of the field is 110 metres.
- II. The length is 5 metres more than the width.
- III. The ratio between length and width is 6 : 5 respectively.
- A.I and II only
- B.Any two of the three
- C.All I, II and III
- D.I, and either II or III only

E. None of these

Answer & Explanation

Answer: Option B

Explanation:

$$\text{I. } 2(l+b) = 110 \quad l+b = 55.$$

$$\text{II. } l = (b+5) \quad l - b = 5.$$

$$\text{III. } \begin{array}{r} l \\ = 6 \\ b \\ \hline 5 \end{array} \quad 5l - 6b = 0.$$

These are three equations in l and b . We may solve them pairwise.

Any two of the three will give the answer.

Correct answer is (B).

8. What is the area of the given rectangle?

I. Perimeter of the rectangle is 60 cm.

II. Breadth of the rectangle is 12 cm.

III. Sum of two adjacent sides is 30 cm.

A.I only

B. II only

C.I and II only

D.II and III only

E. II and either I or III

Answer & Explanation

Answer: Option E

Explanation:

From I and II, we can find the length and breadth of the rectangle and therefore the area can be obtained.

So, III is redundant.

Also, from II and III, we can find the length and breadth and therefore the area can be obtained.

So, I is redundant.

Correct answer is "II and either I or III".

9. What is the cost painting the two adjacent walls of a hall at Rs. 5 per m^2 which has no windows or doors?

I. The area of the hall is 24 sq. m .

II. The breadth, length and height of the hall are in the ratio of 4 : 6 : 5 respectively.

III. Area of one wall is 30 sq. m .

A.I only

B. II only

C.III only

D.Either I or III

E. All I, II and III are required.

Answer & Explanation

Answer: Option C

Explanation:

From II, let $l = 4x$, $b = 6x$ and $h = 5x$.

Then, area of the hall = $(24x^2)$ m^2 .

From I. Area of the hall = 24 m^2 .

From II and I, we get $24x^2 = 24 \quad x = 1$.

$l = 4 \text{ m}$, $b = 6 \text{ m}$ and $h = 5 \text{ m}$.

Thus, area of two adjacent walls = $[(l \times h) + (b \times h)] \text{ m}^2$ can be found out and so the cost of painting two adjacent walls may be found out.

Thus, III is redundant.

Correct answer is (C).

VOLUME AND SURFACE AREA

1. What is the volume of 32 metre high cylindrical tank?

I. The area of its base is 154 m^2 .

II. The diameter of the base is 14 m.

A.I alone sufficient while II alone not sufficient to answer

B. II alone sufficient while I alone not sufficient to answer

C.Either I or II alone sufficient to answer

D.Both I and II are not sufficient to answer

E. Both I and II are necessary to answer

Answer & Explanation

Answer: Option C

Explanation:

Given, height = 32 m.

I gives, area of the base = 154 m^2 .

Volume = (Area of the base x Height) = (154×32) m^3 .

Thus, I alone gives the answer.

II gives, radius of the base = 7 m.

$$\text{Volume} = r^2 h = \frac{22}{7} \times 7 \times 7 \times 32 \text{ m}^3 = 4928 \text{ m}^3.$$

Thus, II alone gives the answer.

Correct answer is (C).

2. Is a given rectangular block, a cube?

- I. At least 2 faces of the rectangular block are squares.
- II. The volume of the block is 64.
- A.I alone sufficient while II alone not sufficient to answer
- B.II alone sufficient while I alone not sufficient to answer
- C.Either I or II alone sufficient to answer
- D.Both I and II are not sufficient to answer
- E. Both I and II are necessary to answer

Answer & Explanation

Answer: Option D

Explanation:

I gives, any two of l, b, h are equal.

II gives, $l b h = 64$.

From I and II, the values of l, b, h may be (1, 1, 64), (2, 2, 16), (4, 4, 4).

Thus, the block may be a cube or cuboid.

Correct answer is (D).

3. What is the capacity of a cylindrical tank?

- I. Radius of the base is half of its height which is 28 metres.
- II. Area of the base is 616 sq. metres and its height is 28 metres.
- A.I alone sufficient while II alone not sufficient to answer
- B.II alone sufficient while I alone not sufficient to answer
- C.Either I or II alone sufficient to answer
- D.Both I and II are not sufficient to answer
- E. Both I and II are necessary to answer

Answer & Explanation

Answer: Option C

Explanation:

I gives, $h = 28$ m and $r = 14$.

Capacity = $r^2 h$, which can be obtained.

Thus, I alone gives the answer.

II gives, $r^2 = 616$ m² and $h = 28$ m.

Capacity = ($r^2 \times h$) = (616 × 28) m³.

Thus, II alone gives the answer.

Correct answer is (C).

4. What is the height of a circular cone?

- I. The area of that cone is equal to the area of a rectangle whose length is 33 cm.
- II. The area of the base of that cone is 154 sq. cm.
- A.I alone sufficient while II alone not sufficient to answer
- B.II alone sufficient while I alone not sufficient to answer
- C.Either I or II alone sufficient to answer
- D.Both I and II are not sufficient to answer
- E. Both I and II are necessary to answer

Answer & Explanation

Answer: Option D

Explanation:

II gives the value of r .

But, in I, the breadth of rectangle is not given.

So, we cannot find the surface area of the cone.

Hence, the height of the cone cannot be determined.

Correct answer is (D).

5. What is the volume of a cube?

- I. The area of each face of the cube is 64 square metres.
- II. The length of one side of the cube is 8 metres.
- A.I alone sufficient while II alone not sufficient to answer
- B.II alone sufficient while I alone not sufficient to answer
- C.Either I or II alone sufficient to answer
- D.Both I and II are not sufficient to answer
- E. Both I and II are necessary to answer

Answer & Explanation

Answer: Option C

Explanation:

Let each edge be a metres. Then,

$$I. a^2 = 64$$

$$a = 8 \text{ m}$$

$$\text{Volume} = (8 \times 8 \times 8) \text{ m}^3 = 512 \text{ m}^3.$$

Thus, I alone gives the answer.

II. $a = 8 \text{ m}$ Volume = $(8 \times 8 \times 8) \text{ m}^3 = 512 \text{ m}^3$.

Thus, II alone gives the answer.

Correct answer is (C).

6.What is the capacity of the cylindrical tank?

- I. The area of the base is 61,600 sq. cm.
- II. The height of the tank is 1.5 times the radius.
- III. The circumference of base is 880 cm.

- A.Only I and II
- B.Only II and III
- C.Only I and III
- D.Any two of the three
- E.Only II and either I or III

Answer & Explanation

Answer: Option E

Explanation:

$$\text{Capacity} = \pi r^2 h.$$

I gives, $\pi r^2 = 61600$. This gives r .

II gives, $h = 1.5 r$.

Thus, I and II give the answer.

Again, III gives $2\pi r = 880$. This gives r .

So, II and III also give the answer.

Correct answer is (E).

PROBLEMS ON NUMBERS

1.What is the number?

- I. The sum of the two digits is 8. The ratio of the two digits is 1 : 3.
- II. The product of the two digit of a number is 12. The quotient of two digits is 3.

A.I alone sufficient while II alone not sufficient to answer

B. II alone sufficient while I alone not sufficient to answer

C.Either I or II alone sufficient to answer

D.Both I and II are not sufficient to answer

E. Both I and II are necessary to answer

Answer & Explanation

Answer: Option C

Explanation:

Let the tens and units digit be x and y respectively. Then,

I. $x + y = 8$ and $\frac{x}{y} = \frac{1}{3}$

I gives, $4y = 24$ $y = 6$.

So, $x + 6 = 8$ $x = 2$.

II. $xy = 12$ and $\frac{x}{y} = \frac{3}{1}$

II gives, $x^2 = 36$ $x = 6$.

So, $3y = 6$ $y = 2$.

Therefore, Either I or II alone sufficient to answer.

2. What is the two-digit number?

- I. The difference between the two digits is 9.
- II. The sum of the digits is equal to the difference between the two digits.
- A.I alone sufficient while II alone not sufficient to answer
- B. II alone sufficient while I alone not sufficient to answer
- C.Either I or II alone sufficient to answer
- D.Both I and II are not sufficient to answer
- E. Both I and II are necessary to answer

Answer & Explanation

Answer: Option E

Explanation:

Let the tens and unit digits be x and y respectively. Then,

I. $x - y = 9$.

II. $x + y = x - y$.

From I and II, we get $x - y = 9$ and $x + y = 9$.

On solving, we get $x = 9$ and $y = 0$.

Required number is 90.

Thus, both I and II are needed to get the answer.

Correct answer is (E).

3. What is the two-digit number whose first digit is a and the second digit is b ? The number is

greater than 9.

- I. The number is multiple of 51.
- II. The sum of the digits a and b is 6.
- A. I alone sufficient while II alone not sufficient to answer
- B. II alone sufficient while I alone not sufficient to answer
- C. Either I or II alone sufficient to answer
- D. Both I and II are not sufficient to answer
- E. Both I and II are necessary to answer

Answer & Explanation

Answer: Option A

Explanation:

From statement I:

A two digit number, greater than 9 and multiple of 51 should be 51 itself.

Because, $2 \times 51 = 102$ (3 digit number). Therefore, I alone sufficient to answer.

From statement II:

A two digit number, greater than 9 and sum of the digit is 6.

It can be 15, 24, 33, 42, 51. So we cannot determine the required answer from the statement II alone.

Thus, I alone give the answer while II alone not sufficient to answer.

4. What is the two-digit number?

- I. The difference between the tow-digit number and the number formed by interchanging the digits is 27.
- II. The difference between the two digits is 3.
- III. The digit at unit's place is less than that at ten's place by 3.
- A. I and II only
- B. I and III only
- C. All I, II and III
- D. I, and either II or III
- E. Even with all I, II and III, answer cannot be give.

Answer & Explanation

Answer: Option E

Explanation:

Let the tens and units digit be x and y respectively.

$$\text{I. } (10x + y) - (10y + x) \quad x - y = 3.$$

$$\text{II. } x - y = 3.$$

$$\text{III. } x - y = 3.$$

Thus, even all the given three statements together do not give the answer.

Correct answer is (E).

STATEMENT AND ASSUMPTION

In each question below is given a statement followed by two assumptions numbered I and II. You have to consider the statement and the following assumptions and decide which of the assumptions is implicit in the statement.

Give answer

- (A) If only assumption I is implicit
- (B) If only assumption II is implicit
- (C) If either I or II is implicit
- (D) If neither I nor II is implicit
- (E) If both I and II are implicit.

1. **Statement:** The State government has decided to appoint four thousand primary school teachers during the next financial year.

Assumptions:

- 1. There are enough schools in the state to accommodate four thousand additional primary school teachers.
- 2. The eligible candidates may not be interested to apply as the government may not finally appoint such a large number of primary school teachers.

A. Only assumption I is implicit

B. Only assumption II is implicit

C. Either I or II is implicit

D. Neither I nor II is implicit

E. Both I and II are implicit

Answer & Explanation

Answer: Option A

Explanation:

Such decisions as given in the statement are taken only after taking the existing vacancies into consideration. So, I implicit while II isn't.

2. **Statement:** A warning in a train compartment - "To stop train, pull chain. Penalty for improper use Rs. 500."

Assumptions:

- 1. Some people misuse the alarm chain.
- 2. On certain occasions, people may want to stop a running train.

A. Only assumption I is implicit

B. Only assumption II is implicit

C. Either I or II is implicit

D. Neither I nor II is implicit

E. Both I and II are implicit

Answer & Explanation

Answer: Option E

Explanation:

Clearly, the penalty is imposed to prevent people from misusing the alarm chain. This means that some people misuse it. So, I is implicit. The alarm chain is provided to stop the running train in times of urgency. So, II is also implicit.

3. Statement: If it is easy to become an engineer, I don't want to be an engineer.

Assumptions:

1. An individual aspires to be professional.
2. One desires to achieve a thing which is hard earned.

- A. Only assumption I is implicit
B. Only assumption II is implicit
C. Either I or II is implicit
D. Neither I nor II is implicit
E. Both I and II are implicit

Answer & Explanation

Answer: Option B

Explanation:

Clearly, nothing is mentioned about the professional nature of the job. So, I is not implicit. The statement hints that one rejects a thing that is easy to achieve. So, II is implicit.

4. Statement: The concession in rail fares for the journey to hill stations has been cancelled because it is not needed for people who can spend their holidays there.

Assumptions:

1. Railways should give concession only to needy persons.
2. Railways should not encourage people to spend their holidays at hill stations.

- A. Only assumption I is implicit
B. Only assumption II is implicit
C. Either I or II is implicit
D. Neither I nor II is implicit
E. Both I and II are implicit

Answer & Explanation

Answer: Option A

Explanation:

The statement mentions that concessions should not be given to people who can afford to spend holidays in hill stations. This means they should be given only to needy persons. So, I is implicit. But, II does not follow from the statement and is not implicit.

5. Statement: "The bridge was built at the cost of Rs. 128 crores and even civil bus service is not utilizing it, what a pity to see it grossly underutilized." - A citizen's view on a new flyover linking east and west sides of a suburb.

Assumptions:

1. The building of such bridges does not serve any public objective.
 2. There has to be some accountability and utility of money spent on public projects.
- A. Only assumption I is implicit
B. Only assumption II is implicit
C. Either I or II is implicit
D. Neither I nor II is implicit
E. Both I and II are implicit

Answer & Explanation

Answer: Option B

Explanation:

Clearly, the statement expresses grave concern over a newly-built flyover not being utilized by public. This implies that such projects need to be taken up only after working out their utility and that the huge expenditure incurred on building such structures is worthwhile only if they prove useful for the public. Thus, only II is implicit.

6. Statement: The Government has decided to levy 2 percent on the tax amount payable for funding drought relief programmes.

Assumptions:

1. The Government does not have sufficient money to fund drought relief programmes.
2. The amount collected by way of surcharge may be adequate to fund these drought relief programmes.

- A. Only assumption I is implicit
B. Only assumption II is implicit
C. Either I or II is implicit
D. Neither I nor II is implicit
E. Both I and II are implicit

Answer & Explanation

Answer: Option E

Explanation:

Since a surcharge has been levied to fund drought relief programmes, it follows that the Government does not have sufficient money for the same. So, I is implicit. Besides, the percentage of surcharge must have been decided after studying the expected inflow in relation to amount of funds required. So, II is also implicit.

7. Statement: Try to steal this camera from our store - a display on a departmental store.

Assumptions:

1. People want to own a camera.
 2. The store has a video monitoring system to detect stealing.
- A. Only assumption I is implicit
B. Only assumption II is implicit
C. Either I or II is implicit
D. Neither I nor II is implicit
E. Both I and II are implicit

Answer & Explanation

Answer: Option B

Explanation:

Clearly, the owners of the store warn that one dare not try to steal the camera. So, II is implicit while I isn't.

8. Statement: Detergents should be used to clean clothes.

Assumptions:

1. Detergents form more lather.
2. Detergents help to dislodge grease and dirt.

- A. Only assumption I is implicit
B. Only assumption II is implicit
C. Either I or II is implicit
D. Neither I nor II is implicit
E. Both I and II are implicit

Answer & Explanation

Answer: Option B

Explanation:

Nothing is mentioned about lather formation by the detergent. So, I is not implicit. Also, detergents should be used as they clean clothes better and more easily. So, II is implicit.

9. Statement: It will be a substantial achievement in the field of education if one provides one school for every village in our country and enforce attendance.

Assumptions:

1. Children in villages do not attend school regularly.
2. Providing school to every village is desirable.

- A. Only assumption I is implicit
B. Only assumption II is implicit
C. Either I or II is implicit
D. Neither I nor II is implicit
E. Both I and II are implicit

Answer & Explanation

Answer: Option E

Explanation:

The statement lays stress on enforcing attendance. This implies that children in villages do not attend school regularly. So, I is implicit. Besides, the statement calls 'one school for every village' a 'substantial achievement'. So, II is also implicit.

10. Statement: The government has decided to disinvest large chunk of its equity in select public sector undertakings for a better fiscal management.

Assumptions:

1. The amount generated out of the disinvestment process may reduce substantially the mounting fiscal deficits.
2. There will be enough demand in the market for the shares of these undertakings.

- A. Only assumption I is implicit
B. Only assumption II is implicit
C. Either I or II is implicit
D. Neither I nor II is implicit
E. Both I and II are implicit

Answer & Explanation

Answer: Option A

Explanation:

The fact given in I directly follows from the phrase '..... for a better fiscal management' in the statement. So, I is implicit. However, the public response to the new policy cannot be ascertained. So, II is not implicit.

11. Statement: Never before such a lucid book was available on the topic.

Assumptions:

1. Some other books were available on this topic.
2. You can write lucid books on very few topics.

- A. Only assumption I is implicit
B. Only assumption II is implicit
C. Either I or II is implicit
D. Neither I nor II is implicit
E. Both I and II are implicit

Answer & Explanation

Answer: Option A

Explanation:

It follows from the statement that books on this topic were available before also but they were not 'lucid'. So, I is implicit. But a general comment as II cannot be made from the given statement. So, II is not implicit.

12. Statement: Please do not use lift while going down - an instruction on the top floor of a five-storey building.

Assumptions:

1. While going down, the lift is unable to carry any load.
2. Provision of lift is a matter of facility and not of right.

- A. Only assumption I is implicit
B. Only assumption II is implicit
C. Either I or II is implicit
D. Neither I nor II is implicit
E. Both I and II are implicit

Answer & Explanation

Answer: Option B

Explanation:

The statement requests people not to use lift while moving down. This implies that the lift may be used to move up and the request has been made so that more people can use the lift for ascending which would otherwise cause more physical stress than going down the stairs. So, only II is implicit.

13. **Statement:** "I have not received telephone bills for nine months inspite of several complaints"

- A telephone customer's letter to the editor of a daily

Assumptions:

1. Every customer has a right to get bills regularly from the telephone company.
2. The customer's complaints point to defect in the services which are expected to be corrected.

A. Only assumption I is implicit

B. Only assumption II is implicit

C. Either I or II is implicit

D. Neither I nor II is implicit

E. Both I and II are implicit

Answer & Explanation

Answer: Option E

Explanation:

The customer's eagerness to get the bills makes I implicit. Besides, the customer has written to the editor to bring the malfunctioning of the department to public notice. So, II is also implicit.

14. **Statement:** "This drink can be had either as it is, or after adding ice to it." - An advertisement.

Assumptions:

1. People differ in their preferences.
2. Some people will get attracted to the drink as it can be had as it is.

A. Only assumption I is implicit

B. Only assumption II is implicit

C. Either I or II is implicit

D. Neither I nor II is implicit

E. Both I and II are implicit

Answer & Explanation

Answer: Option E

Explanation:

The advertisement tells the different ways in which the drink can be had. This means that different people prefer to have it in a different way and that some people would prefer it only because it can be taken in a particular manner. So, both I and II are implicit.

15. **Statement:** Government has permitted unaided colleges to increase their fees.

Assumptions:

1. Unaided colleges are in financial difficulties.
2. Aided colleges do not need to increase fees.

A. Only assumption I is implicit

B. Only assumption II is implicit

C. Either I or II is implicit

D. Neither I nor II is implicit

E. Both I and II are implicit

Answer & Explanation

Answer: Option A

Explanation:

Unaided colleges have been allowed to increase their fees. This means that they are in financial difficulties. So, I is implicit. Nothing is mentioned about the aided colleges. So, II is not implicit.

16. **Statement:** Be humble even after being victorious.

Assumptions:

1. Many people are humble after being victorious.
2. Generally people are not humble.

A. Only assumption I is implicit

B. Only assumption II is implicit

C. Either I or II is implicit

D. Neither I nor II is implicit

E. Both I and II are implicit

Answer & Explanation

Answer: Option B

Explanation:

Clearly, nothing is mentioned about the nature of the people. So, I is not implicit. Also, the statement gives an advice of being humble even after being victorious. This means that generally people are not humble. So, II is implicit.

17. **Statement:** The government has decided to pay compensation to the tune of Rs. 1 lakh to the family members of those who are killed in railway accidents.

Assumptions:

1. The government has enough funds to meet the expenses due to compensation.
2. There may be reduction in incidents of railway accidents in near future.

A. Only assumption I is implicit

B. Only assumption II is implicit

C. Either I or II is implicit

D. Neither I nor II is implicit

E. Both I and II are implicit

Answer & Explanation

Answer: Option A

Explanation:

Clearly, the amount of compensation must have been decided keeping in mind the monetary position of the Government. So, I is implicit. However, nothing can be said about the frequency of railway accidents in future. So, II is not implicit.

18. Statement: Films have become indispensable for the entertainment of people.

Assumptions:

1. Films are the only media of entertainment.
2. People enjoy films.

- A. Only assumption I is implicit
B. Only assumption II is implicit
C. Either I or II is implicit
D. Neither I nor II is implicit
E. Both I and II are implicit

Answer & Explanation

Answer: Option B

Explanation:

'Films are indispensable' does not mean that they are the only means of entertainment. So, I is not implicit. Clearly, II follows from the statement. So, it is implicit.

19. Statement: Of all the newspapers published in Mumbai, readership of the "Times" is the largest in the Metropolis.

Assumptions:

1. 'Times' is not popular in mofussil areas.
2. 'Times' has the popular feature of cartoons on burning social and political issues.

- A. Only assumption I is implicit
B. Only assumption II is implicit
C. Either I or II is implicit
D. Neither I nor II is implicit
E. Both I and II are implicit

Answer & Explanation

Answer: Option D

Explanation:

Neither the volume of readership of the 'Times' in areas other than the Metropolis nor the reason for its huge acclamation is evident from the statement. So, neither I nor II is implicit.

20. Statement: Apart from the entertainment value of television, its educational value cannot be ignored.

Assumptions:

1. People take television to be a means of entertainment only.
2. The educational value of television is not realised properly.

- A. Only assumption I is implicit
B. Only assumption II is implicit
C. Either I or II is implicit
D. Neither I nor II is implicit
E. Both I and II are implicit

Answer & Explanation

Answer: Option E

Explanation:

The statement makes the first assumption clear though educational value is not to be ignored. So, I is implicit. That the educational value must not be ignored also shows that educational value is not realised properly. So, II is also implicit.

MAKING ASSUMPTIONS

1. Mark is working with a realtor to find a location for the toy store he plans to open in his town. He is looking for a place that is either in, or not too far from, the center of town and one that would attract the right kind of foot traffic. Which of the following locations should Mark's realtor call to his attention?

- A. storefront in a new high-rise building near the train station in the center of town whose occupants are mainly young, childless professionals who use the train to commute to their offices each day.
B. a little shop three blocks away from the town's main street, located across the street from an elementary school and next door to an ice cream store
C. a stand-alone storefront on a quiet residential street ten blocks away from the town's center
D. a storefront in a small strip mall located on the outskirts of town that is also occupied by a pharmacy and a dry cleaner

Answer & Explanation

Answer: Option B

Explanation:

This option is both near the center of town and in a location (near a school and an ice cream store) where children and their parents are sure to be around. This is the only option that meets both of Mark's requirements.

2. The neighborhood block association has received many complaints about people knocking on doors and soliciting money for an unknown charity organization even though door-to-door solicitation is prohibited by local laws. Three residents have provided descriptions of individuals who have come to their door asking for money.

Solicitor #1 is a white male, 20-25 years old, 5'9", 145 pounds, with very short brown hair. He

was wearing a dark blue suit and carrying a brown leather briefcase.

Solicitor #2 is a white male, 25-30 years old, 6'2", 200 pounds, with a shaved-head. He was wearing a red T-shirt and jeans.

Solicitor #3 is a white male, approximately 23 years old, 5'10", slight build, with short brown hair. He was wearing a blue suit.

Three days after the block association meeting, a resident noticed a man knocking on doors in the neighborhood and phoned the police to report the illegal activity. This solicitor was described as follows:

Solicitor #4 is a white male, 22 years old, 140 pounds, about 5'10", with short brown hair. He was carrying a briefcase and wearing a dark suit.

Based on this description, which of the three solicitations was also likely carried out by **Solicitor #4?**

- A.#1, #2, and #3
- B.#1, but not #2 and #3
- C.#1 and #3, but not #2
- D.#1 and #2, but not #3

Answer & Explanation

Answer: Option C

Explanation:

The solicitor described as #2 has a shaved head and is much taller and heavier than the solicitors described as #1 and #3. Therefore, choices a and d, which include #2, can be ruled out. Solicitors #1, #3, and #4 have such similar descriptions that the correct answer is clearly choice c.

3. Rita, an accomplished pastry chef who is well known for her artistic and exquisite wedding cakes, opened a bakery one year ago and is surprised that business has been so slow. A consultant she hired to conduct market research has reported that the local population doesn't think of her shop as one they would visit on a daily basis but rather a place they'd visit if they were celebrating a special occasion. Which of the following strategies should Rita employ to increase her daily business?

- A. making coupons available that entitle the coupon holder to receive a 25% discount on wedding, anniversary, or birthday cakes
- B. exhibiting at the next Bridal Expo and having pieces of one of her wedding cakes available for tasting
- C. placing a series of ads in the local newspaper that advertise the wide array of breads
- D.moving the bakery to the other side of town

Answer & Explanation

Answer: Option C

Explanation:

This is the only option that would encourage people to think of the bakery as a shop they would visit regularly and not just on special occasions.

4. Dr. Miller has a busy pediatric dentistry practice and she needs a skilled, reliable hygienist to keep things running smoothly. The last two people she hired were recommended by top dentists in the area, but they each lasted less than one month. She is now in desperate need of a hygienist who can competently handle the specific challenges of her practice. Which one of the following candidates should Dr. Miller consider most seriously?

Marilyn has been a hygienist for fifteen years, and her current employer, who is about to A.retire, says she is the best in the business. The clientele she has worked with consists of some of the wealthiest and most powerful citizens in the county.

Lindy recently graduated at the top of her class from one of the best dental hygiene B.programs in the state. Prior to becoming a dental hygienist, Lindy spent two years working in a day care center.

James has worked as a dental hygienist for three years in a public health clinic. He is very C.interested in securing a position in a private dental office.

Kathy is an experienced and highly recommended dental hygienist who is also finishing up a D.degree in early childhood education, which she hopes will get her a job as a preschool teacher. She is eager to find a job in a pediatric practice, since she has always wanted to work with children.

Answer & Explanation

Answer: Option B

Explanation:

The situation described indicates that Dr. Miller's practice presents some specific challenges, namely that it is a busy environment with a child clientele. There is also some indication that even highly recommended, experienced hygienists might not be cut out for Dr. Miller's office. There is nothing to suggest that Marilyn (choice a) or James (choice c) would be a good fit for Dr. Miller's practice. Kathy (choice d) has experience and she is also interested in working with children. However, the fact that she hopes to become a preschool teacher in the not-too-distant future indicates that she might not be the kind of committed, long-term employee that Dr. Miller needs. Lindy (choice b), with her hands-on experience working with children as well as a degree from a prestigious dental hygiene program, is the most attractive candidate for the position based on the situation described

5. Mrs. Jansen recently moved to Arizona. She wants to fill her new backyard with flowering plants. Although she is an experienced gardener, she isn't very well-versed in what plants will do well in the Arizona climate. Also, there is a big tree in her backyard making for shady conditions and she isn't sure what plants will thrive without much direct sunlight. Her favorite gardening catalog offers several backyard seed packages. Which one should Mrs. Jansen choose?

A. The Rainbow Collection is ideal for North-east gardens. It includes a variety of colorful perennials that thrive in cool, moist conditions.

B. The Greenhouse Collection will blossom year after year if planted in brightly lit locations and watered regularly.

C. The Treehouse Collection will provide lush green plants with delicate colorful flowers that thrive in shady and partially shady locations.

D. The Oasis Collection includes a variety of perennials that thrive in dry climates and bright sunlight.

Answer & Explanation

Answer: Option C

Explanation:

The Treehouse Collection is the only package that can thrive in shady locations. Choice a requires a Northeastern climate. Choices b and d require bright sunlight.

COURSE OF ACTION

In each question below is given a statement followed by two courses of action numbered I and II. You have to assume everything in the statement to be true and on the basis of the information given in the statement, decide which of the suggested courses of action logically follow(s) for pursuing.

Give answer

- (A) If only I follows
- (B) If only II follows
- (C) If either I or II follows
- (D) If neither I nor II follows
- (E) If both I and II follow.

1.Statement: Most of those who study in premier engineering colleges in India migrate to developed nations for better prospects in their professional pursuits.

Courses of Action:

1. All the students joining these colleges should be asked to sign a bond at the time of admission to the effect that they will remain in India at least for ten years after they complete education.
2. All those students who desire to settle in the developed nations should be asked to pay entire cost of their education which the government subsidises.

A. Only I follows

B. Only II follows

C. Either I or II follows

D. Neither I nor II follows

E. Both I and II follow

Answer & Explanation

Answer: Option B

Explanation:

Clearly, no student can be bound to live and work in the country against his wish. So, I does not follow. However, it is quite right to recover the extra benefits awarded to students if they do not serve their own country. So, II follows.

2.Statement: There is an unprecedented increase in migration of villagers to urban areas as repeated crop failure has put them into precarious financial situation.

Courses of Action:

1. The villagers should be provided with alternate source of income in their villages which will make them stay put.
2. The migrated villagers should be provided with jobs in the urban areas to help them survive.

A. Only I follows

B. Only II follows

C. Either I or II follows

D. Neither I nor II follows

E. Both I and II follow

Answer & Explanation

Answer: Option A

Explanation:

Clearly, increased migration would add to the burden on city's infrastructure. So, attempts should be made to make the villagers feel comfortable in the villages itself. So, only course I follows.

3.Statement: As stated in the recent census report the female to male ratio is alarmingly low.

Courses of Action:

1. The government should conduct another census to verify the results.
2. The government should immediately issue orders to all the departments to encourage people to improve the ratio.

A. Only I follows

B. Only II follows

C. Either I or II follows

D. Neither I nor II follows

E. Both I and II follow

Answer & Explanation

Answer: Option B

Explanation:

A census is always conducted with the utmost precision, leaving chances of only negligible differences. So, I does not follow. Further, the ratio can be improved by creating awareness among the masses and abolishing female foeticide. Thus, only course II follows.

4.Statement: There is an unprecedented increase in migration of villagers to urban areas as repeated crop failure has put them into precarious financial situation.

Courses of Action:

1. The villagers should be provided with alternate source of income in their villages which will make them stay put.
2. The migrated villagers should be provided with jobs in the urban areas to help them survive.

A. Only I follows

B. Only II follows

C. Either I or II follows

D. Neither I nor II follows

E. Both I and II follow

Answer & Explanation

Answer: Option A

Explanation:

Clearly, increased migration would add to the burden on city's infrastructure. So, attempts should be made to make the villagers feel comfortable in the villages itself. So, only course I follows.

5.Statement: Four districts in State A have been experiencing severe drought for the last three years resulting into exodus of people from these districts.

Courses of Action:

1. The government should immediately start food for work programme in the district to put a halt to the exodus.
2. The government should make sincere efforts to provide drinking/potable water to these districts

A.Only I follows
B. Only II follows
C. Either I or II follows
D. Neither I nor II follows
E. Both I and II follow

Answer & Explanation

Answer: Option E

Explanation:

The exodus can be stopped by providing the people conditions conducive to living. So, both the courses follow.

6.Statement: If the retired Professors of the same Institutes are also invited to deliberate on restructuring of the organisation, their contribution may be beneficial to the Institute.

Courses of Action:

1. Management may seek opinion of the employees before calling retired professors.
2. Management should involve experienced people for the systematic restructuring of the organisation.

A.Only I follows
B. Only II follows
C. Either I or II follows
D. Neither I nor II follows
E. Both I and II follow

Answer & Explanation

Answer: Option B

Explanation:

Clearly, the statement stresses that the contribution of retired Professors shall be beneficial. This means that these people's experience regarding working of the organisation is helpful. So, only course II follows.

7.Statement: The sale of a particular product has gone down considerably causing great concern to the company.

Courses of Action:

1. The company should make a proper study of rival products in the market.

2. The price of the product should be reduced and quality improved.

A.Only I follows
B. Only II follows
C. Either I or II follows
D. Neither I nor II follows
E. Both I and II follow

Answer & Explanation

Answer: Option A

Explanation:

Clearly, a study of rival products in the market will help assess the cause for the lowering down of sales and then a suitable action can be taken. Thus, only I follow.

8. Statement: The Asian Development Bank has approved a \$285 million loan to finance a project to construct coal ports by Paradip and Madras Port Trusts.

Courses of Action:

1. India should use financial assistance from other international financial organisations to develop such ports in other places.
2. India should not seek such financial assistance from the international financial agencies.

A.Only I follows
B. Only II follows
C. Either I or II follows
D. Neither I nor II follows
E. Both I and II follow

Answer & Explanation

Answer: Option A

Explanation:

Clearly, such projects shall be an asset and a source of income to the country later on. So, course I shall follow.

9. Statement: Doordarshan is concerned about the quality of its programmes particularly in view of stiff competition it is facing from STAR and other satellite TV channels and is contemplating various measures to attract talent for its programmes.

Courses of Action:

1. In an effort to attract talent, the Doordarshan has decided to revise its fee structure for the artists.
2. The fee structure should not be revised until other electronic media also revise it.

A.Only I follows
B. Only II follows
C. Either I or II follows
D. Neither I nor II follows

E. Both I and II follow

Answer & Explanation

Answer: Option A

Explanation:

Clearly, the decision to revise its fee structure for artists is taken by Doordarshan as a remedy to the challenging problem that had arisen before it. It cannot wait till other media take action. So, only course I follows.

10. Statement: The Minister said that the teachers are still not familiarised with the need, importance and meaning of population education in the higher education system. They are not even clearly aware about their role and responsibilities in the population education programme.

Courses of Action:

1. Population education programme should be included in the college curriculum.
2. Orientation programme should be conducted for teachers on population education

A. Only I follows

B. Only II follows

C. Either I or II follows

D. Neither I nor II follows

E. Both I and II follow

Answer & Explanation

Answer: Option B

Explanation:

Clearly, the statement stresses on teachers' lack of awareness and knowledge in population education and as such the best remedy would be to guide them in this field through orientation programmes. So, only course II follows.

11. Statement: A recent study shows that children below five die in the cities of the developing countries mainly from diarrhoea and parasitic intestinal worms.

Courses of Action:

1. Governments of the developing countries should take adequate measures to improve the hygienic conditions in the cities.
2. Children below five years in the cities of the developing countries need to be kept under periodic medical check-up.

A. Only I follows

B. Only II follows

C. Either I or II follows

D. Neither I nor II follows

E. Both I and II follow

Answer & Explanation

Answer: Option E

Explanation:

Clearly, the two diseases mentioned are caused by unhygienic conditions. So, improving the hygienic conditions is a step towards their eradication. Also, periodic medical check-up will help timely detection of the disease and hence a proper treatment. So, both I and II follow.

12. Statement: The kharif crops have been affected by the insects for consecutive three years in the district and the farmers harvested less than fifty percent of produce during these years.

Courses of Action:

1. The farmers should seek measures to control the attack of insects to protect their crops next year.
2. The Government should increase the support price of kharif crops considerably to protect the economic interests of farmers.

A. Only I follows

B. Only II follows

C. Either I or II follows

D. Neither I nor II follows

E. Both I and II follow

Answer & Explanation

Answer: Option E

Explanation:

Clearly, the problem demands taking extra care and adequate precautions to protect crops from insects and extending help to farmers to prevent them from incurring huge losses. Thus, both the courses follow.

13. Statement: The car dealer found that there was a tremendous response for the new XYZ's car booking with long queues of people complaining about the duration of business hours and arrangements.

Courses of Action:

1. People should make their arrangement of lunch and snacks while going for car XYZ's booking and be ready to spend several hours.
2. Arrangement should be made for more booking desks and increased business hours to serve more people in less time.

A. Only I follows

B. Only II follows

C. Either I or II follows

D. Neither I nor II follows

E. Both I and II follow

Answer & Explanation

Answer: Option B

Explanation:

Seeing the tremendous response, the dealer must make suitable arrangements and deploy more personnel to take care of customers so that they don't have to wait excessively long for booking. So, only course II follows.

14. Statement: The State Government has decided to declare 'Kala Azar' as a notifiable disease under the Epidemics Act. Family members or neighbours of the patient are liable to be punished in case they did not inform the State authorities.

Courses of Action:

1. Efforts should be made to effectively implement the Act.
2. The cases of punishment should be propagated through mass media so that more people become aware of the stern actions.

- A. Only I follows
B. Only II follows
C. Either I or II follows
D. Neither I nor II follows

E. Both I and II follow
Answer & Explanation

Answer: Option E

Explanation:

The Act is aimed at eradication of the disease and so it needs to be proclaimed and promoted. So, both the courses follow.

15. Statement: The Chairman stressed the need for making education system more flexible and regretted that the curriculum has not been revised in keeping with the pace of the changes taking place.

Courses of Action:

1. Curriculum should be reviewed and revised periodically.
2. System of education should be made more flexible.

- A. Only I follows
B. Only II follows
C. Either I or II follows
D. Neither I nor II follows

E. Both I and II follow
Answer & Explanation

Answer: Option E

Explanation:

Clearly, the situation demands making the education system more flexible and changing it periodically according to the needs of the time. So, both the courses follow.

16. Statement: The Central Bureau of Investigation receives the complaint of an officer taking bribe to do the duty he is supposed to.

Courses of Action:

1. CBI should try to catch the officer red-handed and then take a strict action against

him.

2. CBI should wait for some more complaints about the officer to be sure about the matter.

- A. Only I follows
B. Only II follows
C. Either I or II follows
D. Neither I nor II follows
E. Both I and II follow

Answer & Explanation

Answer: Option A

Explanation:

Clearly, one complaint is enough for a wrong doing. This should be confirmed by catching the guilty red-handed and then strict action taken against him. So, only course I follows.

17. Statement: The Indian electronic component industry venturing into the West European markets faces tough competition from the Japanese.

Courses of Action:

1. India should search for other international markets for its products.
2. India should improve the quality of the electronic components to compete with the Japanese in capturing these markets.

- A. Only I follows
B. Only II follows
C. Either I or II follows
D. Neither I nor II follows
E. Both I and II follow

18. Statement: Orissa and Andhra Pradesh have agreed in principle to set up a joint control board for better control, management and productivity of several inter-state multipurpose projects.

Courses of Action:

1. Other neighbouring states should set up such control boards.
2. The proposed control board should not be allowed to function as such joint boards are always ineffective.

- A. Only I follows
B. Only II follows
C. Either I or II follows
D. Neither I nor II follows
E. Both I and II follow

Answer & Explanation

Answer: Option A

Explanation:

The effectiveness of such Control Boards is established by the fact that Orissa and A.P. have agreed to it for better control of its multipurpose projects. So, only course I follows.

19. Statement: The Government has decided not to provide financial support to voluntary organisations from next Five Year Plan and has communicated that all such organisations should raise funds to meet their financial needs.

Courses of Action:

1. Voluntary organisations should collaborate with foreign agencies.
2. They should explore other sources of financial support.

- A. Only I follows
B. Only II follows
C. Either I or II follows
D. Neither I nor II follows
E. Both I and II follow

Answer & Explanation

Answer: Option B

Explanation:

The problem arising is shortage of funds. So, alternative sources of financial support need to be worked out first. Thus, only course II follows.

20. Statement: The availability of imported fruits has increased in the indigenous market and so the demand for indigenous fruits has been decreased.

Courses of Action:

1. To help the indigenous producers of fruits, the Government should impose high import duty on these fruits, even if these are not of good quality.
2. The fruit vendors should stop selling imported fruits. So that the demand for indigenous fruits would be increased.

- A. Only I follows
B. Only II follows
C. Either I or II follows
D. Neither I nor II follows
E. Both I and II follow

Answer & Explanation

Answer: Option D

Explanation:

The ideas suggested in both I and II represent unfair means to cut competition. The correct way would be to devise methods and techniques such that the indigenous producers could produce better quality fruits and make them available in the market at prices comparable with those of the imported ones. Hence, neither I nor II follows.

CAUSE AND EFFECT

In each of the following questions, two statements numbered I and II are given. There may be cause and effect relationship between the two statements. These two statements may be the effect of the same cause or independent causes. These statements may be independent causes without having any relationship. Read both the statements in each question and mark your answer as

- (A) If statement I is the cause and statement II is its effect;
- (B) If statement II is the cause and statement I is its effect;
- (C) If both the statements I and II are independent causes;
- (D) If both the statements I and II are effects of independent causes; and
- (E) If both the statements I and II are effects of some common cause.

1. Statements:

1. There is unprecedented increase in the number of young unemployed in comparison to the previous year.
2. A large number of candidates submitted applications against an advertisement for the post of manager issued by a bank.

- A. Statement I is the cause and statement II is its effect
B. Statement II is the cause and statement I is its effect
C. Both the statements I and II are independent causes
D. Both the statements I and II are effects of independent causes
E. Both the statements I and II are effects of some common cause

Answer & Explanation

Answer: Option A

Explanation:

An increase in the number of unemployed youth is bound to draw in huge crowds for a single vacancy.

2. Statements:

1. The police authority has recently caught a group of house breakers.
2. The citizens group in the locality have started night vigil in the area.

- A. Statement I is the cause and statement II is its effect
B. Statement II is the cause and statement I is its effect
C. Both the statements I and II are independent causes
D. Both the statements I and II are effects of independent causes
E. Both the statements I and II are effects of some common cause

Answer & Explanation

Answer: Option E

Explanation:

Both the statements are clearly backed by a common cause, which is clearly an increase in the number of thefts in the locality.

3. Statements:

1. There is considerable reduction in the number of people affected by water-borne diseases in City A during this rainy season.
2. The government has opened four new civil hospitals in City A in the beginning of the year.

- A. Statement I is the cause and statement II is its effect
B. Statement II is the cause and statement I is its effect
C. Both the statements I and II are independent causes

- D. Both the statements I and II are effects of independent causes
E. Both the statements I and II are effects of some common cause

Answer & Explanation

Answer: Option C

Explanation:

The given statements are self-sufficient and depict independent events.

4. Statements:

1. The prices of vegetables have been increased considerably during this summer.
2. There is tremendous increase in the temperature during this summer thereby damaging crops greatly.

A. Statement I is the cause and statement II is its effect

B. Statement II is the cause and statement I is its effect

C. Both the statements I and II are independent causes

D. Both the statements I and II are effects of independent causes

E. Both the statements I and II are effects of some common cause

Answer & Explanation

Answer: Option B

Explanation:

Clearly, damage to crops due to high temperature may have resulted in a short supply of vegetables and hence an increase in their prices.

5. Statements:

1. Majority of the students in the college expressed their opinion against the college authority's decision to break away from the university and become autonomous.
2. The university authorities have expressed their inability to provide grants to its constituent colleges.

A. Statement I is the cause and statement II is its effect

B. Statement II is the cause and statement I is its effect

C. Both the statements I and II are independent causes

D. Both the statements I and II are effects of independent causes

E. Both the statements I and II are effects of some common cause

Answer & Explanation

Answer: Option B

Explanation:

Clearly, the university's decision to refuse grant to the colleges must have triggered the college authority to become autonomous.

6. Statements:

1. The literacy rate in the district has been increasing for the last four years.
2. The district administration has conducted extensive training programme for the workers involved in the literacy drive.

A. Statement I is the cause and statement II is its effect

B. Statement II is the cause and statement I is its effect

C. Both the statements I and II are independent causes

D. Both the statements I and II are effects of independent causes

- E. Both the statements I and II are effects of some common cause

Answer & Explanation

Answer: Option B

Explanation:

Clearly, the increase in the literacy rate may be attributed directly to the stringent efforts of the district administration in this direction.

7. Statements:

1. The school authority has asked the X Std. students to attend special classes to be conducted on Sundays.
2. The parents of the X Std. students have withdrawn their wards from attending private tuitions conducted on Sundays.

A. Statement I is the cause and statement II is its effect

B. Statement II is the cause and statement I is its effect

C. Both the statements I and II are independent causes

D. Both the statements I and II are effects of independent causes

E. Both the statements I and II are effects of some common cause

Answer & Explanation

Answer: Option A

Explanation:

It seems quite evident that the parents have instructed their wards to abstain from private tuitions on Sundays and attend special classes organised by the school.

8. Statements:

1. The Government has imported large quantities of sugar as per trade agreement with other countries.
2. The prices of sugar in the domestic market have fallen sharply in the recent months.

A. Statement I is the cause and statement II is its effect

B. Statement II is the cause and statement I is its effect

C. Both the statements I and II are independent causes

D. Both the statements I and II are effects of independent causes

E. Both the statements I and II are effects of some common cause

Answer & Explanation

Answer: Option A

Explanation:

The increase in supply always triggers a reduction in the prices.

9. Statements:

1. There is sharp decline in the production of oil seeds this year.
2. The Government has decided to increase the import quantum of edible oil.

A. Statement I is the cause and statement II is its effect

B. Statement II is the cause and statement I is its effect

C. Both the statements I and II are independent causes

D. Both the statements I and II are effects of independent causes

E. Both the statements I and II are effects of some common cause

Answer & Explanation

Answer: Option A

Explanation:

A sharp decline in oilseed production is bound to reduce oil supply and import of oil is the only means to restore the essential supply.

10. Statements:

1. The private medical colleges have increased the tuition fees in the current year by 200 per cent over the last year's fees to meet the expenses.
2. The Government medical colleges have not increased their fees in spite of price escalation.

A.Statement I is the cause and statement II is its effect

B.Statement II is the cause and statement I is its effect

C.Both the statements I and II are independent causes

D.Both the statements I and II are effects of independent causes

E. Both the statements I and II are effects of some common cause

Answer & Explanation

Answer: Option C

Explanation:

The increase in the fees of the private colleges and there being no increase in the same in Government colleges seem to be policy matters undertaken by the individual decisive boards at the two levels.

11. Statements:

1. Large number of people living in the low-lying areas has been evacuated during the last few days to safer places.
2. The Government has rushed in relief supplies to the people living in the affected areas.

A.Statement I is the cause and statement II is its effect

B.Statement II is the cause and statement I is its effect

C.Both the statements I and II are independent causes

D.Both the statements I and II are effects of independent causes

E. Both the statements I and II are effects of some common cause

Answer & Explanation

Answer: Option E

Explanation:

Evacuating low-lying areas and rushing in relief to the affected areas clearly indicates that floods have occurred in the area.

12. Statements:

1. It is the aim of the city's civic authority to get the air pollution reduced by 20% in the next two months.
2. The number of asthma cases in the city is constantly increasing.

A.Statement I is the cause and statement II is its effect

B. Statement II is the cause and statement I is its effect

C. Both the statements I and II are independent causes

D.Both the statements I and II are effects of independent causes

E. Both the statements I and II are effects of some common cause

Answer & Explanation

Answer: Option B

Explanation:

The increase in number of asthma cases must have alerted the authorities to take action to control air pollution that triggers the disease.

13. Statements:

1. The local co-operative credit society has decided to stop giving loans to farmers with immediate effect.
2. A large number of credit society members have withdrawn major part of their deposits from the credit society.

A.Statement I is the cause and statement II is its effect

B. Statement II is the cause and statement I is its effect

C. Both the statements I and II are independent causes

D.Both the statements I and II are effects of independent causes

E. Both the statements I and II are effects of some common cause

Answer & Explanation

Answer: Option B

Explanation:

Clearly, withdrawal of funds by society members is bound to reduce the lending power of the society.

14. Statements:

1. The employees of the biggest bank in the country have given an indefinite strike call starting from third of the next month.
2. The employees of the Central Government have withdrawn their week long demonstrations.

A.Statement I is the cause and statement II is its effect

B. Statement II is the cause and statement I is its effect

C. Both the statements I and II are independent causes

D.Both the statements I and II are effects of independent causes

E. Both the statements I and II are effects of some common cause

Answer & Explanation

Answer: Option D

Explanation:

The employees of a bank going on strike and the government employees calling off their

protest seem to be two independent events that might have been triggered by individual causes.

15. Statements:

1. Police resorted to lathi-charge to disperse the unlawful gathering of large number of people.
2. The citizens' forum called a general strike in protest against the police atrocities.

A.Statement I is the cause and statement II is its effect
B. Statement II is the cause and statement I is its effect
C. Both the statements I and II are independent causes
D.Both the statements I and II are effects of independent causes
E. Both the statements I and II are effects of some common cause

Answer & Explanation

Answer: Option A

Explanation:

Clearly, the people's mass protest against the police might have instigated the latter to indulge in lathi-charge to disperse the mob.

16. Statements:

1. Majority of the citizens in the locality belongs to higher income group.
2. The sales in the local super market are comparatively much higher than in other localities.

A.Statement I is the cause and statement II is its effect
B. Statement II is the cause and statement I is its effect
C. Both the statements I and II are independent causes
D.Both the statements I and II are effects of independent causes
E. Both the statements I and II are effects of some common cause

Answer & Explanation

Answer: Option B

Explanation:

The comparatively higher sales in a particular locality are indicative of the high paying capacity of the residents of that locality.

17. Statements:

1. The life today is too fast, demanding and full of variety in all aspects which at times leads to stressful situations.
2. Number of suicide cases among teenagers is on increase.

A.Statement I is the cause and statement II is its effect
B. Statement II is the cause and statement I is its effect

C. Both the statements I and II are independent causes
D.Both the statements I and II are effects of independent causes
E. Both the statements I and II are effects of some common cause

Answer & Explanation

Answer: Option A

Explanation:

Stress in everyday life is a major cause of frustration among the youth and is bound to lead them to take harsh steps as suicide.

18. Statements:

1. The government has decided to make all the information related to primary education available to the general public.
2. In the past, the general public did not have access to all these information related to primary education.

A.Statement I is the cause and statement II is its effect
B. Statement II is the cause and statement I is its effect
C. Both the statements I and II are independent causes
D.Both the statements I and II are effects of independent causes
E. Both the statements I and II are effects of some common cause

Answer & Explanation

Answer: Option B

Explanation:

The government must have seen the unawareness of the people as a strong factor in the primary education programme being not successful. The step indicated in I must, thus, have been sought for as a remedy for the same.

19. Statements:

1. The farmers have decided against selling their kharif crops to the Government agencies.
2. The Government has reduced the procurement price of kharif crops starting from last month to the next six months.

A.Statement I is the cause and statement II is its effect
B. Statement II is the cause and statement I is its effect
C. Both the statements I and II are independent causes
D.Both the statements I and II are effects of independent causes
E. Both the statements I and II are effects of some common cause

Answer & Explanation

Answer: Option B

Explanation:

The reduction in procurement price of crops must have instigated the farmers not to sell their produce to Government agencies.

20. Statements:

1. The performance of most of the students in final exam of class X in the schools run by the Government was excellent.

2. Many teachers of the Government schools left the school and joined private schools.

- A.Statement I is the cause and statement II is its effect
- B.Statement II is the cause and statement I is its effect
- C.Both the statements I and II are independent causes
- D.Both the statements I and II are effects of independent causes
- E. Both the statements I and II are effects of some common cause

Answer & Explanation

Answer: Option D

Explanation:

The students of government schools performing well in the examinations and the teachers of government schools leaving their jobs to join private schools are two separate situations that must have been triggered by independent causes.

STATEMENT AND CONCLUSION

In each question below is given a statement followed by two conclusions numbered I and II. You have to assume everything in the statement to be true, then consider the two conclusions together and decide which of them logically follows beyond a reasonable doubt from the information given in the statement.

Give answer:

- (A) If only conclusion I follows
- (B) If only conclusion II follows
- (C) If either I or II follows
- (D) If neither I nor II follows and
- (E) If both I and II follow.

1. **Statements:** In Japan, the incidence of stomach cancer is very high, while that of bowel cancer is very low. But Japanese immigrate to Hawaii, this is reversed - the rate of bowel cancer increases but the rate of stomach cancer is reduced in the next generation. All this is related to nutrition - the diets of Japanese in Hawaii are different than those in Japan.

Conclusions:

- 1. The same diet as in Hawaii should be propagated in Japan also.
- 2. Bowel cancer is less severe than stomach cancer.

- A.Only conclusion I follows
- B. Only conclusion II follows
- C.Either I or II follows
- D.Neither I nor II follows
- E. Both I and II follow

Answer & Explanation

Answer: Option D

Explanation:

The statement neither propagates the diet of any of the countries nor compares the two types of cancer. So, neither I nor II follows.

2. **Statements:** The Government run company had asked its employees to declare their income and assets but it has been strongly resisted by employees union and no employee is going to declare his income.

Conclusions:

- 1. The employees of this company do not seem to have any additional undisclosed income besides their salary.
- 2. The employees union wants all senior officers to declare their income first.

- A.Only conclusion I follows

- B. Only conclusion II follows

- C.Either I or II follows

- D.Neither I nor II follows

- E. Both I and II follow

Answer & Explanation

Answer: Option D

Explanation:

Nothing about the details of the employees' income or the cause of their refusal to declare their income and assets, can be deduced from the given statement. So, neither I nor II follows.

3. **Statements:** Monitoring has become an integral part in the planning of social development programmes. It is recommended that Management Information System be developed for all programmes. This is likely to give a feedback on the performance of the functionaries and the efficacy with which services are being delivered.

Conclusions:

- 1. All the social development programmes should be evaluated.
- 2. There is a need to monitor the performance of workers.

- A.Only conclusion I follows

- B. Only conclusion II follows

- C.Either I or II follows

- D.Neither I nor II follows

- E. Both I and II follow

Answer & Explanation

Answer: Option E

Explanation:

According to the statement, monitoring and evaluation of social development programmes - their function, performance and efficiency - is absolutely essential. So, both I and II follow.

4. **Statements:** The T.V. programmes, telecast specially for women are packed with a variety of recipes and household hints. A major portion of magazines for women also contains the items mentioned above.

Conclusions:

1. Women are not interested in other things.
2. An average woman's primary interest lies in home and specially in the kitchen.

- A. Only conclusion I follows
- B. Only conclusion II follows
- C. Either I or II follows
- D. Neither I nor II follows
- E. Both I and II follow

Answer & Explanation

Answer: Option B

Explanation:

Clearly, nothing about 'other things' is mentioned in the statement. So, I does not follow. Also, since it is mentioned that programmes and magazines for women are stuffed with kitchen recipes and other household hints, it means that women have special interest in these areas. So, II follows.

- 5. Statements:** The distance of 900 km by road between Bombay and Jafra will be reduced to 280 km by sea. This will lead to a saving of Rs. 7.92 crores per annum on fuel.

Conclusions:

1. Transportation by sea is cheaper than that by road.
2. Fuel must be saved to the greatest extent

- A. Only conclusion I follows
- B. Only conclusion II follows
- C. Either I or II follows
- D. Neither I nor II follows
- E. Both I and II follow

Answer & Explanation

Answer: Option B

Explanation:

According to the statement, sea transport is cheaper than road transport in the case of route from Bombay to Jafra, not in all the cases. So, conclusion I does not follow. The statement stresses on the saving of fuel. So, conclusion II follows.

- 6. Statements:** The manager humiliated Sachin in the presence of his colleagues.

Conclusions:

1. The manager did not like Sachin.
2. Sachin was not popular with his colleagues.

- A. Only conclusion I follows
- B. Only conclusion II follows
- C. Either I or II follows
- D. Neither I nor II follows
- E. Both I and II follow

Answer & Explanation

Answer: Option D

Explanation:

The manager might have humiliated Sachin not because of his dislike but on account of certain negligence or mistake on his part. So, I does not follow. Also, nothing about Sachin's rapport with his colleagues can be deduced from the statement. So, II also does not follow.

- 7. Statements:** Women's organisations in India have welcomed the amendment of the Industrial Employment Rules 1946 to curb sexual harassment at the work place.

Conclusions:

1. Sexual harassment of women at work place is more prevalent in India as compared to other developed countries.
2. Many organisations in India will stop recruiting women to avoid such problems.

- A. Only conclusion I follows
- B. Only conclusion II follows
- C. Either I or II follows
- D. Neither I nor II follows
- E. Both I and II follow

Answer & Explanation

Answer: Option D

Explanation:

The fact that a certain rule has been more welcomed in a certain country does not imply that the problem is more prevalent there. So, I does not follow. Also, the amendment seeks to discourage only sexual harassment of women and shall in no way discourage employment of women. So, II also does not follow.

- 8. Statements:** Nation X faced growing international opposition for its decision to explode eight nuclear weapons at its test site.

Conclusions:

1. The citizens of the nation favoured the decision.
2. Some powerful countries do not want other nations to become as powerful as they are.

- A. Only conclusion I follows
- B. Only conclusion II follows
- C. Either I or II follows
- D. Neither I nor II follows
- E. Both I and II follow

Answer & Explanation

Answer: Option D

Explanation:

Neither the citizens response to the decision nor the reason for opposition by other nations can be deduced from the statement. So, neither I nor II follows.

9. Statements: In a highly centralised power structure, in which even senior cabinet ministers are prepared to reduce themselves to pathetic countries or yesmen airing views that are primarily intended to anticipate or reflect the Prime Minister's own performances, there can be no place for any consensus that is quite different from real or contrived unanimity of opinion, expressed through a well orchestrated endorsement of the leader's actions.

Conclusions:

1. The Ministers play safe by not giving anti-government views.
2. The Prime Minister does not encourage his colleagues to render their own views.

- A. Only conclusion I follows
B. Only conclusion II follows
C. Either I or II follows
D. Neither I nor II follows
E. Both I and II follow
Answer & Explanation

Answer: Option A

Explanation:

According to the statement, even senior cabinet ministers are always ready to conform to the Prime Minister's views. So, I follows. However, II contradicts the given statement and so does not follow.

10. Statements: National Aluminium Company has moved India from a position of shortage to self-sufficiency in the metal.

Conclusions:

1. Previously, India had to import aluminium.
2. With this speed, it can soon become a foreign exchange earner.

- A. Only conclusion I follows
B. Only conclusion II follows
C. Either I or II follows
D. Neither I nor II follows
E. Both I and II follow
Answer & Explanation

Answer: Option E

Explanation:

According to the statement, National Aluminium Company has moved India from a position of shortage in the past to self-sufficiency in the present. This means that previously, India had to import aluminium. So, I follows. Also, it can be deduced that if production increases at the same rate, India can export it in future. So, II also follows.

11. Statements: Reading makes a full man, conference a ready man and writing an exact man.

Conclusions:

1. Pointed and precise expression comes only through extensive writing.
2. Extensive reading makes a complete man.

- A. Only conclusion I follows
B. Only conclusion II follows
C. Either I or II follows
D. Neither I nor II follows
E. Both I and II follow

Answer & Explanation

Answer: Option E

Explanation:

Clearly, I follows from the fact that writing makes an exact man. Conclusion II also directly follows from the statement.

12. Statements: Jade plant has thick leaves and it requires little water.

Conclusions:

1. All plants with thick leaves require little water.
2. Jade plants may be grown in places where water is not in abundance.

- A. Only conclusion I follows
B. Only conclusion II follows
C. Either I or II follows
D. Neither I nor II follows
E. Both I and II follow

Answer & Explanation

Answer: Option B

Explanation:

The statement talks of jade plants only and not 'all plants with thick leaves'. So, I does not follow. Also, since jade plants require little water, so they can be grown in places where water is not in abundance. So, II follows.

13. Statements: Use "Kraft" colours. They add colour to our life. - An advertisement.

Conclusions:

1. Catchy slogans do not attract people.
2. People like dark colours.

- A. Only conclusion I follows
B. Only conclusion II follows
C. Either I or II follows
D. Neither I nor II follows
E. Both I and II follow

Answer & Explanation

Answer: Option D

Explanation:

The slogan given in the statement is definitely a catchy one which indicates that catchy slogans do attract people. So, I does not follow. Nothing about people's preference for colours

can be deduced from the statement. Thus, II also does not follow.

14. **Statements:** All those political prisoners were released on bail who had gone to jail for reasons other than political dharnas. Bail was not granted to persons involved in murders.

Conclusions:

1. No political - prisoner had committed murder.
2. Some politicians were not arrested.

A. Only conclusion I follows

B. Only conclusion II follows

C. Either I or II follows

D. Neither I nor II follows

E. Both I and II follow

Answer & Explanation

Answer: Option A

Explanation:

According to the statement, the political prisoners can be divided into two groups - those who were released and those who were put in jail for political dharnas. However, no person involved in murder was released. This means that no political prisoner had committed murder. So, I follows. Clearly, II is not directly related to the statement and does not follow.

15. **Statements:** Modern man influences his destiny by the choice he makes unlike in the past.

Conclusions:

1. Earlier there were fewer options available to man.
2. There was no desire in the past to influence the destiny.

A. Only conclusion I follows

B. Only conclusion II follows

C. Either I or II follows

D. Neither I nor II follows

E. Both I and II follow

Answer & Explanation

Answer: Option A

Explanation:

Clearly, I directly follows from the statement while II cannot be deduced from it.

16. **Statements:** Water supply in wards A and B of the city will be affected by about 50% on Friday because repairing work of the main lines is to be carried out.

Conclusions:

1. The residents in these wards should economise on water on Friday.
2. The residents in these wards should store some water on the previous day.

A. Only conclusion I follows

B. Only conclusion II follows

C. Either I or II follows

D. Neither I nor II follows

E. Both I and II follow

Answer & Explanation

Answer: Option E

Explanation:

Clearly, the information has been given beforehand so that the residents can collect water on the previous day and use less water on Friday. So, both I and II follow.

17. **Statements:** People who speak too much against dowry are those who had taken it themselves.

Conclusions:

1. It is easier said than done.
2. People have double standards.

A. Only conclusion I follows

B. Only conclusion II follows

C. Either I or II follows

D. Neither I nor II follows

E. Both I and II follow

Answer & Explanation

Answer: Option E

Explanation:

The statement clearly implies that it is easier to say than to do something and what people say is different from what they do. So, both I and II follow.

18. **Statements:** The national norm is 100 beds per thousand populations but in this state, 150 beds per thousand are available in the hospitals.

Conclusions:

1. Our national norm is appropriate.
2. The state's health system is taking adequate care in this regard.

A. Only conclusion I follows

B. Only conclusion II follows

C. Either I or II follows

D. Neither I nor II follows

E. Both I and II follow

Answer & Explanation

Answer: Option B

Explanation:

Whether the national norm is appropriate or not cannot be said. So, I does not follow. However, more number of beds per thousand population are available in the state. So, II follows.

19. **Statements:** Our securities investments carry market risk. Consult your investment advisor or agent before investing.

Conclusions:

1. One should not invest in securities.
2. The investment advisor calculates the market risk with certainty.

A. Only conclusion I follows

B. Only conclusion II follows

C. Either I or II follows

D. Neither I nor II follows

E. Both I and II follow

Answer & Explanation

Answer: Option B

Explanation:

Investment in securities involves risk. This does not mean that one should not invest in securities. So, I does not follow. Since the statement advises one to consult investment advisor before investing, so II follows.

20. **Statements:** Money plays a vital role in politics.

Conclusions:

1. The poor can never become politicians.
2. All the rich men take part in politics.

A. Only conclusion I follows

B. Only conclusion II follows

C. Either I or II follows

D. Neither I nor II follows

E. Both I and II follow

Answer & Explanation

Answer: Option D

Explanation:

Neither the poor nor the rich, but only the role of money in politics is being talked about in the statement. So, neither I nor II follows.

STATEMENT AND ARGUMENT

Each question given below consists of a statement, followed by two arguments numbered I and II. You have to decide which of the arguments is a 'strong' argument and which is a 'weak' argument.

Give answer:

- (A) If only argument I is strong
- (B) If only argument II is strong
- (C) If either I or II is strong

- (D) If neither I nor II is strong and
- (E) If both I and II are strong.

1. **Statement:** Should cottage industries be encouraged in rural areas?

Arguments:

1. Yes. Rural people are creative.
2. Yes. This would help to solve the problem of unemployment to some extent.

A. Only argument I is strong

B. Only argument II is strong

C. Either I or II is strong

D. Neither I nor II is strong

E. Both I and II are strong

Answer & Explanation

Answer: Option B

Explanation:

Clearly, cottage industries need to be promoted to create more job opportunities for rural people in the villages themselves. The reason that rural people are creative is vague. So, only argument II holds.

2. **Statement:** Should young entrepreneurs be encouraged?

Arguments:

1. Yes. They will help in industrial development of the country.
2. Yes. They will reduce the burden on employment market.

A. Only argument I is strong

B. Only argument II is strong

C. Either I or II is strong

D. Neither I nor II is strong

E. Both I and II are strong

Answer & Explanation

Answer: Option E

Explanation:

Clearly, encouraging the young entrepreneurs will open up the field for the establishment of new industries. Thus, it shall help in industrial development and not only employ the entrepreneurs but create more job opportunities for others as well. So, both the arguments hold strong.

3. **Statement:** Should all the annual examinations up to Std. V be abolished?

Arguments:

1. Yes. The young students should not be burdened with such examinations which hampers their natural growth.
2. No. The students will not study seriously as they will get automatic promotion to the next class and this will affect them in future.

- A. Only argument I is strong
- B. Only argument II is strong
- C. Either I or II is strong
- D. Neither I nor II is strong
- E. Both I and II are strong

Answer & Explanation

Answer: Option E

Explanation:

Clearly, neither the students can be burdened with studies at such a tender age, nor can they be left free to take studies casually, as this shall weaken their basic foundation. So, both the arguments follow.

4. Statement: Should Indian scientists working abroad be called back to India?

Arguments:

- 1. Yes. They must serve the motherland first and forget about discoveries, honours, facilities and all.
- 2. No. We have enough talent; let them stay where they want.

- A. Only argument I is strong
- B. Only argument II is strong
- C. Either I or II is strong
- D. Neither I nor II is strong
- E. Both I and II are strong

Answer & Explanation

Answer: Option D

Explanation:

Clearly, every person must be free to work wherever he wants and no compulsion should be made to confine one to one's own country. So, argument I is vague. However, talented scientists can be of great benefit to the nation and some alternatives as special incentives or better prospects may be made available to them to retain them within their motherland. So, argument II also does not hold.

5. Statement: Should we scrap the system of formal education beyond graduation?

Arguments:

- 1. Yes. It will mean taking employment at an early date.
- 2. No. It will mean lack of depth of knowledge.

- A. Only argument I is strong
- B. Only argument II is strong
- C. Either I or II is strong
- D. Neither I nor II is strong
- E. Both I and II are strong

Answer & Explanation

Answer: Option B

Explanation:

Clearly, argument I is vague because at present too, many fields are open to all after graduation. However, eliminating the post-graduate courses would abolish higher and specialized studies which lead to understanding things better and deeply. So, argument II is valid.

6. Statement: Should there be an upper age limit of 65 years for contesting Parliamentary/Legislative Assembly elections?

Arguments:

- 1. Yes. Generally, people above the age of 65 lose their dynamism and will power.
- 2. No. The life span is so increased that people remain physically and mentally active even up to the age of 80.

- A. Only argument I is strong
- B. Only argument II is strong
- C. Either I or II is strong
- D. Neither I nor II is strong
- E. Both I and II are strong

Answer & Explanation

Answer: Option D

Explanation:

The age of a person is no criterion for judging his mental capabilities and administrative qualities. So, none of the arguments holds strong.

7. Statement: Should new big industries be started in Mumbai?

Arguments:

- 1. Yes. It will create job opportunities.
- 2. No. It will further add to the pollution of the city.

- A. Only argument I is strong
- B. Only argument II is strong
- C. Either I or II is strong
- D. Neither I nor II is strong
- E. Both I and II are strong

Answer & Explanation

Answer: Option C

Explanation:

Opening up of new industries is advantageous in opening more employment avenues, and disadvantageous in that it adds to the pollution. So, either of the arguments holds strong.

8. Statement: Should high chimneys be installed in industries?

Arguments:

- 1. Yes. It reduces pollution at ground level.

2. No. It increases pollution in upper atmosphere.
- A. Only argument I is strong
B. Only argument II is strong
C. Either I or II is strong
D. Neither I nor II is strong
E. Both I and II are strong

Answer & Explanation

Answer: Option A

Explanation:

Pollution at ground level is the most hazardous in the way of being injurious to human and animal life. So, argument I alone holds.

9. Statement: Does India need so many plans for development?

Arguments:

1. Yes. Nothing can be achieved without proper planning.
2. No. Too much time, money and energy is wasted on planning.

- A. Only argument I is strong
B. Only argument II is strong
C. Either I or II is strong
D. Neither I nor II is strong
E. Both I and II are strong

Answer & Explanation

Answer: Option A

Explanation:

Before indulging in new development programme it is much necessary to plan the exact target, policies and their implementation and the allocation of funds which shows the right direction to work. So, argument I holds strong. Also, planning ensures full utilization of available resources and funds and stepwise approach towards the target. So, spending a part of money on it is no wastage. Thus, argument II is not valid.

10. Statement: Should articles of only deserving authors be allowed to be published?

Arguments:

1. Yes. It will save a lot of paper which is in short supply.
2. No. It is not possible to draw a line between the deserving and the undeserving.

- A. Only argument I is strong
B. Only argument II is strong
C. Either I or II is strong
D. Neither I nor II is strong
E. Both I and II are strong

Answer & Explanation

Answer: Option B

Explanation:

Clearly, I does not provide a strong reason in support of the statement. Also, it is not possible to analyze the really deserving and not deserving. So/argument II holds strong.

11. Statement: Should colleges be given the status of a university in India?

Arguments:

1. Yes. Colleges are in a better position to assess the student's performance and therefore the degrees will be more valid.
2. No. It is Utopian to think that there will not be nepotism and corruption in awarding degrees by colleges.

- A. Only argument I is strong
B. Only argument II is strong
C. Either I or II is strong
D. Neither I nor II is strong
E. Both I and II are strong

Answer & Explanation

Answer: Option D

Explanation:

Clearly, at the college level, all the students are assessed according to their performance in the University Exams and not on the basis of any criteria of a more intimate dealings with the students. So, argument I is vague. Also, at this level the awarding of degrees is impartial and simply based on his performance. So, argument II also does not hold.

12. Statement: Should the prestigious people who have committed crime unknowingly, be met with special treatment?

Arguments:

1. Yes. The prestigious people do not commit crime intentionally.
2. No. It is our policy that everybody is equal before the law.

- A. Only argument I is strong
B. Only argument II is strong
C. Either I or II is strong
D. Neither I nor II is strong
E. Both I and II are strong

Answer & Explanation

Answer: Option B

Explanation:

The Constitution of India has laid down the doctrine of 'equality before the law'. So, argument II holds strong. Also, we cannot judge the intentions of a person behind committing a crime, So, argument I is vague.

13. Statement: Can pollution be controlled?

Arguments:

1. Yes. If everyone realizes the hazards it may create and cooperates to get rid of it, pollution may be controlled.
2. No. The crowded highways, factories and industries and an ever-growing population eager to acquire more and more land for constructing houses are beyond control.

- A. Only argument I is strong
B. Only argument II is strong
C. Either I or II is strong
D. Neither I nor II is strong
E. Both I and II are strong

Answer & Explanation

Answer: Option C

Explanation:

The control of pollution, on one hand, seems to be impossible because of the ever-growing needs and the disconcert of the people but, on the other hand, the control is possible by a joint effort. So, either of the arguments will hold strong.

- 14. Statement:** Should the railways in India be privatized in a phased manner like other public sector enterprises?

Arguments:

1. Yes. This is the only way to bring in competitiveness and provide better services to the public.
2. No. This will pose a threat to the national security of our country as multinationals will enter into the fray.

- A. Only argument I is strong
B. Only argument II is strong
C. Either I or II is strong
D. Neither I nor II is strong
E. Both I and II are strong

Answer & Explanation

Answer: Option D

Explanation:

Privatization would no doubt lead to better services. But saying that this is the 'only way' is wrong. So, argument I does not hold. Argument II also seems to be vague.

- 15. Statement:** Should internal assessment in colleges be abolished?

Arguments:

1. Yes. This will help in reducing the possibility of favouritism.
2. No, teaching faculty will lose control over students.

- A. Only argument I is strong
B. Only argument II is strong
C. Either I or II is strong

- D. Neither I nor II is strong
E. Both I and II are strong

Answer & Explanation

Answer: Option A

Explanation:

Abolishing the internal assessment would surely reduce favouritism on personal grounds because the teachers would not be involved in examination system so that they cannot extend personal benefits to anyone. So, argument I holds strong. But it will not affect the control of teaching faculty on students because still the teachers would be teaching them. So, argument II is vague.

- 16. Statement:** Should all the unauthorized structures in the city be demolished?

Arguments:

1. No. Where will the people residing in such houses live?
2. Yes. This will give a clear message to general public and they will refrain from constructing unauthorized buildings.

- A. Only argument I is strong
B. Only argument II is strong
C. Either I or II is strong
D. Neither I nor II is strong
E. Both I and II are strong

Answer & Explanation

Answer: Option B

Explanation:

The demolition of unauthorized buildings would teach a lesson to the unscrupulous builders and also serve as a warning for the citizens not to indulge in such activities in the future. This is essential, as unauthorized constructions impose undue burden on the city's infrastructure. So, only argument II holds strong.

- 17. Statement:** Should there be a maximum limit for the number of ministers in the Central Government?

Arguments:

1. No. The political party in power should have the freedom to decide the number of ministers to be appointed.
2. Yes. The number of ministers should be restricted to a certain percentage of the total number of seats in the parliament to avoid unnecessary expenditure.

- A. Only argument I is strong
B. Only argument II is strong
C. Either I or II is strong
D. Neither I nor II is strong
E. Both I and II are strong

Answer & Explanation

Answer: Option B

Explanation:

Clearly, there should be some norms regarding the number of ministers in the Government, as more number of ministers would unnecessarily add to the Government expenditure. So, argument II holds strong; Also, giving liberty to the party in power could promote extension of unreasonable favour to some people at the cost of government funds. So, argument I does not hold.

18. Statement: Should foreign films be banned in India?

Arguments:

1. Yes. They depict an alien culture which adversely affects our values.
2. No. Foreign films are of a high artistic standard.

- A. Only argument I is strong
- B. Only argument II is strong
- C. Either I or II is strong
- D. Neither I nor II is strong
- E. Both I and II are strong

Answer & Explanation

Answer: Option D

Explanation:

Clearly, foreign films depict the alien culture but this only helps in learning more. So, argument I does not hold. Also, the reason stated in argument II is not strong enough in contradicting the ban. So, it also does not hold.

19. Statement: Is buying things on instalments profitable to the customer?

Arguments:

1. Yes. He has to pay less.
2. No, paying instalments upsets the family budget.

- A. Only argument I is strong
- B. Only argument II is strong
- C. Either I or II is strong
- D. Neither I nor II is strong
- E. Both I and II are strong

Answer & Explanation

Answer: Option D

Explanation:

In buying things on instalments, a customer has to pay more as the interest is also included. So, argument I does not hold. Moreover, one who buys an item on instalments maintains his future budget accordingly as he is well acquainted with when and how much he has to pay, beforehand. So, argument II is also not valid.

20. Statement: Should Doordarshan be given autonomous status?

Arguments:

1. Yes. It will help Doordarshan to have fair and impartial coverage of all important events.
2. No. The coverage of events will be decided by a few who may not have healthy outlook.

- A. Only argument I is strong
- B. Only argument II is strong
- C. Either I or II is strong
- D. Neither I nor II is strong
- E. Both I and II are strong

Answer & Explanation

Answer: Option A

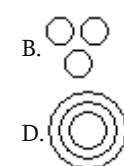
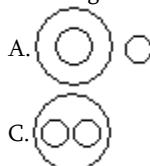
Explanation:

Clearly, the autonomous status of the Doordarshan will be a step towards giving it independence for an impartial coverage. Autonomous status does not mean that the coverage will be decided by a few. So, only argument I holds.

CREATIVITY APTITUDE

VENN DIAGRAM ANSWERS

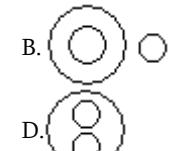
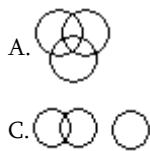
1. Which of the following diagrams indicates the best relation between Author, Lawyer and Singer ?



Answer: Option B

Solution: All the three are different professions.

2. Which of the following diagrams indicates the best relation between Judge, Thieves and Criminals ?



Answer: Option B

All the thieves are criminals while judge is different from these.

3. Which of the following diagrams indicates the best relation between Iron, Lead and Nitrogen ?



Answer: Option **B**

All these three elements are different from each other

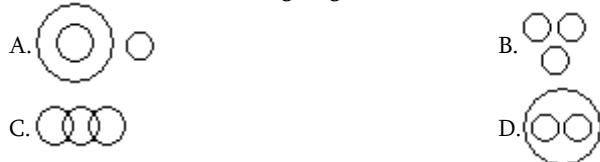
4. Which of the following diagrams indicates the best relation between Pigeon, Bird and Dog ?



Answer: option **A**

All the pigeons are birds while dog is different from these.

5. Which of the following diagrams indicates the best relation between Earth, Sea and Sun ?



Option **A**

Sea is a part of Earth while Sun is different from these two.

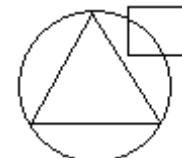
6. Which of the following diagrams indicates the best relation between Hockey, Football and Cricket ?



Ans: opt b

All these three games are different from each other.

7. In an organization of pollution control board, engineers are represented by a circle, legal experts by a square and environmentalist by a triangle. Who is most represented in the board as shown in the following figure ?



A. Environmentalists

B. Legal Experts

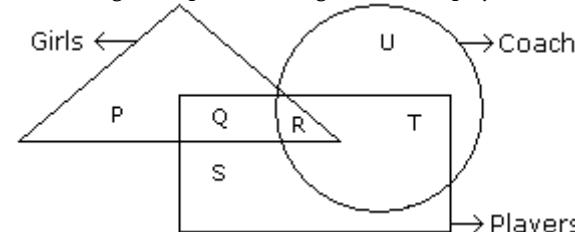
C. Engineers with legal background

D. Environmentalists with Engineering background

Ans: opt d

Environmentalists with Engineering background is most represented in the board.

8. In the following figure triangle represents 'girls', square players and circle-coach. Which part of the diagram represents the girls who are player but not coach?



A.P

C.R

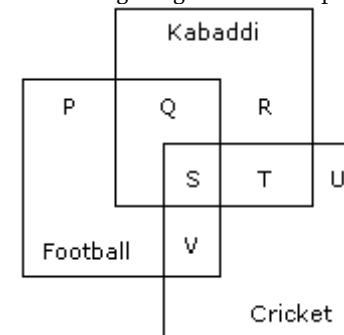
B.Q

D.S

Ans: Option B

part of the figure represents those girls who are players but not coach.

9. The diagram given below represents those students who play Cricket, Football and Kabaddi.



Study the diagram and identify the students who play all the three games.

A.P + Q + R

B.V + T

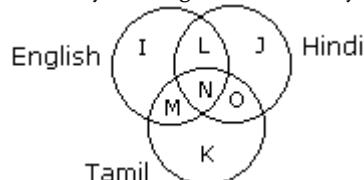
C.S + T + V

D.S

Ans: Option D

S indicates those students who play all three games.

10. Study the diagram and identify the people who can speak only one language.



A. $L + M + O$

C. K

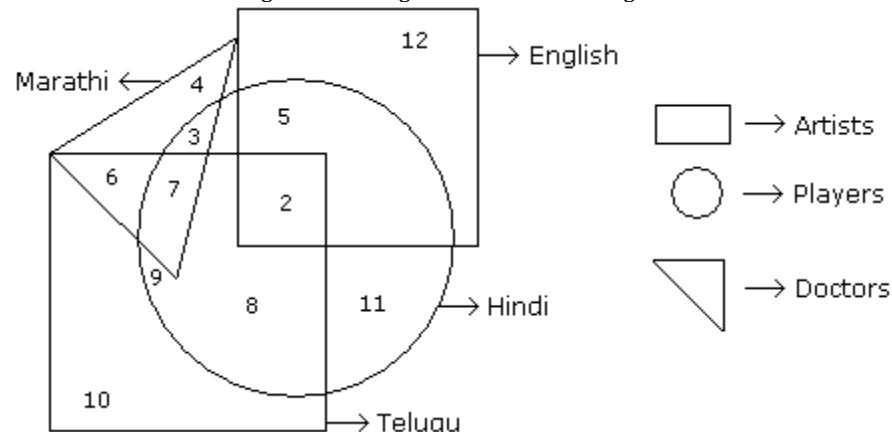
Ans: Option **B**

The regions represented by the letters K, J and I denote such people who can speak only one language.

B. $K + J + I$

D. I

11. In the following figure small square represents the persons who know English, triangle to those who know Marathi, big square to those who know Telugu and circle to those who know Hindi. In the different regions of the figures from 1 to 12 are given.



1. How many persons can speak English and Hindi both the languages only ?

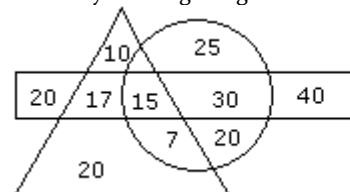
A. 5

C. 7

Ans: Option **A**

Number of persons who can speak English and Hindi both only is 5.

12. Study the diagram given below and answer each of the following questions.



→ Persons who takes tea



→ Persons who takes coffee



→ Persons who takes wine

A. How many persons who take tea and wine but not coffee ?

A. 20

C. 25

B. 17

D. 15

Ans: Option **B**

17 persons take tea and wine but not coffee.

12.B. How many persons are there who take both tea and coffee but not wine ?

A. 22

B. 17

C. 7

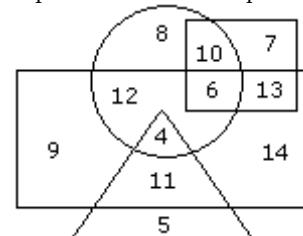
D. 20

Ans: **Answer:** Option **C**

Explanation:

Number of persons was taken both tea and coffee but not wine is 7.

13.a. In the following diagram rectangle represents men, Triangle represents educated, Circle represents urban and square represents government employees.



1. Which one of the following represents the educated men but not urban ?

A. 9

B. 5

C. 4

D. 11

OptionD

13.b. Which one of the following represents a woman who is urban as well as government employee ?

A. 7

B. 13

C. 10

D. 6

Ans: Option **C**

Why women are not mentioned in the diagram?

Ans: Rectangle represents men, therefore the area outside the rectangle should be WOMEN.

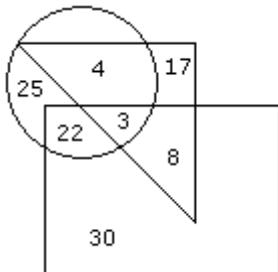
How to find the answer for the this question?

Ans = [Woman & Urban & Government Employee]

Conditions: Outside the rectangle(women) & Circle(urban) & Square(Govt. employee)

From the given diagram we can find that the value 10 satisfies the above conditions.

14.a..



- Artists
- Players
- Doctors

1. How many doctors are neither artists nor players ?

- | | |
|------|------|
| A.17 | B.5 |
| C.10 | D.30 |

Option A

The number of doctors who are neither artists nor players is 17.

14.b.

How many doctors are both players and artists ?

- | | |
|------|------|
| A.22 | B.8 |
| C.3 | D.30 |

Option C

The number of doctors who are both players and artists is 3.

CUBE AND CUBOIDS

The following questions are based on the information given below:

1. There is a cuboid whose dimensions are $4 \times 3 \times 3$ cm.
2. The opposite faces of dimensions 4×3 are coloured yellow.
3. The opposite faces of other dimensions 4×3 are coloured red.
4. The opposite faces of dimensions 3×3 are coloured green.
5. Now the cuboid is cut into small cubes of side 1 cm.

1.A

How many small cubes will have only two faces coloured ?

- | | |
|------|------|
| A.12 | B.24 |
| C.16 | D.12 |

Option C

Number of small cubes having only two faces coloured = 6 from the front + 6 from the back + 2 from the left + 2 from the right= 16

1.B.

How many small cubes have three faces coloured ?

- | | |
|------|------|
| A.24 | B.20 |
| C.16 | D.8 |

Option D

Such cubes are related to the corners of the cuboid and there are 8 corners.

Hence, the required number is 8.

1.C.

How many small cubes will have no face coloured ?

- | | |
|-----|-----|
| A.1 | B.2 |
| C.4 | D.8 |

Option B

Number of small cubes have no face coloured = $(4 - 2) \times (3 - 2) = 2 \times 1 = 2$

1.D.

How many small cubes will have only one face coloured ?

- | | |
|------|------|
| A.10 | B.12 |
| C.14 | D.18 |

Option A

Number of small cubes having only one face coloured = $2 \times 2 + 2 \times 2 + 2 \times 1$

$$= 4 + 4 + 2 \\ = 10$$

2. The following questions are based on the information given below:

1. A cuboid shaped wooden block has 4 cm length, 3 cm breadth and 5 cm height.
 2. Two sides measuring $5 \text{ cm} \times 4 \text{ cm}$ are coloured in red.
 3. Two faces measuring $4 \text{ cm} \times 3 \text{ cm}$ are coloured in blue.
 4. Two faces measuring $5 \text{ cm} \times 3 \text{ cm}$ are coloured in green.
 5. Now the block is divided into small cubes of side 1 cm each.
1. How many small cubes will have will have three faces coloured ?
- | | |
|------|------|
| A.14 | B.8 |
| C.10 | D.12 |
- Option B
- Such cubes are related to the corners of the cuboid and in the cuboid there are 8 corners. Hence, the required number of small cubes is 8.
2. How many small cubes will have only one face coloured ?
- | | |
|------|------|
| A.12 | B.28 |
| C.22 | D.16 |

Option C

2 from the front + 2 from the back + 3 from the left + 3 from the right + 6 from the top + 6 from the bottom = 22

3. How many small cubes will have no faces coloured ?

- | | |
|--------|-----|
| A.None | B.2 |
| C.4 | D.6 |

Option D

Required number of small cubes = $(5 - 2) \times (4 - 2) \times (3 - 2)$

$$= 3 \times 2 \times 1$$

$$= 6$$

4. How many small cubes will have two faces coloured with red and green colours ?

- | | |
|------|------|
| A.12 | B.8 |
| C.16 | D.20 |

Option A

Required number of small cubes = 6 from the top and 6 from the bottom = 12

3. The following questions are based on the information given below:

1. All the faces of cubes are painted with red colour.
2. The cubes is cut into 64 equal small cubes.

1. How many small cubes have only one face coloured ?

- | | |
|------|------|
| A.4 | B.8 |
| C.16 | D.24 |

Option D

Number of small cubes having only one face coloured = $(x - 2)^2 \times \text{No. of faces}$

$$= (4 - 2)^2 \times 6$$

$$= 24$$

2. How many small cubes have no faces coloured ?

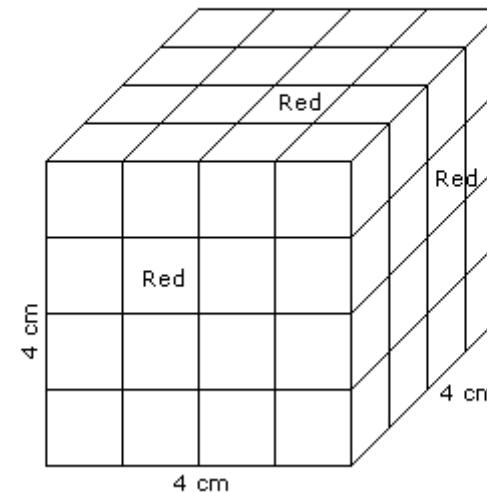
- | | |
|------|-----|
| A.24 | B.8 |
| C.16 | D.0 |

Option B

Explanation:

There are 64 small cubes.

Hence one side of the big cube = $\sqrt[3]{64} = 4 \text{ cm.}$



Number of small cubes having only one faces coloured = $(x - 2)^3$

Here, x = side of big cube / side of small cube

$$x = 4 / 1$$

$$x = 4$$

$$\text{Required number} = (4 - 2)^3$$

$$= 8$$

3. How many small cubes are there whose three faces are coloured ?

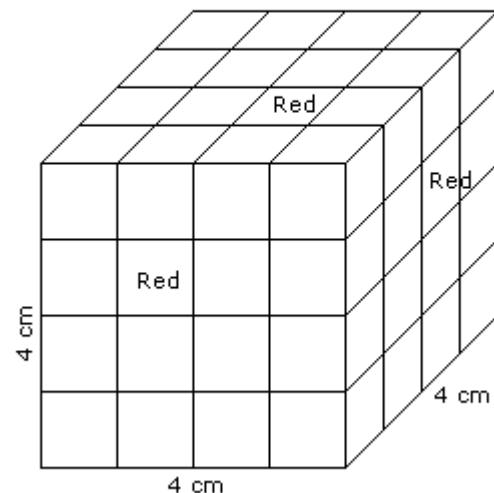
- | | |
|------|------|
| A.4 | B.8 |
| C.16 | D.24 |

Option B

Explanation:

There are 64 small cubes.

Hence one side of the big cube = $\sqrt[3]{64} = 4 \text{ cm}$.



Number of small cubes having three faces coloured = No. of corners = 8

4. How many small cubes are there whose two adjacent faces are coloured red ?

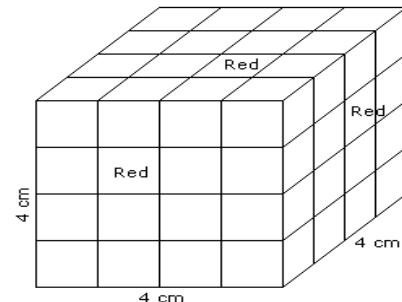
- | | |
|------|------|
| A.0 | B.8 |
| C.16 | D.24 |

Answer: Option D

Explanation:

There are 64 small cubes.

Hence one side of the big cube = $\sqrt[3]{64} = 4 \text{ cm}$.



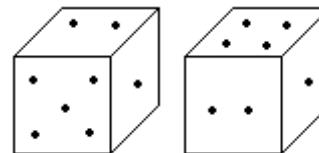
Number of small cubes having two adjacent faces coloured red = $(x - 2) \times \text{No. of edges}$

$$= (4 - 2) \times 12$$

$$= 24$$

DICE

1.Two positions of dice are shown below. How many points will appear on the opposite to the face containing 5 points?



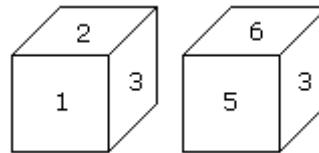
- | | |
|-----|-----|
| A.3 | B.1 |
| C.2 | D.4 |

Answer: Option D

Explanation:

In these two positions one of the common face having 1 point is in the same position. Therefore according to rule (2). There will be 4 points on the required face.

2.Which digit will appear on the face opposite to the face with number 4?



- | | |
|-----|-------|
| A.3 | B.5 |
| C.6 | D.2/3 |

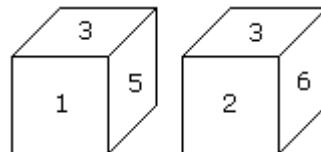
Answer: Option A

Explanation:

Here the common faces with number 3, are in same positions. Hence 6 is opposite to 2 and 5 is opposite to 1. Therefore 4 is opposite to 3.

3.

Two positions of a dice are shown below. Which number will appear on the face opposite to the face with the number 5?



- | | |
|-------|-----|
| A.2/6 | B.2 |
| C.6 | D.4 |

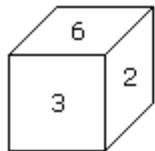
Answer: Option C

Explanation:

According to the rule no. (3), common faces with number 3, are in same positions. Hence the number of the opposite face to face with number 5 will be 6.

4.

Which number is on the face opposite to 6?



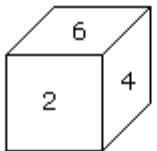
A.4

C.2

Answer: Option B

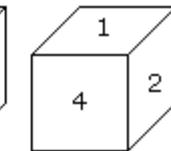
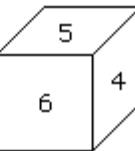
Explanation:

As the numbers 2, 3, 4 and 5 are adjacent to 6. Hence the number on the face opposite to 6 is 1. 5.

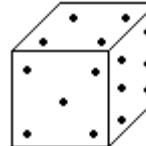


B.1

D.3



Here two positions of dice are shown. If there are two dots in the bottom, then how many dots will be on the top?



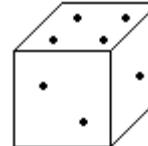
A.2

C.5

Answer: Option C

Explanation:

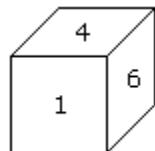
Here the common faces with 4 dots are in same positions. Hence 2 will be opposite to 5.



B.3

D.6

Two positions of a dice are shown below. When number '1' is on the top. What number will be at the bottom?

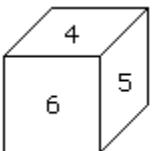


A.3

C.2

Answer: Option B

Explanation:



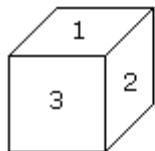
B.5

D.6

According to the rule (2) when 'one' is at the top, then 5 will be at the bottom.

6.

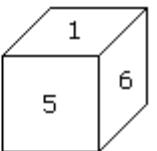
Two positions of a cube with its surfaces numbered are shown below. When the surface 4 touch the bottom, what surface will be on the top?



A.1

C.5

Answer: Option A



B.2

D.6

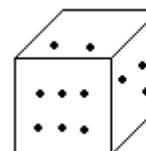
Explanation:

In these 2 positions one common face with number 1 is in the same position. Hence according to the rule number (3), 2 is opposite 6 and 3 is opposite to 5. Therefore opposite to 4 is 1.

7.

8.

Two positions of dice are shown below. How many points will be on the top when 2 points are at the bottom?

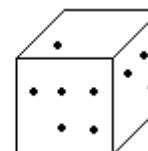


A.6

C.4

Answer: Option D

Explanation:



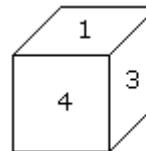
B.5

D.1

In these 2 positions of a dice, one common face having points 3 is in the same position. Hence according to rule (3), there will be 4 points on the required face.

9.

Two positions of a cubical block are shown. When 5 is at the top which number will be at bottom?

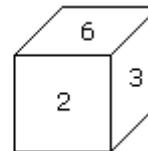


A.1

C.3

Answer: Option C

Explanation:



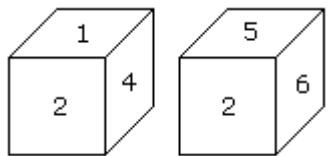
B.2

D.4

In these 2 positions one common face with number 3, is in same position. Hence according to rule (3), 1 is opposite to 6 and 4 is opposite to 2. Therefore 5 is opposite to 3.

10.

When the digit 5 is on the bottom then which number will be on its upper surface?



A.1

C.4

B.3

D.6

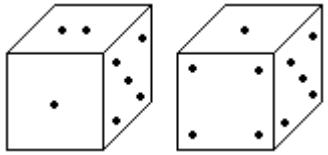
Answer: Option A

Explanation:

According to the rule no. (3), common faces with number 2 are in same positions. Hence when the digit 5 is on the bottom then 1 will on the upper surface.

11.

Observe the dots on the dice (one to six dots) in the following figures. How many dots are contained on the face opposite to the containing four dots?



A.2

C.5

B.3

D.6

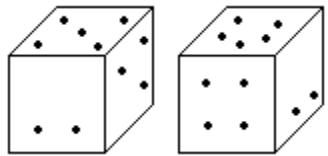
Answer: Option A

Explanation:

Here one of the two common faces (5) is in the same position, then according to the rule no (2) the remaining face with the 4 dots will be opposite to face with dots 2.

12.

Two positions of a dice are shown below. When 3 points are at the bottom, how many points will be at the top?



A.2

C.4

B.5

D.6

Answer: Option C

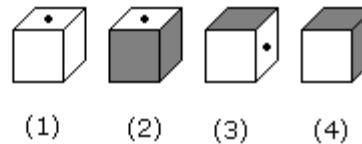
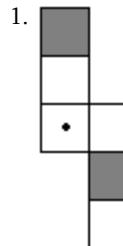
Explanation:

According to the rule (2) when 3 points are at the bottom then 4 points will be at the top.

13.

QUESTION IS NOT AVAILABLE

14. The figure given on the left hand side in each of the following questions is folded to form a box. Choose from the alternatives (1), (2), (3) and (4) the boxes that is similar to the box formed.



A.2 and 3 only

C.2 and 4 only

B.1, 3 and 4 only

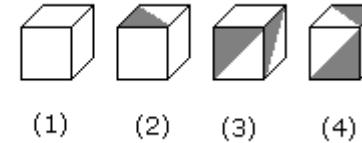
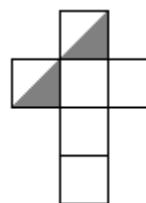
D.1 and 4 only

Answer: Option B

Explanation:

No answer description available for this question

15.



A.1 and 4 only

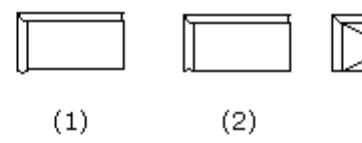
C.1 and 2 only

B.3 and 4 only

D.2 and 3 only

Ans: Option A

16.



A.1 only

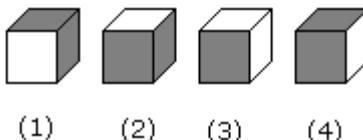
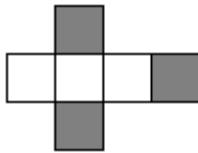
C.3 only

B.2 only

D.4 only

Ans: Option A

17.

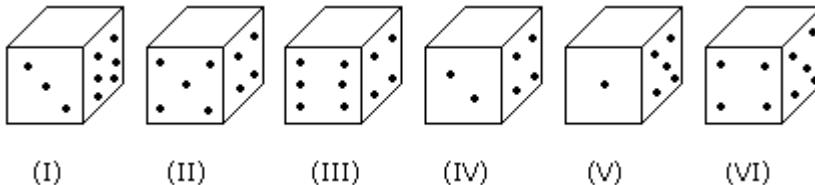


- A.1 and 3 only
C.2 and 3 only

- B.2 and 4 only
D.1, 2, 3 and 4

Ans: Option D

18. Six dice with upper faces erased are as shown.



The sum of the numbers of dots on the opposite face is 7.

1. If even numbered dice have even number of dots on their top faces, then what would be the total number of dots on the top faces of their dice?

- A.12
B.14
C.18
D.24

Answer: Option C

Explanation:

Even numbered dice are: (II), (IV) and (VI)

No. of dots on the top face of (II) dice = 6

No. of dots on the top face of (IV) dice = 6

and No. of dots on the top face of (VI) dice = 6

Therefore Required total = $6 + 6 + 6 = 18$

Even numbered dice are: (II), (IV) and (VI)
No. of dots on the top face of (II) dice = 6
No. of dots on the top face of (IV) dice = 6 and No. of dots on the top face of (VI) dice = 6
Therefore Required total = $6 + 6 + 6 = 18$

2. If the numbered dice have even number of dots on their top faces, then what would be the total number of dots on the top faces of their dice?

- A.8
B.10
C.12
D.14

Answer: Option A

Explanation:

Odd numbered dice are : (I), (III) and (V)

No. of dots on the top faces of these dice are 2, 2 and 4 respectively.

Required total = $2 + 2 + 4 = 8$

3. If dice (I), (II) and (III) have even number of dots on their bottom faces and the dice (IV), (V)

and (VI) have odd number of dots on their top faces, then what would be the difference in the total number of top faces between these two sets?

- A.0
B.2
C.4
D.6

Answer: Option D

Explanation:

No. of faces on the top faces of the dice (I), (II) and (III) are 5, 1 and 5 respectively.

Therefore, Total of these numbers = $5 + 1 + 5 = 11$

No. of dots on the top faces of the dice (IV), (V) and (VI) are 1, 3 and 1 respectively.

Therefore, Total of these numbers = $1 + 3 + 1 = 5$

Required difference = $11 - 5 = 6$

Odd numbered dice are : (II), (III) and (V)

No. of dots on the top faces of these dice are 2, 2 and 4 respectively.

Required total = $2 + 2 + 4 = 8$

4. If the even numbered dice have odd number of dots on their top faces and odd numbered dice have even of dots on their bottom faces, then what would be the total number of dots on their top faces?

- A.12
B.14
C.16
D.18

Answer: Option C

Explanation:

No. of dots on the top faces of the dice (II), (IV) and (VI) are 1, 1 and 1 respectively.

No. of dots on the top faces of the dice (I), (III) and (V) are 5, 5 and 3 respectively.

Required total = $5 + 5 + 3 + 1 + 1 + 1 = 16$

5. If the dice (I), (II) and (III) have even number of dots on their bottom faces, then what would be the total number of dots on their top faces?

- A.7
B.11
C.12
D.14

Answer: Option B

Explanation:

No. of dots on the top faces of dice (I), (II) and (III) are 5, 1 and 5 respectively.

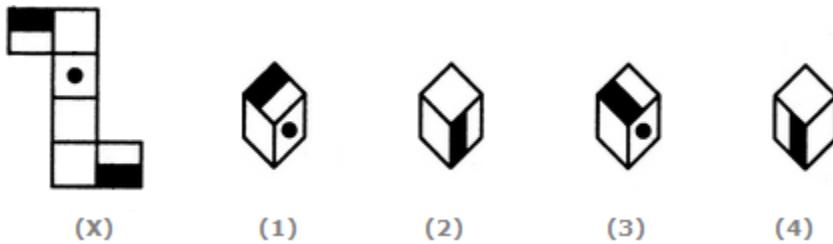
Required total = $5 + 1 + 5 = 11$

CUBES AND DICE ANSWERS

The sheet of paper shown in the figure (X) given on the left hand side, in each problem, is folded to form a box. Choose from amongst the alternatives (1), (2), (3) and (4), the boxes that are similar to the box that will be formed.

1.

Choose the box that is similar to the box formed from the given sheet of paper (X).



- A.1 and 2 only
B.2 and 3 only
C.2 and 4 only
D.1, 2, 3 and 4

Answer: Option D

Explanation:

The fig. (X) is similar to **Form II**. So, when a cube is formed by folding the sheet shown in fig. (X), then the two half-shaded faces lie opposite to each other and one of the three blank faces appears opposite to the face bearing a dot. Clearly, each one of the four cubes shown in figures (1), (2), (3) and (4) can be formed by folding the sheet shown in fig. (X).

2.

Choose the box that is similar to the box formed from the given sheet of paper (X).



- A.1 only
B.1 and 3 only
C.1, 3 and 4 only
D.1, 2, 3 and 4

Answer: Option C

Explanation:

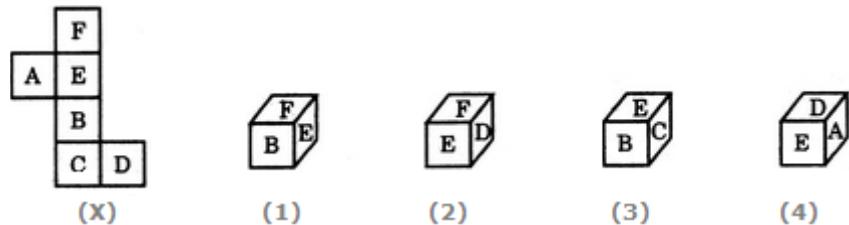
When the sheet in fig. (X) is folded, then one of the faces of the cube formed will be of the form



and this face will lie opposite the face bearing a square. Also, one of the blank faces lies opposite another blank face and the third blank face lies opposite the face bearing an '=' sign. Clearly, all the three blank faces cannot appear adjacent to each other. So, the cube shown in fig. (2) which has all the three blank faces adjacent to each other cannot be formed. Hence, only the cubes shown in figures A, C and D can be formed.

3.

Choose the box that is similar to the box formed from the given sheet of paper (X).



- A.1 only
B.2 only
C.1 and 3 only
D.1, 2, 3 and 4 only

4.

Choose the box that is similar to the box formed from the given sheet of paper (X).



- A.1 only
B.2 only
C.3 only
D.4 only

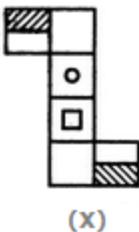
Answer: Option B

Explanation:

The fig. (X) is similar to the **Form III**. So, when the sheet in fig. (X) is folded to form a cube, then the half-shaded face appears opposite to the face bearing a rhombus, the face with a black circle appears opposite to one of the two blank faces and the face with a '+' sign appears opposite to the other blank face. Clearly, the cubes shown in figures (1) and (4) cannot be formed since they have the half-shaded face adjacent to the face bearing the rhombus. Also, though the cube shown in fig. (3) has faces that can appear adjacent to each other but the cube formed by folding the sheet in fig. (X) cannot be rotated to form fig. (3). Hence, the cube in fig. (3) cannot be formed. Thus, only the cube shown in fig. (2) can be formed.

5.

Choose the box that is similar to the box formed from the given sheet of paper (X).



- A.1 only
B.2 only
C.3 only
D.4 only

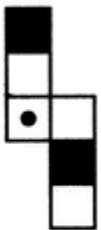
Answer: Option A

Explanation:

The fig. (X) is similar to the **Form II**. So, when the sheet shown in fig. (X) is folded to form a cube then the two half-shaded faces lie opposite to each other, the face bearing a square lies opposite to one of the two blank faces and the face bearing a circle lies opposite to the other blank face. Therefore, the cubes shown in figures (2) and (3) which have the two half-shaded faces adjacent to each other, cannot be formed by folding the sheet shown in fig. (X). Also, though the cube shown in fig. (4) has faces that can appear adjacent to each other but the cube formed by folding the sheet in fig. (X) cannot be rotated to form the cube in fig. (4). Hence, only the cube in fig. (1) can be formed.

6.

Choose the box that is similar to the box formed from the given sheet of paper (X).



- A.2 and 3 only
B.1, 3 and 4 only
C.2 and 4 only
D.1 and 4 only

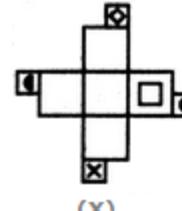
Answer: Option B

Explanation:

The fig. (X) is similar to the **Form V**. So, when the sheet in fig. (X) is folded to form a cube, then the face bearing a dot lies opposite to one of the shaded faces. Therefore, the cube shown in fig. (2) which has both the shaded faces adjacent to the face bearing the dot, cannot be formed. Hence, the cubes shown in figures (1), (2) and (4) can be formed.

7.

Choose the box that is similar to the box formed from the given sheet of paper (X).



- A.1, 2 and 3 only
B.2 and 3 only
C.1, 3 and 4 only
D.2, 3 and 4 only

Answer: Option D

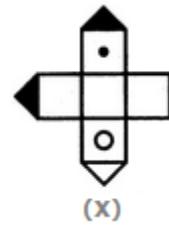
Explanation:

The fig. (X) is similar to the **Form VII**. So, when a cube is formed by folding the sheet shown in

fig. (X), then is one of the faces of the cube and this face lies opposite to a blank face. Also, a face bearing a square lies opposite to another blank face. The remaining two blank faces lie opposite to each other. Clearly, in the cube shown in fig. (1), the face consisting of the four symbols is not the same as that formed (as shown above). Hence, the cube in fig. (1) cannot be formed.

8.

Choose the box that is similar to the box formed from the given sheet of paper (X).



- A.1 and 2 only
B.1, 2 and 3 only
C.1 and 3 only
D.1, 2, 3 and 4

Answer: Option A

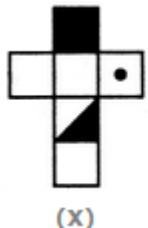
Explanation:

The fig. (X) is similar to the **Form VI**. So, when a cube is formed by folding the sheet shown in

fig. (X), then is one of the faces of the cube and this face lies opposite to a blank face. Also, a face bearing a circle lies opposite to one bearing a dot. Clearly, this cube does not have faces as shown in the cubes in figures (3) and (4). Hence, only the cubes shown in figures (1) and (2) can be formed.

9.

Choose the box that is similar to the box formed from the given sheet of paper (X).



(X)



(1)



(2)



(3)



(4)

- A.1 and 3 only
- B.2, 3 and 4 only
- C.2 only
- D.3 and 4 only

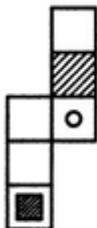
Answer: Option C

Explanation:

The fig. (X) is similar to the **Form I**. So, when the sheet in fig. (X) is folded to form a cube, then the completely shaded face lies opposite to the half shaded face. Therefore, the cubes shown in figures (1) and (3) which have the completely shaded face adjacent to the half-shaded face cannot be formed. Since Fig 4 doesn't have at-least one shaded face, it cannot be formed. Hence, only the cubes in figure (2) can be formed.

10.

Choose the box that is similar to the box formed from the given sheet of paper (X).



(X)



(1)



(2)



(3)



(4)

- A.1 and 2 only
- B.1, 2 and 4 only
- C.1 and 4 only
- D.1, 2 and 3 only

Answer: Option B

Explanation:

The fig. (X) is similar to the **Form V**. So, when the sheet shown in fig. (X) is folded to form a cube then the shaded face lies opposite to one of the blank faces, the face bearing a circle lies opposite to another blank face and the face bearing a shaded square lies opposite to the third blank face. Thus, each one of the cubes shown in figures (1), (2) and (4) can be formed. Also, though the cube shown in fig. (3) has faces that can appear adjacent to each other but the cube formed by folding the sheet in fig. (X) cannot be rotated to form fig. (3). Hence, the cube in fig.(3) cannot be formed.

11.

Four usual dice are thrown on the ground. The total of numbers on the top faces of these four dice is 13 as the top faces showed 4, 3, 1 and 5 respectively. What is the total of the faces touching the ground?

- A.12
- B.13
- C.15
- D.Cannot be determined

Answer: Option C

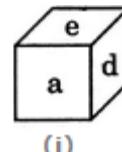
Explanation:

In a usual dice, the sum of the numbers on any two opposite faces is always 7. Thus, 1 is opposite 6, 2 is opposite 5 and 3 is opposite 4.

Consequently, when 4, 3, 1 and 5 are the numbers on the top faces, then 3, 4, 6 and 2 respectively are the numbers on the face touching the ground. The total of these numbers = $3 + 4 + 6 + 2 = 15$.

12.

In a dice a, b, c and d are written on the adjacent faces, in a clockwise order and e and f at the top and bottom. When c is at the top, what will be at the bottom?



(i)

- A.a
- B.b
- C.c
- D.d

Answer: Option A

Explanation:

Clearly, the six faces are labelled as

Face I \rightarrow a, Face IV \rightarrow b, Face III \rightarrow c, Face II \rightarrow d, Face V \rightarrow e, Face VI \rightarrow f

Therefore 'a' appears opposite 'c'.

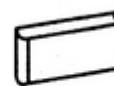
Hence, when 'c' is at the top, then 'a' will be at the bottom.

13.

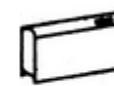
Which of the following finished patterns can be obtained from the piece of cardboard (X) shown below?



(X)



(1)



(2)



(3)



(4)

A.1

B.2

C.3

D.4

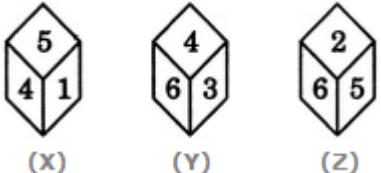
Answer: Option A

Explanation:

The pattern on fig. (X) and also the fact that the faces are rectangle, indicate that only fig. (I) can be obtained by folding fig. (X).

14.

Three different positions X, Y and Z of a dice are shown in the figures given below. Which number lies at the bottom face in position X?



A.2

B.3

C.6

D.Cannot be determined

Answer: Option B

Explanation:

From positions X and Y we conclude that 1, 5, 6 and 3 lie adjacent to 4. Therefore, 2 must lie opposite 4. From positions Y and Z we conclude that 4, 3, 2 and 5 lie adjacent to 6. Therefore, 1 must lie opposite 6. Thus, 2 lies opposite 4, 1 lies opposite 6 and consequently 5 lies opposite 3. As analysed above, the number on the face opposite 5 is 3. In position X, since 5 lies on the top, therefore 3 must lie at the bottom face.

15.

A dice is numbered from 1 to 6 in different ways.

If 1 is opposite to 5 and 2 is opposite to 3, then

A.4 is adjacent to 3 and 6

B.2 is adjacent to 4 and 6

C.4 is adjacent to 5 and 6

D.6 is adjacent to 3 and 4

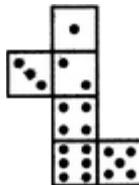
Answer: Option B

Explanation:

If 1 is opposite to 5 and 2 is opposite to 3, then 4 definitely lies opposite to 6. Therefore, 2 cannot lie opposite to any of the two numbers - 4 or 6. Hence, 2 necessarily lies adjacent to both 4 and 6.

16.

When the following figure is folded to form a cube, how many dots lie opposite the face bearing five dots?



A.1

B.2

C.3

D.4

Answer: Option C

Explanation:

The given figure is similar to **Form III**. Therefore, when this figure is folded to form a cube then the face bearing three dots will lie opposite the face bearing five dots.

17.

Choose the box that is similar to the box formed from the given sheet of paper (X).



A.1 only

B.1, 2 and 3 only

C.2 and 3 only

1, 2, 3 and 4

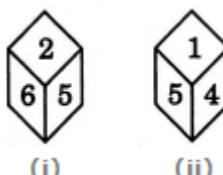
Answer: Option D

Explanation:

The fig. (X) is similar to the **Form V**. So, when the sheet in fig. (X) is folded to form a cube, then the face bearing a dot appears opposite to a blank face, the face bearing a '+' sign appears opposite to another blank face and the face bearing a circle appears opposite to the third blank face. Clearly, all the four cubes shown in figures (1), (2), (3) and (4) can be formed.

18.

What number is opposite 3 in the figure shown below? The given two positions are of the same dice whose each surface bears a number among 1, 2, 3, 4, 5 and 6.



A.2

B.4

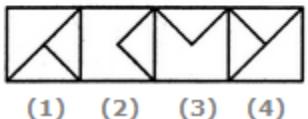
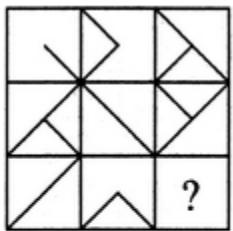
C.5

D.6

Answer: Option C

Explanation:

From figures (i) and (ii), we conclude that 2, 6, 1 and 4 appear adjacent to 5. Therefore, 3 must



A.1

C.3

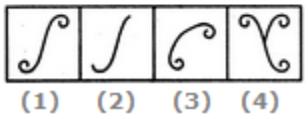
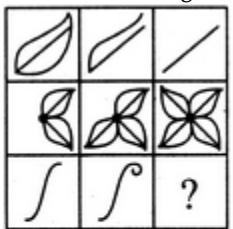
Answer: Option B

Explanation:

The third figure in each row comprises of parts which are not common to the first two figures.

2.

Select a suitable figure from the four alternatives that would complete the figure matrix.



A.1

C.3

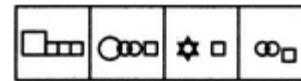
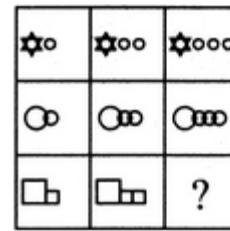
Answer: Option A

Explanation:

The number of components in each row either increases or decreases from left to right. In the third row, it increases.

3.

Select a suitable figure from the four alternatives that would complete the figure matrix.



(1) (2) (3) (4)

A.1

C.3

B.2

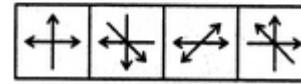
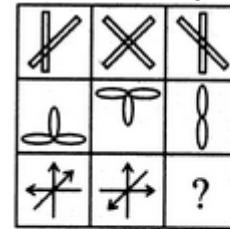
D.4

Ans: Option A

In each row, the second figure is obtained from the first figure by increasing the number of smaller elements by one and the third figure is obtained from the second figure by increasing the number of smaller elements by one.

4.

Select a suitable figure from the four alternatives that would complete the figure matrix.



(1) (2) (3) (4)

A.1

C.3

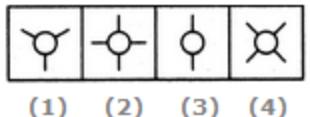
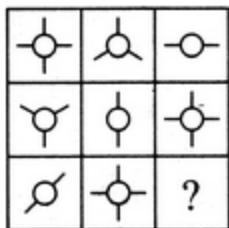
B.2

D.4

Ans: Option C

The third figure in each row comprises of parts which are not common to the first two figures.

5. Select a suitable figure from the four alternatives that would complete the figure matrix.



A.1

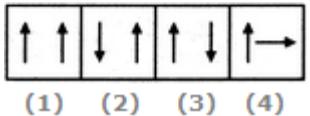
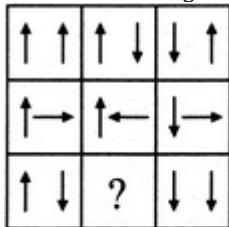
C.3

Ans: Option A

EXPLANATION: Each row (as well as each column) contains a figure consisting of a circle and two line segments, a figure consisting of a circle and three line segments and a figure consisting of a circle and four line segments.

6.

Select a suitable figure from the four alternatives that would complete the figure matrix.



A.1

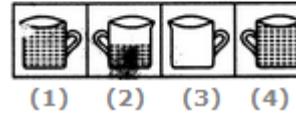
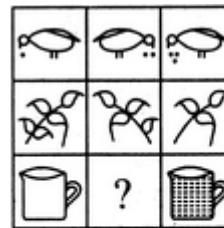
C.3

ANS: Option A

In each row, the second figure is obtained from the first figure by reversing the direction of the RHS arrow and the third figure is obtained from the second figure by reversing the direction of both the arrows.

7.

Select a suitable figure from the four alternatives that would complete the figure matrix.



A.1

C.3

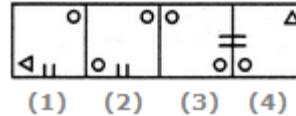
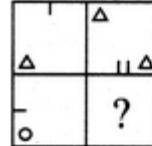
Answer: Option B

Explanation:

In each row, the figures are getting laterally inverted in each step. The number of components or the quantities are either increasing or decreasing from left to right sequentially.

8.

Select a suitable figure from the four alternatives that would complete the figure matrix.



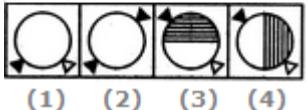
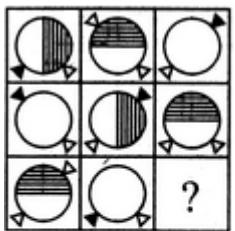
A.1

C.3

ANS: Option C

The second figure is obtained from the first figure by moving the line segment to the opposite side of the square boundary and replacing it with two similar line segments. Also, the element in the lower-left corner gets replaced by two similar elements - one placed in the upper-left and the other placed in the lower-right corner.

9. Select a suitable figure from the four alternatives that would complete the figure matrix.



A.1

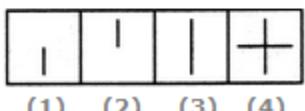
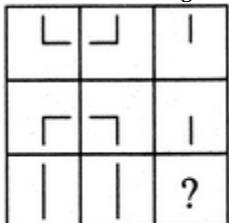
C.3

ANS: Option D

In each row, there are 3 types of shadings of circles - a circle is unshaded, another circle has its right half shaded with vertical lines and yet another circle has its upper half shaded with horizontal lines. There are three specified positions of the two triangles each of which is used only once in a row. Also, two of the figures in each row have one triangle shaded.

10.

Select a suitable figure from the four alternatives that would complete the figure matrix.



A.1

C.3

ANS: Option C

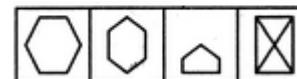
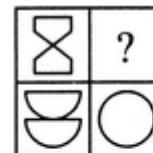
In each row, the third figure is a collection of the common elements (line segments) of the first and the second figures.

11.

Select a suitable figure from the four alternatives that would complete the figure matrix.

B.2

D.4



(1)

(2)

(3)

(4)

A.1

C.3

B.2

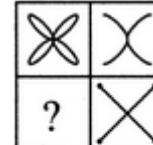
D.4

ANS: Option B

The two parts of the first figure are rearranged and joined along the longer sides. The common side is then lost to form the second figure.

12.

Select a suitable figure from the four alternatives that would complete the figure matrix.



(1)

(2)

(3)

(4)

A.1

C.3

B.2

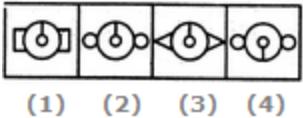
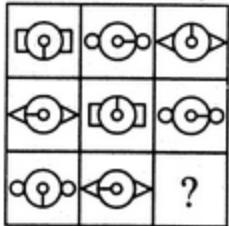
D.4

ANS: Option C

The second figure is a part of the first figure (but is not exactly the same as the first figure).

13. QUESTION UN AVAILABLE

14. Select a suitable figure from the four alternatives that would complete the figure matrix.



A.1

C.3

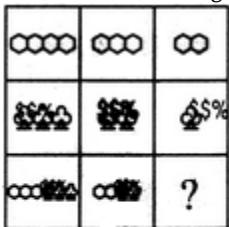
ANS: Option A

B.2

D.4

In each row, the central part of the first figure rotates either 90° CW or 90° ACW to form the central part of the second figure and the central part of the first figure rotates through 180° to form the central part of the third figure. Also, in each row, there are 3 types of side elements - rectangles, circles and triangles.

15. Select a suitable figure from the four alternatives that would complete the figure matrix.



A.1

C.3

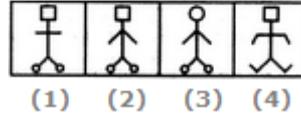
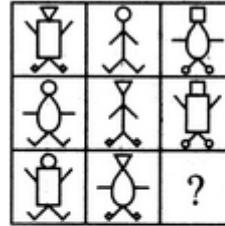
ANS: Option B

B.2

D.4

In each column, the third figure (lowermost figure) contains one less number of hexagons as the first figure (uppermost figure) and the same number of trees as the second figure (middle figure).

Select a suitable figure from the four alternatives that would complete the figure matrix.



A.1

C.3

ANS: Option B

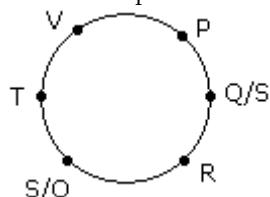
There are 3 types of faces, 3 types of bodies, 3 types of hands and 3 types of legs, each of which is used only once in a single row. So, the features which have not been used in the first two figures of the third row would combine to produce the missing figure.

SEATING ARRANGEMENT

1.A. Six girls are sitting in a circle facing to the centre of the circle. They are P, Q, R, S, T and V. T is not between Q and S but some other one. P is next to the left of V. R is 4th to the right of P. Which of the following statement is not true ?

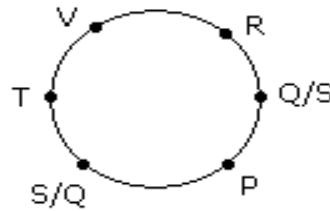
- A.S is just next to the right to R
- B.T is just next to the right of V
- C.R is second to the left of T
- D.P is second to the right of R

ANS: Option C



1.B.If P and R interchange their positions then which of the following pair will sit together ?

- A.RT
- B. PV
- C.VR
- D.QV



ANS: Option C

After changing the position of P and R

2. In a class there are seven students (including boys and girls) A, B, C, D, E, F and G. They sit on three benches I, II and III. Such that at least two students on each bench and at least one girl on each bench. C who is a girl student, does not sit with A, E and D. F the boy student sits with only B. A sits on the bench I with his best friends. G sits on the bench III. E is the brother of C.

1. How many girls are there out of these 7 students ?

- A.3
- B.3 or 4
- C.4
- D.Data inadequate

ANS: Option B



Boy

Girl

The number of girls is either 3 or 4.

2.B.

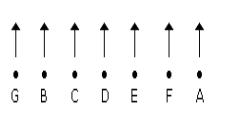
Which of the following is the group of girls ?

- A.BAC
- B.BFC
- C.BCD
- D.CDF

ANS: Option C



Boy



Girl



BCD are the group of girls.

3. A, B, C, D, E, F and G are sitting in a row facing North :

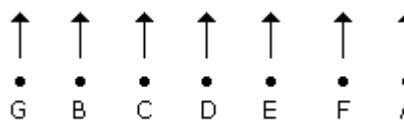
1. F is to the immediate right of E.
2. E is 4th to the right of G.
3. C is the neighbour of B and D.
4. Person who is third to the left of D is at one of ends.

1. Who are to the left of C ?

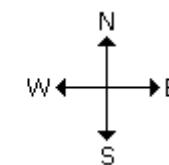
- A.Only B
- C.G and B

Answer: Option C

Explanation:



- B.G, B and D
- D.D, E, F and A



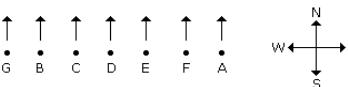
G and B are to the left of C.

3.b.

Who are the neighbours of B ?

- A.C and D
- C.G and F

ANS: Option B



C and G are the neighbours of B.

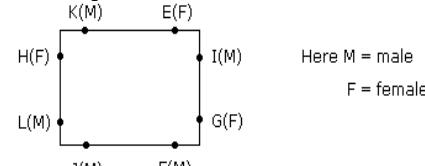
4. Each of these questions are based on the information given below :

1. 8 persons E, F, G, H, I, J, K and L are seated around a square table - two on each side.
2. There are 3 ladies who are not seated next to each other.
3. J is between L and F.
4. G is between I and F.
5. H, a lady member is second to the left of J.
6. F, a male member is seated opposite to E, a lady member.
7. There is a lady member between F and I.

1. Who among the following is to the immediate left of F ?

- A.G
- B.I
- C.J
- D.H

ANS: Option C



Here M = male
F = female

J is to the immediate left of F.

4.b.

How many persons are seated between K and F ?

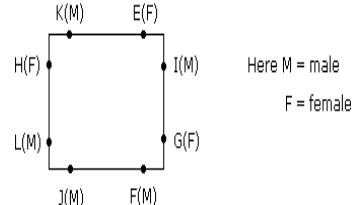
A.1

B.2

C.3

D.4

Option C



Three persons are seated between K and F(H, L and J) or E, I and G.

5. A, B, C, D, E, F and G are sitting in a row facing North :

1. F is to the immediate right of E.
2. E is 4th to the right of G.
3. C is the neighbour of B and D.
4. Person who is third to the left of D is at one of ends.

1. Who are to the left of C ?

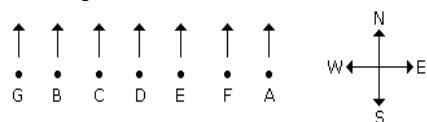
A.Only B

C.G and B

B.G, B and D

D.D, E, F and A

ANS: Option C



6.Which of the following statement is not true ?

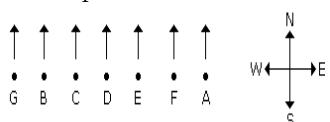
A.E is to the immediate left of D

B.A is at one of the ends

C.G is to the immediate left of B

D.F is second to the right of D

ANS: Option A



7. Each of these questions are based on the information given below:

1. A ,B, C, D and E are five men sitting in a line facing to south - while M, N, O, P and Q are five ladies sitting in a second line parallel to the first line and are facing to North.
2. B who is just next to the left of D, is opposite to Q.
3. C and N are diagonally opposite to each other.

4. E is opposite to O who is just next right of M.

5. P who is just to the left of Q, is opposite to D.

6. M is at one end of the line.

7.aWho is sitting third to the right of O ?

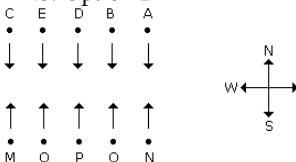
A.Q

B.N

C.M

D.Data inadequate

ANS: Option B



7.b.

Which of the following pair is diagonally opposite to each other ?

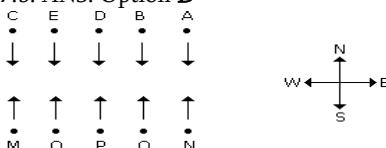
A.EQ

B.BO

C.AN

D.AM

7.b. ANS: Option D



8. Six friends P, Q, R, S, T and U are sitting around the hexagonal table each at one corner and are facing the centre of the hexagonal. P is second to the left of U. Q is neighbour of R and S. T is second to the left of S.

Which one is sitting opposite to P ?

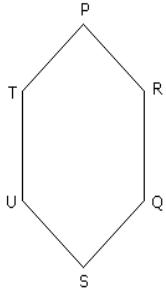
A.R

B.Q

C.T

D.S

8.a. ANS: Option D

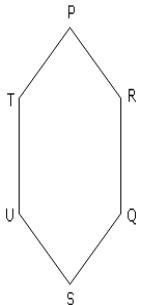


8.b.

Who is the fourth person to the left of Q?

- A.P
- B.U
- C.R
- D.Data inadequate

ANS: Option A



DIRECTION SENSE TEST

1.

One morning Udai and Vishal were talking to each other face to face at a crossing. If Vishal's shadow was exactly to the left of Udai, which direction was Udai facing?

- A.East
- B.West
- C.North
- D.South

Answer: Option C

Explanation:



2.

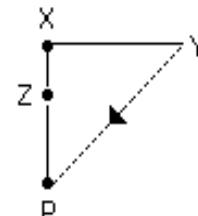
Y is in the East of X which is in the North of Z. If P is in the South of Z, then in which direction

of Y, is P?

- A.North
- B.South
- C.South-East
- D.None of these

Answer: Option D

Exp:



P is in South-West of Y.

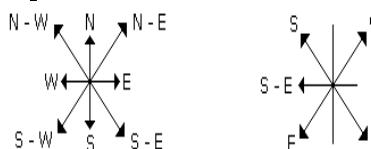
3.

If South-East becomes North, North-East becomes West and so on. What will West become?

- A.North-East
- B.North-West
- C.South-East
- D.South-West

Answer: Option C

Exp:



It is clear from the diagrams that new name of West will become South-East.

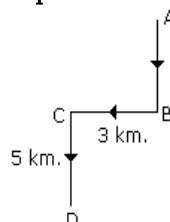
4.

A man walks 5 km toward south and then turns to the right. After walking 3 km he turns to the left and walks 5 km. Now in which direction is he from the starting place?

- A.West
- B.South
- C.North-East
- D.South-West

Ans: Option D

Exp:



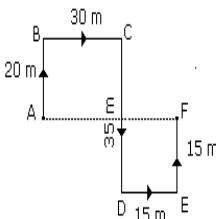
5.

Rasik walked 20 m towards north. Then he turned right and walks 30 m. Then he turns right and walks 35 m. Then he turns left and walks 15 m. Finally he turns left and walks 15 m. In which direction and how many metres is he from the starting position?

- A.15 m West
- B.30 m East
- C.30 m West
- D.45 m East

Ans: Option D

Ans:



Required distance = AF

$$= 30 + 15$$

$$= 45 \text{ m.}$$

From the above diagram, F is in East direction from A.

Hence the required answer is '45 m East'.

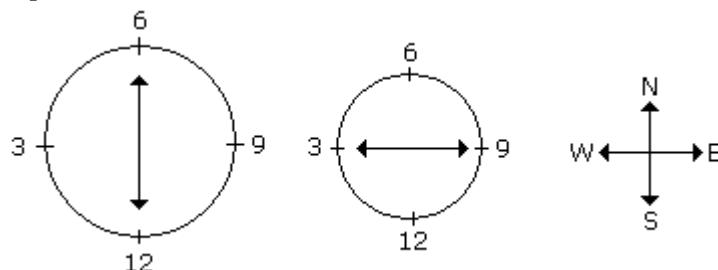
6.

Rahul put his timepiece on the table in such a way that at 6 P.M. hour hand points to North. In which direction the minute hand will point at 9.15 P.M. ?

- A.South-East
- B.South
- C.North
- D.West

Answer: Option D

Explanation:



At 9.15 P.M., the minute hand will point towards west.

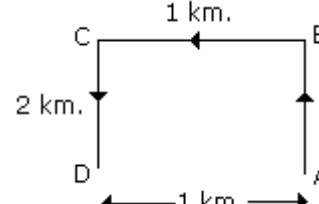
7.

A boy rode his bicycle Northward, then turned left and rode 1 km and again turned left and rode 2 km. He found himself 1 km west of his starting point. How far did he ride northward initially?

- A.1 km
- B.2 km
- C.3 km
- D.5 km

Answer: Option B

Explanation:



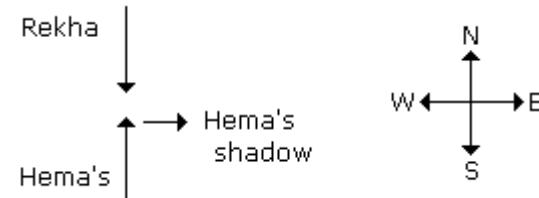
The boy rode 2 km. Northward.

8. One evening before sunset Rekha and Hema were talking to each other face to face. If Hema's shadow was exactly to the right of Hema, which direction was Rekha facing?

- A.North
- B.South
- C.East
- D.Data is inadequate

Answer: Option B

Explanation:



In the evening sun sets in West. Hence then any shadow falls in the East. Since Hema's shadow was to the right of Hema. Hence Rekha was facing towards South.

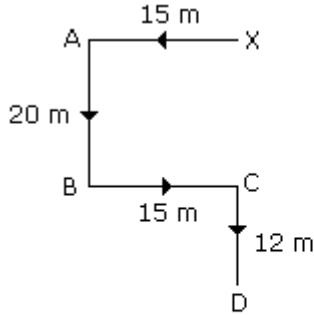
9.

Starting from the point X, Jayant walked 15 m towards west. He turned left and walked 20 m. He then turned left and walked 15 m. After this he turned to his right and walked 12 m. How far and in which directions is now Jayant from X?

- A.32 m, South
- B.47 m, East
- C.42 m, North
- D.27 m, South

Answer: Option A

Explanation:



$$\begin{aligned}\text{Required distance} &= 20 + 12 \\ &= 32 \text{ m in south direction}\end{aligned}$$

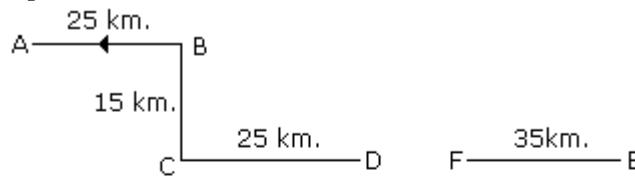
10.

Two cars start from the opposite places of a main road, 150 km apart. First car runs for 25 km and takes a right turn and then runs 15 km. It then turns left and then runs for another 25 km and then takes the direction back to reach the main road. In the mean time, due to minor break down the other car has run only 35 km along the main road. What would be the distance between two cars at this point?

- | | |
|---------|---------|
| A.65 km | B.75 km |
| C.80 km | D.85 km |

Answer: Option A

Explanation:



$$\text{Required distance} = DF$$

$$\begin{aligned}&= 150 - (25 + 25 + 35) \\ &= 150 - 85 \\ &= 65 \text{ km.}\end{aligned}$$

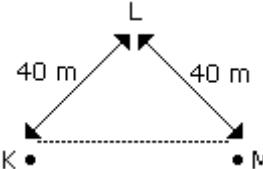
11.

K is 40 m South-West of L. If M is 40 m South-East of L, then M is in which direction of K?

- | | |
|--------------|---------|
| A.East | B. West |
| C.North-East | D.South |

Answer: Option A

Explanation:



Hence M is in the East of K.

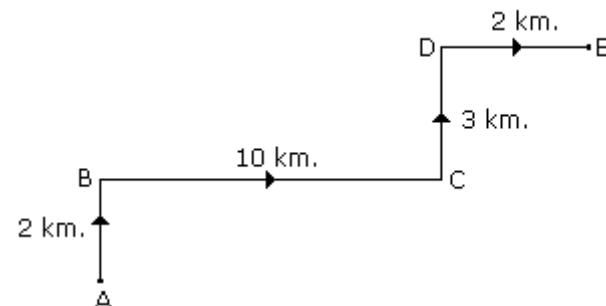
12.

A man walks 2 km towards North. Then he turns to East and walks 10 km. After this he turns to North and walks 3 km. Again he turns towards East and walks 2 km. How far is he from the starting point?

- | | |
|---------|-----------------|
| A.10 km | B.13 km |
| C.15 km | D.None of these |

Answer: Option B

Explanation:



$$\text{Required distance} = AE$$

$$\begin{aligned}&= \sqrt{5^2 + 12^2} \\ &= 13 \text{ km.}\end{aligned}$$

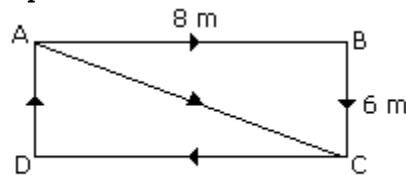
13.

The length and breadth of a room are 8 m and 6 m respectively. A cat runs along all the four walls and finally along a diagonal order to catch a rat. How much total distance is covered by the cat?

- | | |
|------|------|
| A.10 | B.14 |
| C.38 | D.48 |

Answer: Option C

Explanation:



$$\begin{aligned}
 \text{Required distance} &= 8 + 6 + 8 + 6 + \sqrt{8^2 + 6^2} \\
 &= 28 + \sqrt{100} \\
 &= 28 + 10 \\
 &= 38 \text{ m}
 \end{aligned}$$

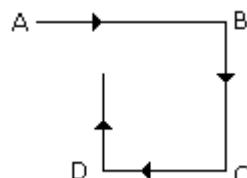
14.

One morning Sujata started to walk towards the Sun. After covering some distance she turned to right then again to the right and after covering some distance she again turns to the right. Now in which direction is she facing?

- A. North
B. South
C. North-East
D. South-West

Answer: Option A

Explanation:



Hence finally Sujata will face towards North.

15.

One morning after sunrise, Vimal started to walk. During this walking he met Stephen who was coming from opposite direction. Vimal watch that the shadow of Stephen to the right of him (Vimal). To Which direction Vimal was facing?

- A. East
B. West
C. South
D. Data inadequate

Answer: Option C

Explanation:

Sun rises in the east. So the shadow of a man will always fall towards the west. Since the shadow of Stephen is to the right of Vimal. Hence Vimal is facing towards South.

16.

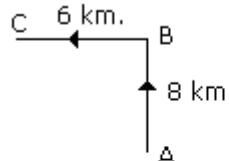
Golu started from his house towards North. After covering a distance of 8 km. he turned towards

left and covered a distance of 6 km. What is the shortest distance now from his house?

- A. 10 km.
B. 16 km.
C. 14 km
D. 2 km.

Answer: Option A

Explanation:



Required distance = AC

$$\begin{aligned}
 &= \sqrt{8^2 + 6^2} \\
 &= \sqrt{64 + 36} \\
 &= \sqrt{100} \\
 &= 10 \text{ km.}
 \end{aligned}$$

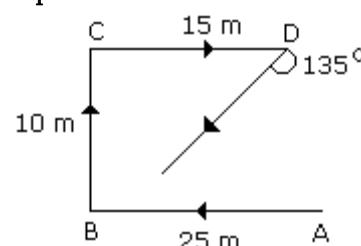
17.

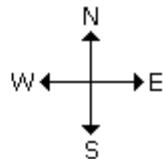
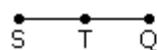
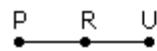
P started from his house towards west. After walking a distance of 25 m. He turned to the right and walked 10 m. He then again turned to the right and walked 15 m. After this he is to turn right at 135° and to cover 30 m. In which direction should he go?

- A. West
B. South
C. South-West
D. South-East

Answer: Option C

Explanation:





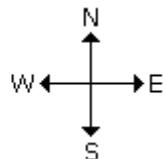
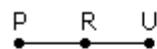
Hence URP flat combination get south facing flats.

3. The flats of which of the other pair than SU, is diagonally opposite to each other?

- A.QP
- B.QR
- C.PT
- D.TS

Answer: Option A

Explanation:



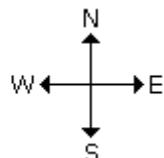
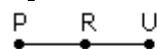
Hence QP is diagonally opposite to each other.

4. Whose flat is between Q and S?

- A.T
- B.U
- C.R
- D.P

Answer: Option A

Explanation:



Hence flat T is between Q and S.

21. Each of the following questions is based on the following information:

1. 8-trees → mango, guava, papaya, pomegranate, lemon, banana, raspberry and apple are in two rows 4 in each facing North and South.
2. Lemon is between mango and apple but just opposite to guava.
3. Banana is at one end of a line and is just next in the right of guava or either banana tree is just after guava tree.
4. Raspberry tree which at one end of a line, is just diagonally opposite to mango tree.

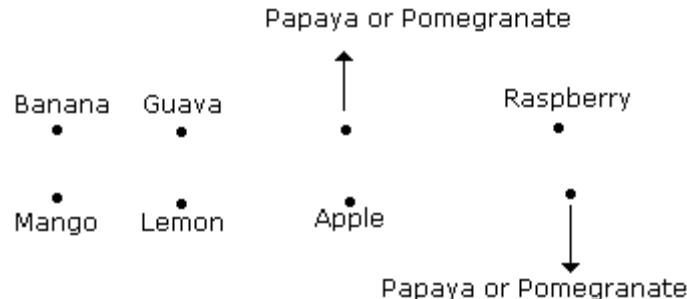
1.

Which tree is just opposite to raspberry tree?

- A.Papaya
- B. Pomegranate
- C.Papaya or Pomegranate
- D.Data is inadequate

Answer: Option C

Explanation:



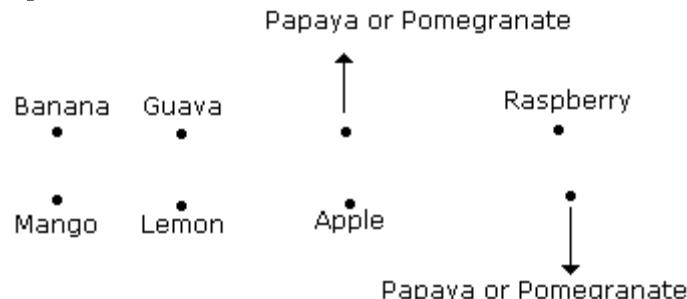
2.

Which tree is just opposite to banana tree?

- A.Mango
- B.Pomegranate
- C.Papaya
- D.Data is inadequate

Answer: Option A

Explanation:



22. Each of the following questions is based on the following information:

1. A # B means B is at 1 metre to the right of A.
2. A \$ B means B is at 1 metre to the North of A.
3. A * B means B is at 1 metre to the left of A.
4. A @ B means B is at 1 metre to the south of A.
5. In each question first person from the left is facing North.

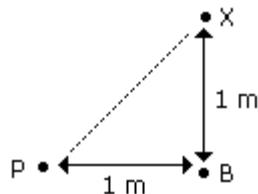
1. According to X @ B * Y, Y is in which direction with respect to X?

- A.North
- B.South
- C.North-East
- D.South-West

Answer: Option D

Explanation:

According to X @ B * Y



Hence Y is in South-West of X.

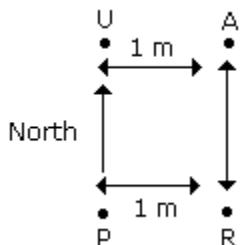
2. According to $P \# R \$ A * U$, in which direction is U with respect to P?

- A. East
- B. West
- C. North
- D. South

Answer: Option C

Explanation:

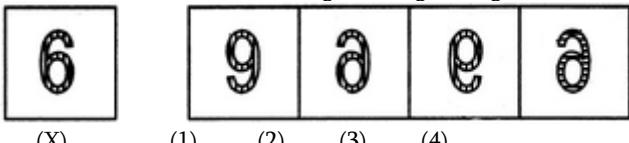
According to $P \# R \$ A * U$



Hence U is in North direction with respect to P.

MIRROR AND WATER IMAGES

1. Choose the correct mirror image of the given figure (X) from amongst the four alternatives.

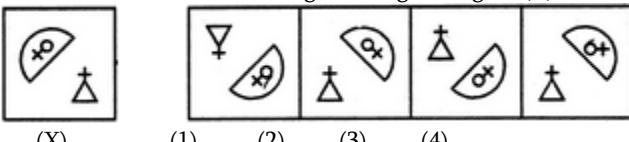


- A.1
- B.2
- C.3
- D.4

ANS: Option B

2.

Choose the correct mirror image of the given figure (X) from amongst the four alternatives.

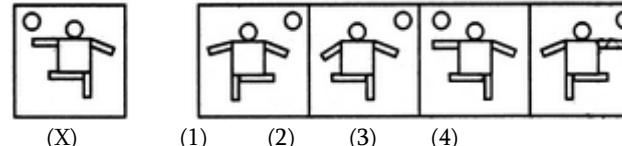


- A.1
- B.2
- C.3
- D.4

Answer: Option B

3.

Choose the correct mirror image of the given figure (X) from amongst the four alternatives.

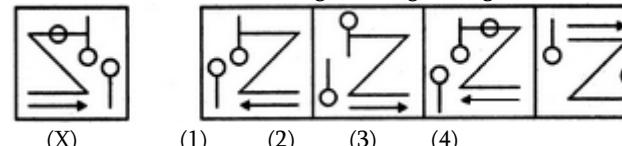


- A.1
- B.2
- C.3
- D.4

Answer: Option D

4.

Choose the correct mirror image of the given figure (X) from amongst the four alternatives.

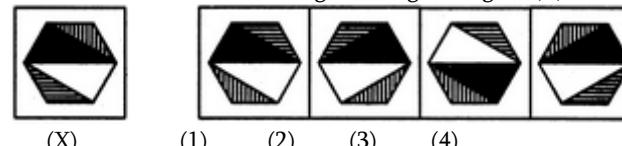


- A.1
- B.2
- C.3
- D.4

ANS: Option C

5.

Choose the correct mirror image of the given figure (X) from amongst the four alternatives.

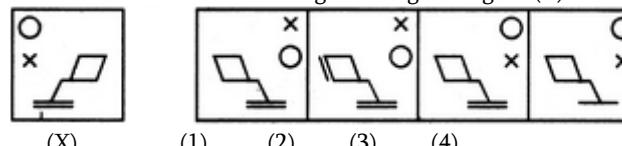


- A.1
- B.2
- C.3
- D.4

ANS: Option D

6.

Choose the correct mirror image of the given figure (X) from amongst the four alternatives.

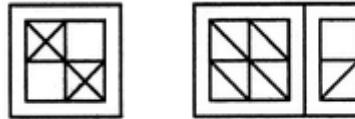


- A.1
- B.2
- C.3
- D.4

ANS: Option C

7.

Choose the correct mirror image of the given figure (X) from amongst the four alternatives.



(X) (1) (2) (3) (4)

A.1

C.3

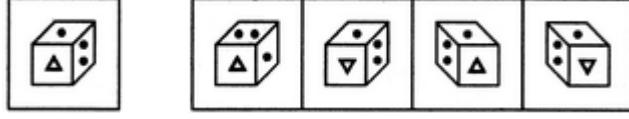
ANS: Option D

B.2

D.4

8.

Choose the correct mirror image of the given figure (X) from amongst the four alternatives.



(X) (1) (2) (3) (4)

A.1

C.3

ANS: Option C

B.2

D.4

9.

Choose the correct mirror image of the given figure (X) from amongst the four alternatives.



(X) (1) (2) (3) (4)

A.1

C.3

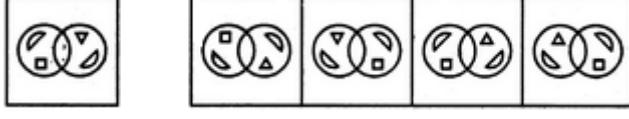
ANS: Option A

B.2

D.4

10.

Choose the correct mirror image of the given figure (X) from amongst the four alternatives.



(X) (1) (2) (3) (4)

A.1

C.3

ANS: Option B

B.2

D.4

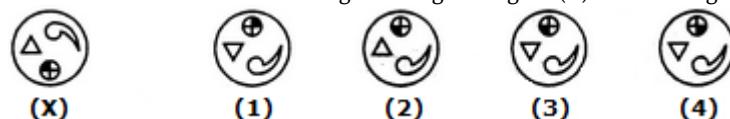
11. Choose the correct water image of the given figure (X) from amongst the four alternatives.

 (X)	 (1)	 (2)	 (3)	 (4)
---------	---------	---------	---------	---------

A.1 B.2
C.3 D.4

ANS: Option D

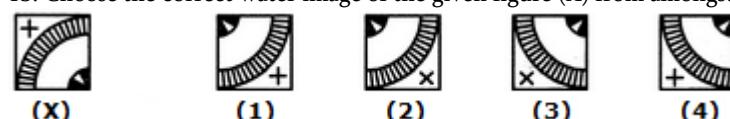
12. Choose the correct water image of the given figure (X) from amongst the four alternatives.



A.1 B.2
C.3 D.4

ANS: Option C

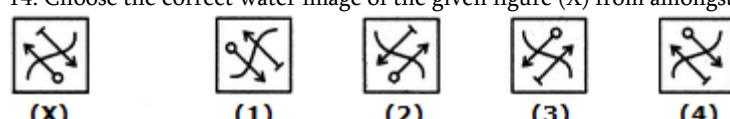
13. Choose the correct water image of the given figure (X) from amongst the four alternatives.



A.1 B.2
C.3 D.4

ANS: Option D

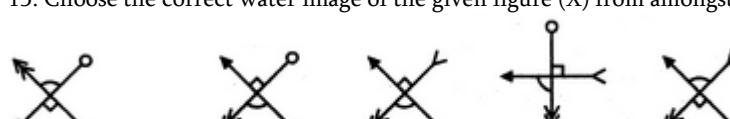
14. Choose the correct water image of the given figure (X) from amongst the four alternatives.



A.1 B.2
C.3 D.4

ANS: Option C

15. Choose the correct water image of the given figure (X) from amongst the four alternatives.



A.1 B.2
C.3 D.4

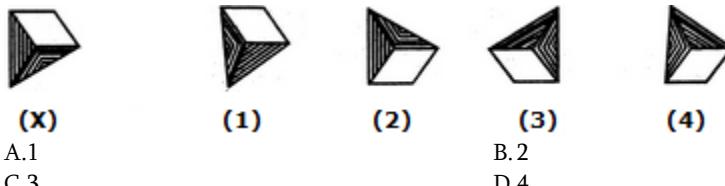
ANS: Option B

16. Choose the correct water image of the given figure (X) from amongst the four alternatives.



A.1 B.2
C.3 D.4

ANS: Option B



ANS: Option B

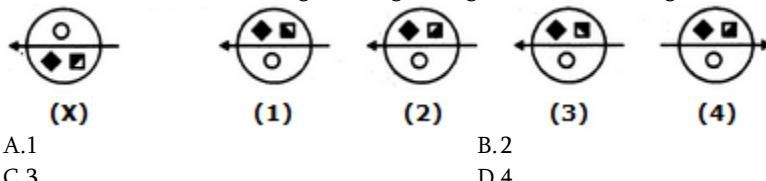
17. ANS: Option A

18. Choose the correct water image of the given figure (X) from amongst the four alternatives.



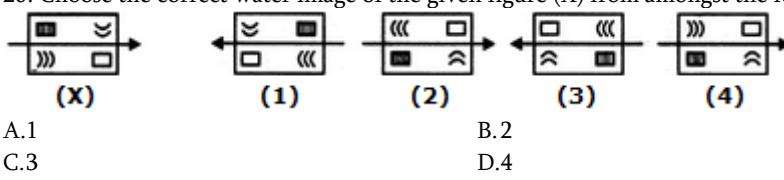
ANS: Option C

19. Choose the correct water image of the given figure (X) from amongst the four alternatives.



ANS: Option A

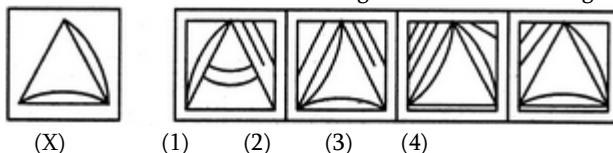
20. Choose the correct water image of the given figure (X) from amongst the four alternatives.



ANS: Option D

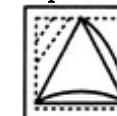
EMBEDDED IMAGES

1. Find out the alternative figure which contains figure (X) as its part.

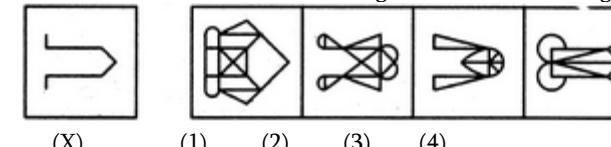


Answer: Option D

Explanation:

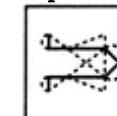


2. Find out the alternative figure which contains figure (X) as its part.

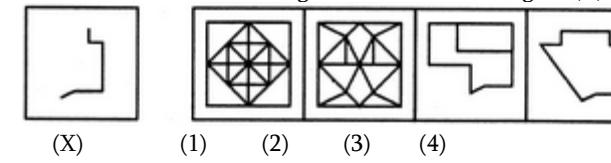


Answer: Option B

Explanation:

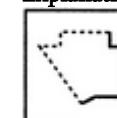


3. Find out the alternative figure which contains figure (X) as its part.

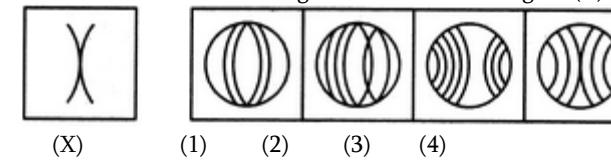


Answer: Option D

Explanation:

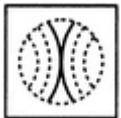


4. Find out the alternative figure which contains figure (X) as its part.

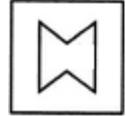


Answer: Option D

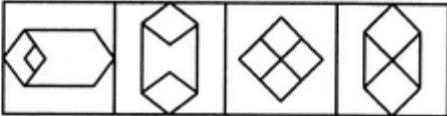
Explanation:



5. Find out the alternative figure which contains figure (X) as its part.



(X)



(1) (2) (3) (4)

A.1

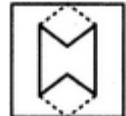
C.3

B.2

D.4

Answer: Option B

Explanation:



6. Find out the alternative figure which contains figure (X) as its part.



(X)



(1) (2) (3) (4)

A.1

C.3

B.2

D.4

Answer: Option B

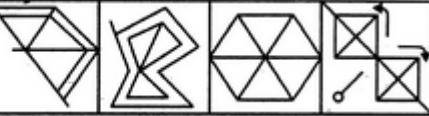
Explanation:



7. Find out the alternative figure which contains figure (X) as its part.



(X)



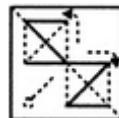
(1) (2) (3) (4)

B.2

D.4

Answer: Option D

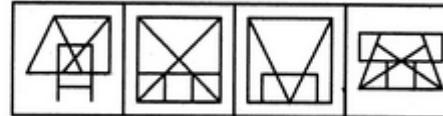
Explanation:



8. Find out the alternative figure which contains figure (X) as its part.



(X)



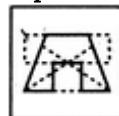
(1) (2) (3) (4)

B.2

C.3

Answer: Option D

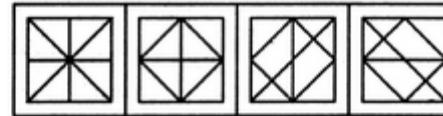
Explanation:



9. Find out the alternative figure which contains figure (X) as its part.



(X)



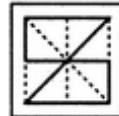
(1) (2) (3) (4)

B.2

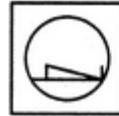
C.3

Answer: Option A

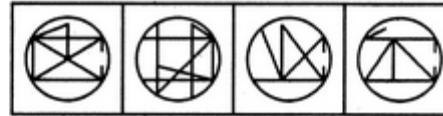
Explanation:



10. Find out the alternative figure which contains figure (X) as its part.



(X)



(1) (2) (3) (4)

B.2

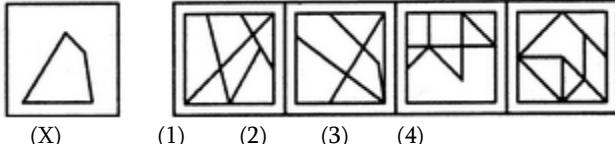
C.3

Answer: Option B

Explanation:

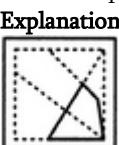


11. Find out the alternative figure which contains figure (X) as its part.

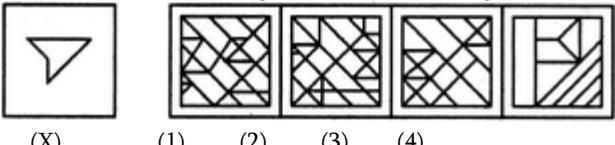


- A.1
C.3
Answer: Option B
B.2
D.4

Explanation:

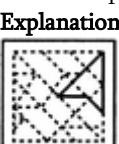


Find out the alternative figure which contains figure (X) as its part.

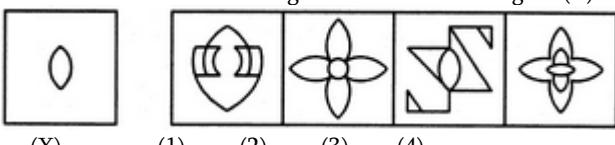


- A.1
C.3
Answer: Option A
B.2
D.4

Explanation:



13. Find out the alternative figure which contains figure (X) as its part.



- A.1
C.3
Answer: Option A
B.2
D.4

A.1

C.3

B.2

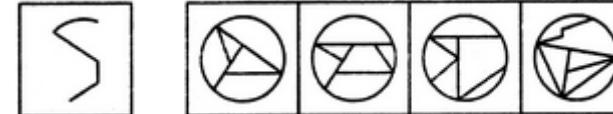
D.4

Answer: Option C

Explanation:

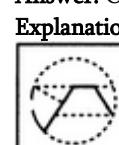


14. Find out the alternative figure which contains figure (X) as its part.

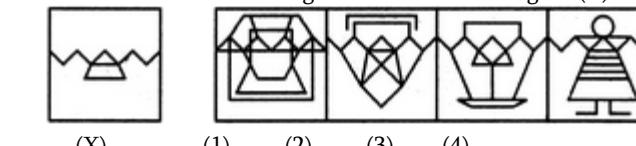


- A.1
C.3
Answer: Option B
B.2
D.4

Explanation:

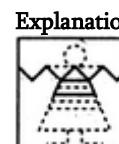


15. Find out the alternative figure which contains figure (X) as its part.

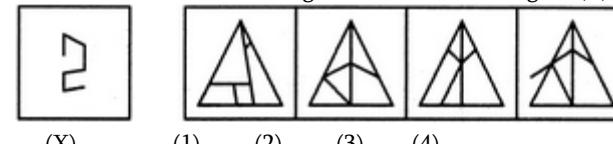


- A.1
C.3
Answer: Option D
B.2
D.4

Explanation:



16. Find out the alternative figure which contains figure (X) as its part.



A.1

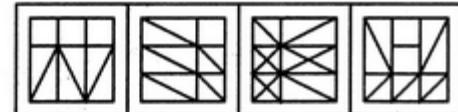
C.3

Answer: Option A

Explanation:



17. Find out the alternative figure which contains figure (X) as its part.

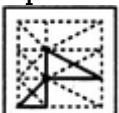


A.1

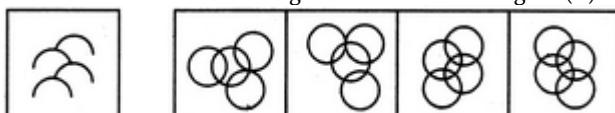
C.3

Answer: Option C

Explanation:



18. Find out the alternative figure which contains figure (X) as its part.

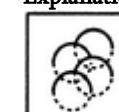


A.1

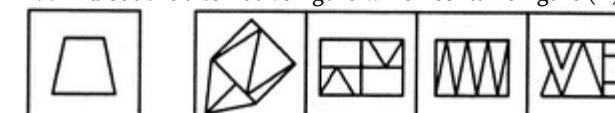
C.3

Answer: Option C

Explanation:



19. Find out the alternative figure which contains figure (X) as its part.



B.2

D.4

A.1

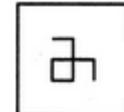
C.3

Answer: Option C

Explanation:



20. Find out the alternative figure which contains figure (X) as its part.



(X)

(1)

(2)

(3)

(4)

B.2

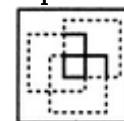
D.4

B.2

D.4

Answer: Option B

Explanation:



GROUPING OF IMAGES

1. Group the given figures into three classes using each figure only once.



A.7,8,9 ; 2,4,3 ; 1,5,6

B. 1,3,2 ; 4,5,7 ; 6,8,9

C. 1,6,8 ; 3,4,7 ; 2,5,9

D.1,6,9 ; 3,4,7 ; 2,5,8

Answer: Option D

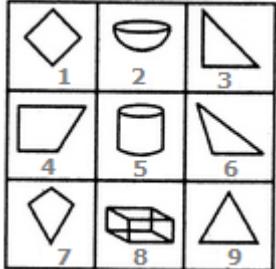
Explanation:

1, 6, 9, are all triangles.

3, 4, 7 are all four-sided figures.

2, 5, 8 are all five-sided figures.

2. Group the given figures into three classes using each figure only once.



A. 1,4,7 ; 2,5,8 ; 3,6,9

B. 1,4,7 ; 2,5,9 ; 3,6,7

C. 1,3,4 ; 2,5,8 ; 6,7,9

D. 1,2,3 ; 4,5,6 ; 7,8,9

Answer: Option A

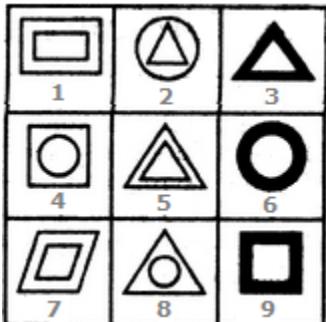
Explanation:

1, 4, 7 are all (two-dimensional) quadrilaterals.

2, 5, 8 are all three-dimensional figures.

3, 6, 9 are all (two-dimensional) triangles.

3. Group the given figures into three classes using each figure only once.



A. 1,5,7 ; 2,4,6 ; 3,9,8

B. 1,5,7 ; 2,4,8 ; 3,6,9

C. 1,4,7 ; 2,5,8 ; 3,6,9

D. 1,7,9 ; 3,5,8 ; 2,4,6

Answer: Option B

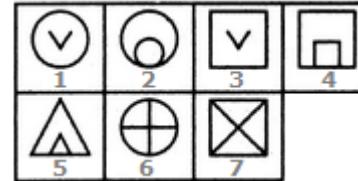
Explanation:

1, 5, 7 have two similar elements, one inside the other.

2, 4, 8 have one element placed inside a different element.

3, 6, 9 have two similar elements, one inside the other and the area between the two elements is shaded.

4. Group the given figures into three classes using each figure only once.



A. 1,2,6 ; 3,4,7 ; 5

B. 1,3 ; 2,6 ; 4,5,7

C. 1,2,6,7 ; 3 ; 4,5

D. 1,3 ; 2,4,5 ; 6,7

Answer: Option D

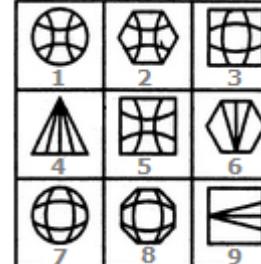
Explanation:

1, 3 contain a V-shaped element inside a geometrical figure.

2, 4, 5 contain two similar elements, one placed inside the other and touching it.

6, 7 contain geometrical figures which are divided into four equal parts by two mutually perpendicular straight lines.

5. Group the given figures into three classes using each figure only once.



A. 1,2,5 ; 3,7,8 ; 4,6,9

B. 1,7,2 ; 3,9,6 ; 4,5,8

C. 2,3,8 ; 4,6,9 ; 1,5,7

D. 5,6,9 ; 3,4,1 ; 2,7,8

Answer: Option A

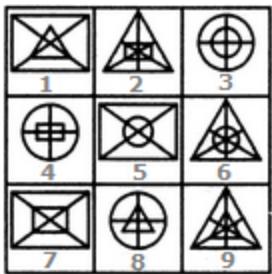
Explanation:

1, 2, 5 are figures that have patterns formed from four lines curved in a concave direction.

3, 7, 8 are figures that have patterns formed from four lines curved in a convex direction.

4, 6, 9 are figures that have patterns formed from these straight lines.

6. Group the given figures into three classes using each figure only once.

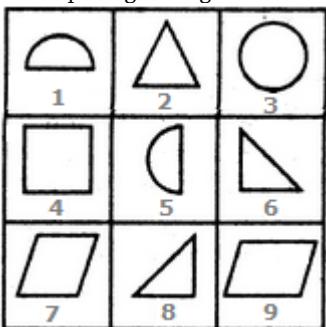


- A.2,4,7 ; 1,8,9 ; 3,5,6
 B.2,6,9 ; 1,5,7 ; 3,4,8
 C.2,6,7 ; 1,5,8 ; 3,4,9
 D.2,8,7 ; 1,5,9 ; 3,4,6

Answer: Option B

Explanation:

- 1, 5, 7 contain a rectangle with its two diagonals as the outer element and another element (similar or different) placed inside it.
 2, 6, 9 contain a triangle with its three medians as the outer element and another element (similar or different) placed inside it.
 3, 4, 8 contain a circle with its two mutually perpendicular diameters as the outer element and another element (similar or different) placed inside it.
 7. Group the given figures into three classes using each figure only once.



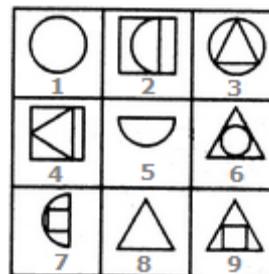
- A.1,3,5 ; 2,6,9 ; 4,7,8
 B.2,3,4 ; 5,6,8 ; 9,1,7
 C.1,3,5 ; 2,6,8 ; 4,7,9
 D.3,2,4 ; 6,5,8 ; 7,9,1

Answer: Option C

Explanation:

- 1, 3, 5 are figures having partially or completely curved boundaries.
 2, 6, 8 are all triangles.
 4, 7, 9 are all quadrilaterals.

8. Group the given figures into three classes using each figure only once.

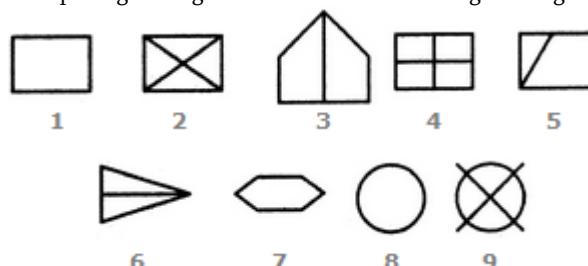


- A.1,5,8 ; 3,4,7 ; 2,6,9
 B.1,3,6 ; 4,5,9 ; 2,7,8
 C.1,3,6 ; 2,5,7 ; 4,8,9
 D.6,7,8 ; 1,3,7 ; 2,4,9

Answer: Option C

Explanation:

- 1, 3, 6 contain one complete circle each.
 2, 5, 7 contain a semi-circle each.
 4, 8, 9 contain a triangle each.
 9.
 Group the given figures into three classes using each figure only once.



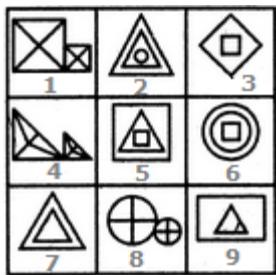
- A.1,2,4 ; 3,5,6 ; 7,8,9
 B.1,7,8 ; 3,5,6 ; 2,4,9
 C.1,3,4 ; 2,8,9 ; 5,6,7
 D.1,7,8 ; 2,3,6 ; 4,5,9

Answer: Option B

Explanation:

- 1, 7, 8 are all undivided geometrical figures.
 3, 5, 6 are geometrical figures divided into two parts.
 2, 4, 9 are geometrical figures divided into four parts.

10. Group the given figures into three classes using each figure only once.



A.1,3,7 ; 2,4,6 ; 5,8,9

B.1,4,6 ; 2,5,7 ; 3,8,9

C.1,4,8 ; 2,5,6 ; 3,7,9

D.1,4,8 ; 2,7,9 ; 3,5,6

Answer: Option C

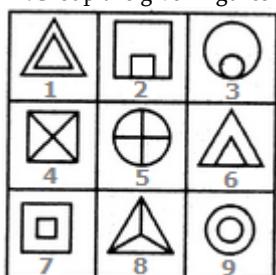
Explanation:

1, 4, 8 contain similar elements (not equal in size) each divided into four parts and attached to each other.

2, 5, 6 contain three elements (two of which are similar) placed one inside the other.

3, 7, 9 contain one element inside the other, which may or may not be similar.

11. Group the given figures into three classes using each figure only once.



A.1,7,9 ; 2,3,6 ; 4,5,8

B.1,2,9 ; 3,4,6 ; 5,7,8

C.1,6,8 ; 2,4,7 ; 3,5,9

D.1,7,8 ; 2,9,3 ; 6,4,5

Answer: Option A

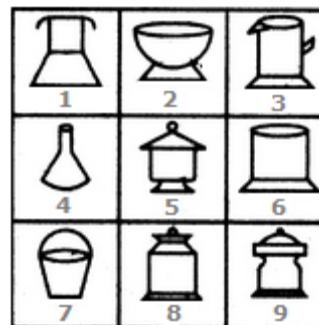
Explanation:

1, 7, 9 contain two similar elements one inside the other but not touching each other.

2, 3, 6 contain two similar elements one inside the other and both touching each other.

4, 5, 8 are divided into equal parts by straight lines emerging from the centre.

12. Group the given figures into three classes using each figure only once.



A.1,4,7 ; 2,5,9 ; 3,8,6

B.2,6,9 ; 1,4,7 ; 5,8,3

C.1,4,7 ; 2,3,6 ; 5,8,9

D.3,5,1 ; 4,7,8 ; 6,2,9

Answer: Option C

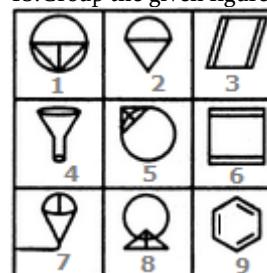
Explanation:

5, 8, 9 are objects having both base as well as upper lid.

2, 3, 6 are objects having base but not upper lid.

1, 4, 7 are objects which have neither a base nor an upper lid attached to them.

13. Group the given figures into three classes using each figure only once.



A.1,5,8 ; 2,6,7 ; 3,4,9

B.1,5,7 ; 2,6,8 ; 3,4,5

C.1,5,8 ; 2,4,7 ; 3,6,9

D.1,5,8 ; 2,6,9 ; 3,4,7

Answer: Option C

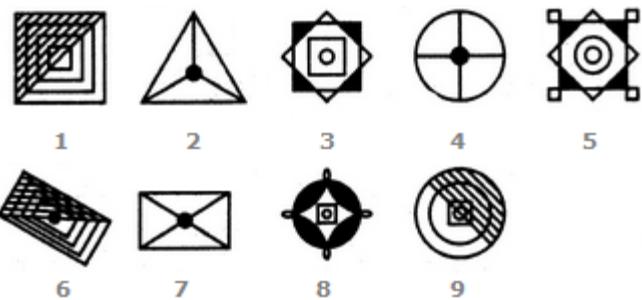
Explanation:

3, 6, 9 are geometrical figures containing line segments (the number of these line segments is half the number of sides in the figure) parallel to the sides of the figure.

1, 5, 8 consist of a circle and a triangle intersecting it. The triangle is also divided into two equal parts by a straight line.

2, 4, 7 are all funnel shaped figures.

14. Group the given figures into three classes using each figure only once.



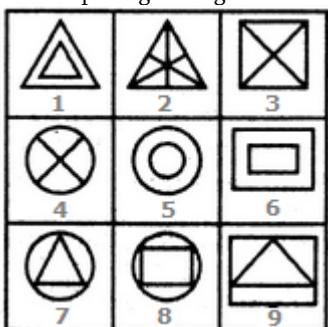
- A.2,4,7 ; 1,6,9 ; 3,5,8
B.1,3,5 ; 2,6,7 ; 4,8,9
C.1,5,7 ; 2,3,6 ; 4,8,9
D.1,3,5 ; 2,4,7 ; 6,8,9

Answer: Option A

Explanation:

- 1, 6, 9 are figures which are half shaded by slanting lines.
2, 4, 7 are all divided into equal parts (either three or four parts) by straight lines and also have a black circle at the centre.
3, 5, 8 have similar designs and have their four corners shaded black.

15. Group the given figures into three classes using each figure only once.



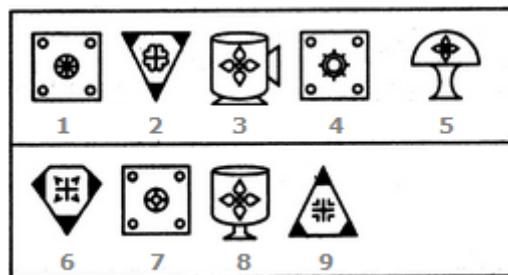
- A.1,2,3 ; 4,5,8 ; 6,7,9
B.1,5,6 ; 2,3,4 ; 7,8,9
C.1,3,5 ; 2,4,8 ; 6,7,9
D.1,4,7 ; 2,5,8 ; 3,6,9

Answer: Option B

Explanation:

- 1, 5, 6 have two similar elements, one inside the other.
2, 3, 4 contain straight lines each dividing, the figure into two equal parts.
7, 8, 9 have one element placed inside a different element.

16. Group the given figures into three classes using each figure only once.



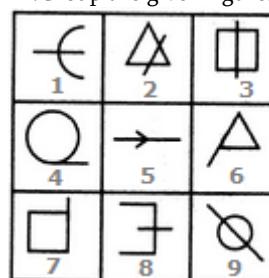
- A.1,4,7 ; 3,6,9 ; 2,5,8
B.1,6,9 ; 2,4,7 ; 3,5,8
C.1,4,7 ; 2,6,9 ; 3,5,8
D.1,5,7 ; 2,6,9 ; 3,4,8

Answer: Option C

Explanation:

- 3, 5, 8 have similar designs (four leaves placed close to a small circle and forming a symmetrical design at the centre of the figure).
2, 6, 9 have similar designs (three of the corners of the main figure are shaded black and there is a pattern formed around a '+' sign at the centre of the figure).
1, 4, 7 have similar designs (there are four small circles at the corners of the main figure and there is a wheel shaped element at the centre of the figure).

17. Group the given figures into three classes using each figure only once.



- A.1,3,9 ; 2,5,8 ; 4,6,7
B.1,5,8 ; 4,6,7 ; 2,3,9
C.2,5,9 ; 1,3,8 ; 2,6,7
D.1,8,9 ; 4,6,7 ; 2,3,5

Answer: Option B

Explanation:

- 1, 5, 8 are all open figures bisected by a line segment.
4, 6, 7 are all closed figures touching a line segment.
2, 3, 9 are all closed figures intersected by a line.

18. Group the given figures into three classes using each figure only once.



7. Find out which of the figures (1), (2), (3) and (4) can be formed from the pieces given in figure (X).

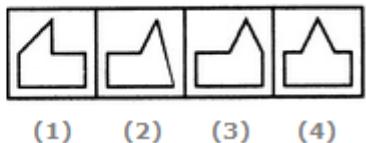


(X)

A.1

C.3

Answer: Option B



(1)

B.2

(2)

D.4

(3)

(4)

Answer: Option B

8. Select the alternative in which the specified components of the key figure (X) are found.

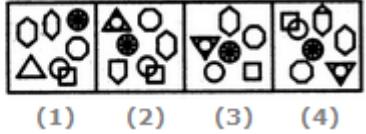


(X)

A.1

C.3

Answer: Option B



(1)

B.2

(2)

D.4

(3)

(4)

Answer: Option B

9. Select the alternative in which the specified components of the key figure (X) are found.



(X)

A.1

C.3

Answer: Option C



(1)

B.2

(2)

D.4

(3)

(4)

Answer: Option C

10. Select the alternative in which the specified components of the key figure (X) are found.

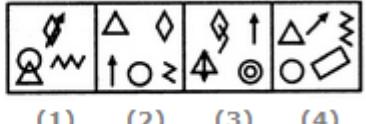


(X)

A.1

C.3

Answer: Option A



(1)

B.2

(2)

D.4

(3)

(4)

11. Select the alternative in which the specified components of the key figure (X) are found.



(X)

A.1

C.3

Answer: Option B



(1)

B.2

(2)

D.4

(3)

(4)

Answer: Option B

12. Select the alternative in which the specified components of the key figure (X) are found.



(X)

A.1

C.3



(1)

B.2

(2)

D.4

(3)

(4)

Answer: Option A

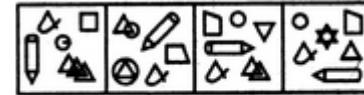
13. Select the alternative in which the specified components of the key figure (X) are found.



(X)

A.1

C.3



(1)

B.2

(2)

D.4

(3)

(4)

Answer: Option C

14. Select the alternative in which the specified components of the key figure (X) are found.



(X)

A.1

C.3



(1)

B.2

(2)

D.4

(3)

(4)

Answer: Option D

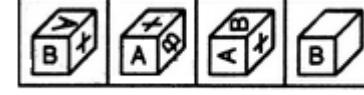
15. Find out how will the key figure (X) look like after rotation.



(X)

A.1

C.3



(1)

B.2

(2)

D.4

(3)

(4)

Answer: Option C

16. Find out how will the key figure (X) look like after rotation.



A.1

C.3

Answer: Option B

17. Find out how will the key figure (X) look like after rotation.



A.1

C.3

Answer: Option D

18. Find out how will the key figure (X) look like after rotation.



A.1

C.3

Answer: Option D

19. Find out how will the key figure (X) look like after rotation.

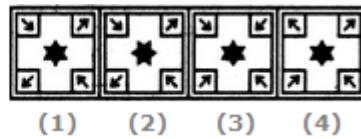


A.1

C.3

Answer: Option D

20. Find out how will the key figure (X) look like after rotation.



(1)

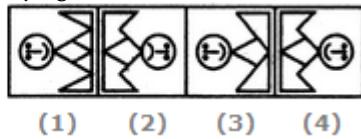
(2)

(3)

(4)

B.2

D.4



(1)

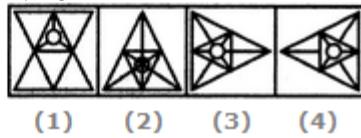
(2)

(3)

(4)

B.2

D.4



(1)

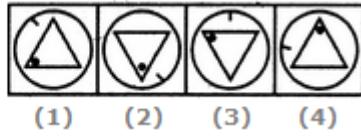
(2)

(3)

(4)

B.2

D.4



(1)

(2)

(3)

(4)

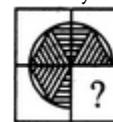
B.2

D.4

Answer: Option B

PATTERN COMPLETION

1. In each of the following questions, select a figure from amongst the four alternatives, which when placed in the blank space of figure (X) would complete the pattern.
Identify the figure that completes the pattern.



(X)



(1)



(2)



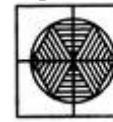
(3)



(4)

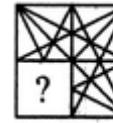
B.2

D.4

Answer: Option C**Explanation:**

2.

- Identify the figure that completes the pattern.



(X)



(1)



(2)



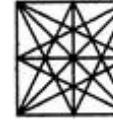
(3)



(4)

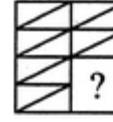
B.2

D.4

Answer: Option D**Explanation:**

3.

- Identify the figure that completes the pattern.



(X)



(1)



(2)



(3)

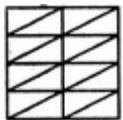


(4)

B.2

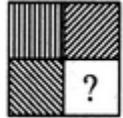
D.4

Answer: Option D**Explanation:**

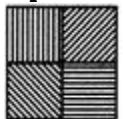


4.

Identify the figure that completes the pattern.

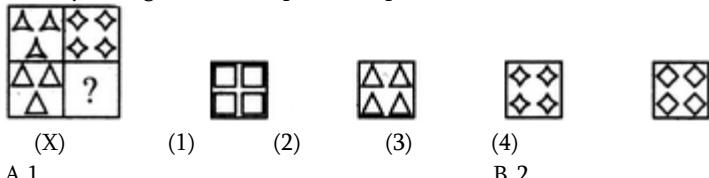


- (X) (1) (2) (3) (4)
- A.1 B.2
C.3 D.4

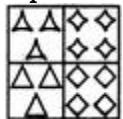
Answer: Option B**Explanation:**

5.

Identify the figure that completes the pattern.

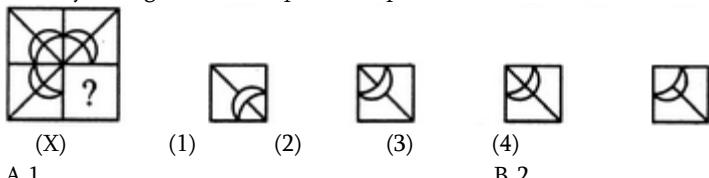


- (X) (1) (2) (3) (4)
- A.1 B.2
C.3 D.4

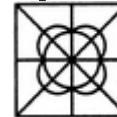
Answer: Option D**Explanation:**

6.

Identify the figure that completes the pattern.

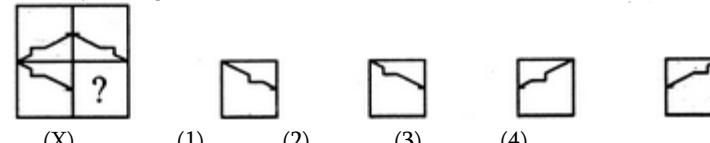


- (X) (1) (2) (3) (4)
- A.1 B.2
C.3 D.4

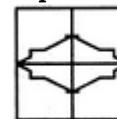
Answer: Option C**Explanation:**

7.

Identify the figure that completes the pattern.

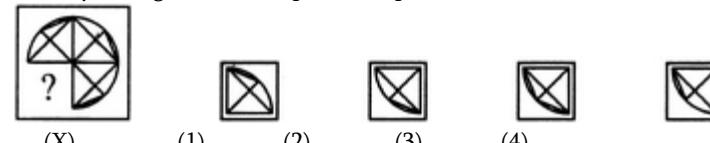


- (X) (1) (2) (3) (4)
- A.1 B.2
C.3 D.4

Answer: Option D**Explanation:**

8.

Identify the figure that completes the pattern.

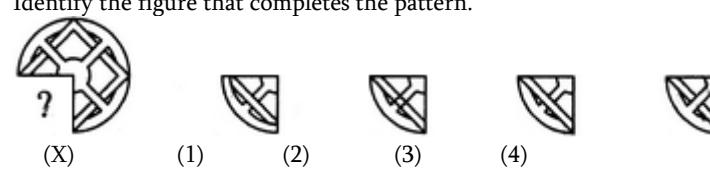


- (X) (1) (2) (3) (4)
- A.1 B.2
C.3 D.4

Answer: Option D**Explanation:**

9.

Identify the figure that completes the pattern.



- (X) (1) (2) (3) (4)
- A.1 B.2

C.3

Answer: Option D

Explanation:



10.

Identify the figure that completes the pattern.



A.1

C.3



(1)



(2)



(3)

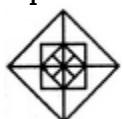


(4)

B.2
D.4

Answer: Option D

Explanation:



11.

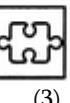
Identify the figure that completes the pattern.



(X)



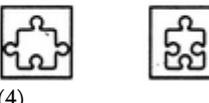
(1)



(2)



(3)

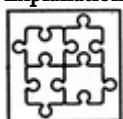


(4)

B.2
D.4

Answer: Option B

Explanation:



D.4

12.

Identify the figure that completes the pattern.



(X)



(1)



(2)



(3)



(4)

B.2

D.4

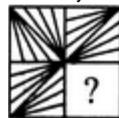
Answer: Option D

Explanation:



13.

Identify the figure that completes the pattern.



(X)



(1)



(2)



(3)



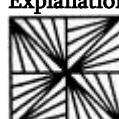
(4)

B.2

D.4

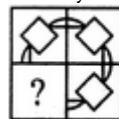
Answer: Option B

Explanation:



14.

Identify the figure that completes the pattern.



(X)



(1)



(2)



(3)



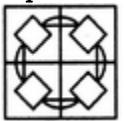
(4)

B.2

D.4

Answer: Option B

Explanation:



15.

Identify the figure that completes the pattern.



A.1
C.3

B.2
D.4

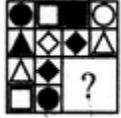
Answer: Option B

Explanation:



16.

Identify the figure that completes the pattern.



A.1
C.3

B.2
D.4

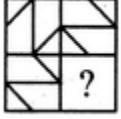
Answer: Option A

Explanation:



17.

Identify the figure that completes the pattern.



A.1

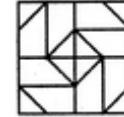
C.3

B.2

D.4

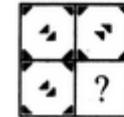
Answer: Option A

Explanation:



18.

Identify the figure that completes the pattern.



(X)

(1)

(2)

(3)

(4)

A.1

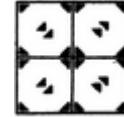
C.3

B.2

D.4

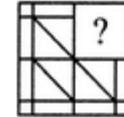
Answer: Option A

Explanation:



19.

Identify the figure that completes the pattern.



(X)

(1)

(2)

(3)

(4)

A.1

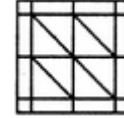
C.3

B.2

D.4

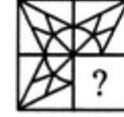
Answer: Option B

Explanation:



20.

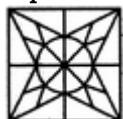
Identify the figure that completes the pattern.



- | | | | | |
|-----|-----|-----|-----|-----|
| (X) | (1) | (2) | (3) | (4) |
| A.1 | | | B.2 | |
| C.3 | | | D.4 | |

Answer: Option A

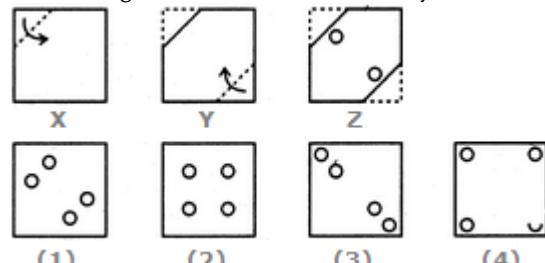
Explanation:



PAPER CUTTING

Each of the following questions consists of a set of three figures X, Y and Z showing a sequence of folding of a piece of paper. Figure (Z) shows the manner in which the folded paper has been cut. These three figures are followed by four answer figures from which you have to choose a figure which would most closely resemble the unfolded form of figure (Z).

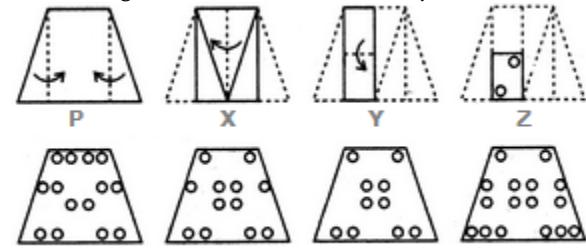
1. Choose a figure which would most closely resemble the unfolded form of Figure (Z).



- | | | | |
|-----|--|-----|--|
| A.1 | | B.2 | |
| C.3 | | D.4 | |

Answer: Option C

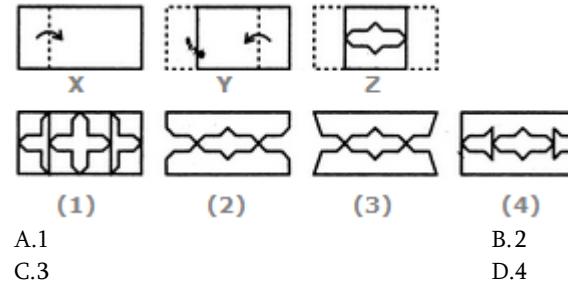
2. Choose a figure which would most closely resemble the unfolded form of Figure (Z).



- | | | | |
|-----|--|-----|--|
| A.1 | | B.2 | |
| C.3 | | D.4 | |

Answer: Option C

3. Choose a figure which would most closely resemble the unfolded form of Figure (Z).

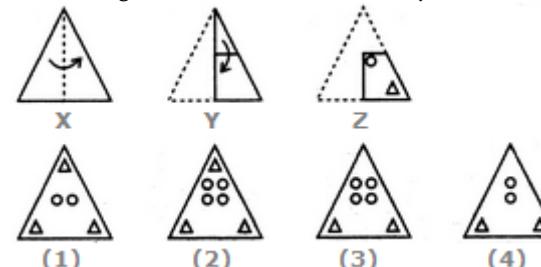


- | | | | |
|-----|--|-----|--|
| A.1 | | B.2 | |
| C.3 | | D.4 | |

Answer: Option B

4.

- Choose a figure which would most closely resemble the unfolded form of Figure (Z).

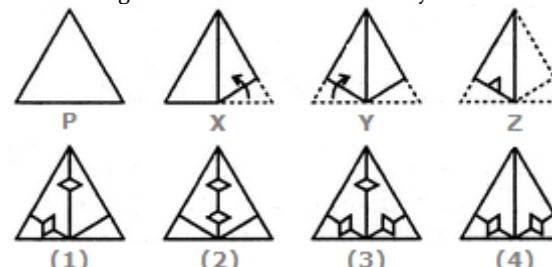


- | | | | |
|-----|--|-----|--|
| A.1 | | B.2 | |
| C.3 | | D.4 | |

Answer: Option C

5.

- Choose a figure which would most closely resemble the unfolded form of Figure (Z).

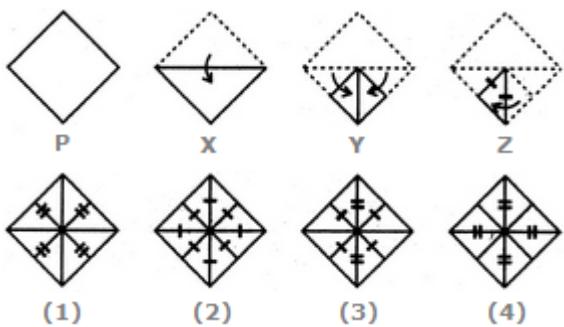


- | | | | |
|-----|--|-----|--|
| A.1 | | B.2 | |
| C.3 | | D.4 | |

Answer: Option D

6.

- Choose a figure which would most closely resemble the unfolded form of Figure (Z).

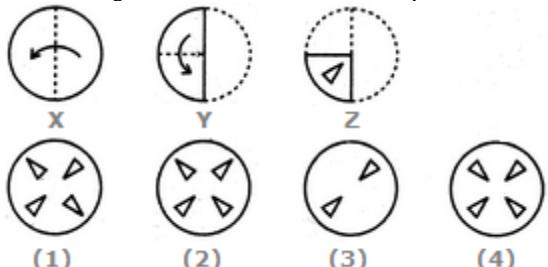


- A.1
 - C.3
 - B.2
 - D.4

Answer: Option B

7.

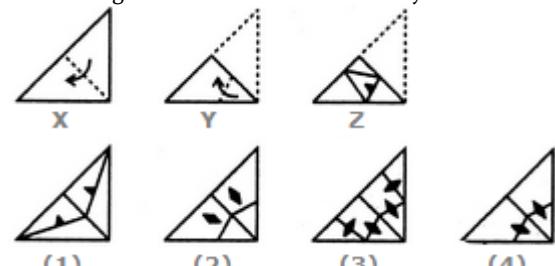
Choose a figure which would most closely resemble the unfolded form of Figure (Z).



Answer: Option D

8.

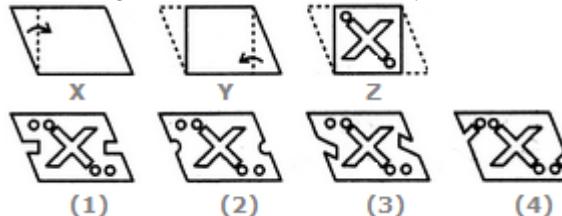
Choose a figure which would most closely resemble the unfolded form of Figure (Z).



Answer: Option D

9

Choose a figure which would most closely resemble the unfolded form of Figure (Z).

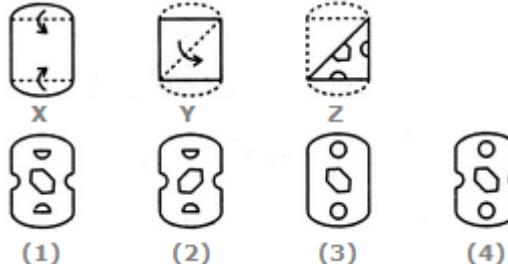


- A.1
 - C.3

Answer: Option D

10.

Choose a figure which would most closely resemble the unfolded form of Figure (Z).

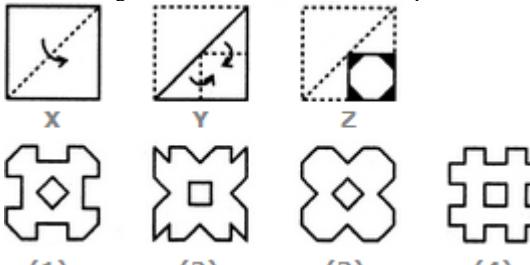


- A.1
 - C.3
 - B.2
 - D.4

Answer: Option D

11.

Choose a figure which would most closely resemble the unfolded form of Figure (Z).

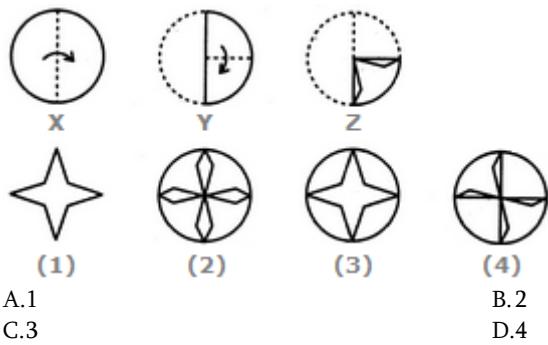


- (1) A.1 (2) C.3 (3) B.2 (4) D.4

C.3

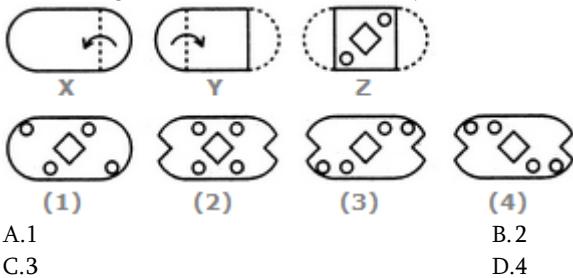
12

Choose a figure which would most closely resemble the unfolded form of Figure (7).



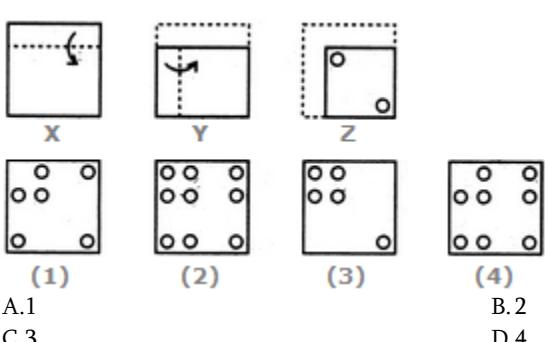
13.

Choose a figure which would most closely resemble the unfolded form of Figure (Z).



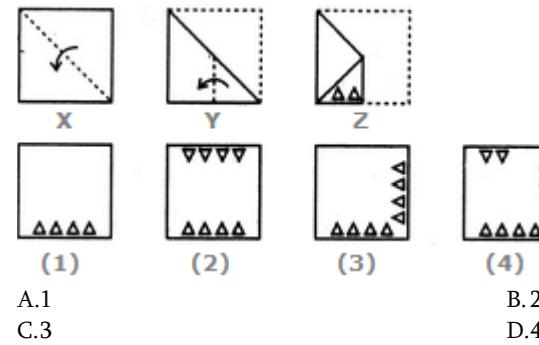
14.

Choose a figure which would most closely resemble the unfolded form of Figure (Z).



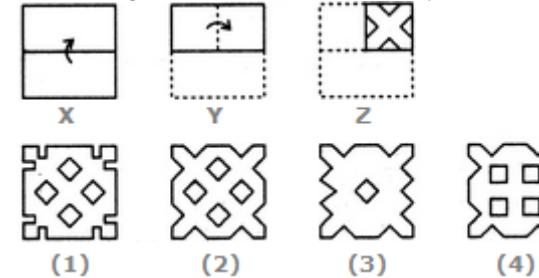
15.

Choose a figure which would most closely resemble the unfolded form of Figure (Z).



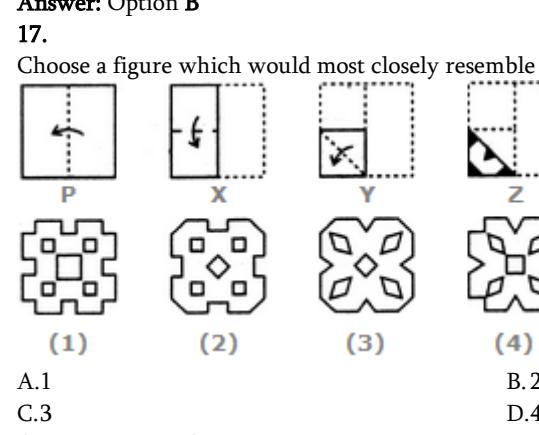
16.

Choose a figure which would most closely resemble the unfolded form of Figure (Z).



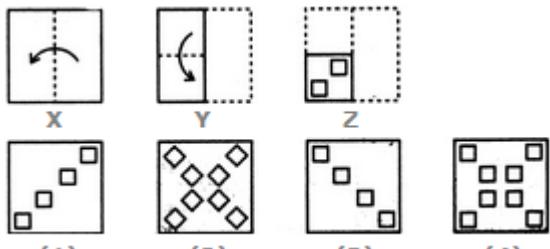
17.

Choose a figure which would most closely resemble the unfolded form of Figure (Z).



18.

Choose a figure which would most closely resemble the unfolded form of Figure (Z).

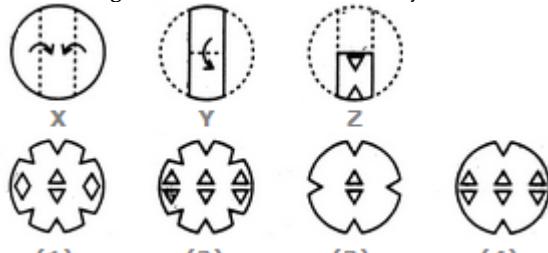


- A.1
C.3
B.2
D.4

Answer: Option D

19.

Choose a figure which would most closely resemble the unfolded form of Figure (Z).

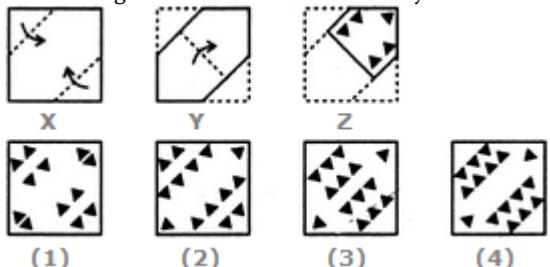


- A.1
C.3
B.2
D.4

Answer: Option D

20.

Choose a figure which would most closely resemble the unfolded form of Figure (Z).



- A.1
C.3
B.2
D.4

Answer: Option B

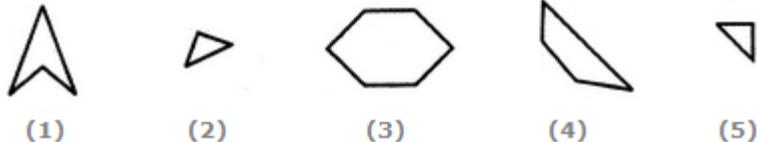
SHAPE CONSTRUCTION

In each of the following questions, a set of five alternative figures 1, 2, 3, 4 and 5 followed by a set of four alternatives (A), (B), (C) and (D) is provided. It is required to select the alternative

which represents three out of the five alternative figures which when fitted into each other would form a complete square.

1.

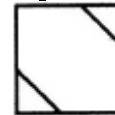
Select the alternative which represents three out of the five alternative figures which when fitted into each other would form a complete square.



- A.124
C.345
B.234
D.235

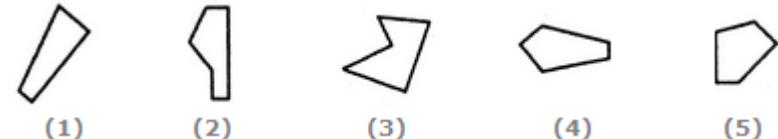
Answer: Option D

Explanation:



2.

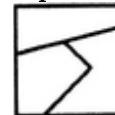
Select the alternative which represents three out of the five alternative figures which when fitted into each other would form a complete square.



- A.135
C.145
B.123
D.234

Answer: Option A

Explanation:



3.

Select the alternative which represents three out of the five alternative figures which when fitted into each other would form a complete square.



- A.123
C.345
B.234
D.245

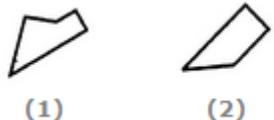
Answer: Option C

Explanation:

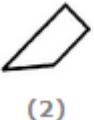


4.

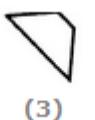
Select the alternative which represents three out of the five alternative figures which when fitted into each other would form a complete square.



(1)



(2)



(3)



(4)



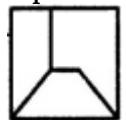
(5)

A.123

C.134

Answer: Option D

Explanation:



5.

Select the alternative which represents three out of the five alternative figures which when fitted into each other would form a complete square.



(1)



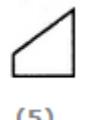
(2)



(3)



(4)



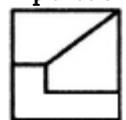
(5)

A.123

C.135

Answer: Option C

Explanation:



6.

Select the alternative which represents three out of the five alternative figures which when fitted into each other would form a complete square.



(1)



(2)



(3)



(4)



(5)

A.145

C.134

Answer: Option B

Explanation:



7.

Select the alternative which represents three out of the five alternative figures which when fitted into each other would form a complete square.



(1)



(2)



(3)



(4)



(5)

A.145

C.235

Answer: Option D

Explanation:



8.

Select the alternative which represents three out of the five alternative figures which when fitted into each other would form a complete square.



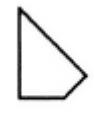
(1)



(2)



(3)



(4)



(5)

A.134

C.234

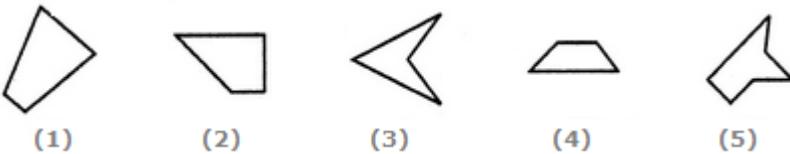
Answer: Option A

Explanation:



9.

Select the alternative which represents three out of the five alternative figures which when fitted into each other would form a complete square.

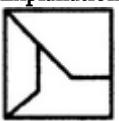


A.123

C.245

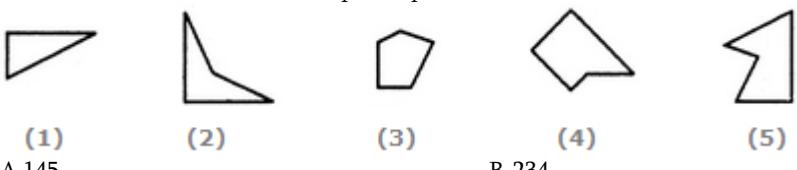
Answer: Option C

Explanation:



10.

Select the alternative which represents three out of the five alternative figures which when fitted into each other would form a complete square.

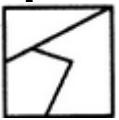


A.145

C.245

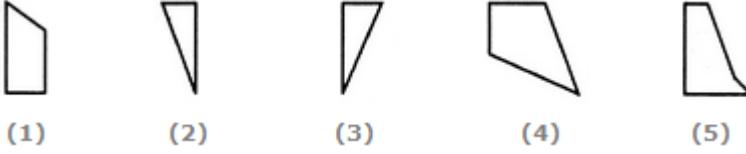
Answer: Option D

Explanation:



11.

Select the alternative which represents three out of the five alternative figures which when fitted into each other would form a complete square.



A.123

C.234

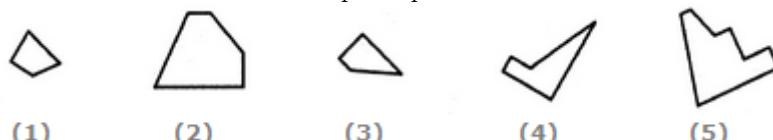
Answer: Option C

Explanation:



12.

Select the alternative which represents three out of the five alternative figures which when fitted into each other would form a complete square.

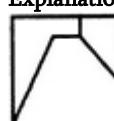


A.124

C.345

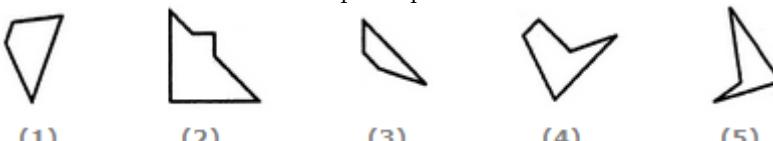
Answer: Option B

Explanation:



13.

Select the alternative which represents three out of the five alternative figures which when fitted into each other would form a complete square.



A.123

C.125

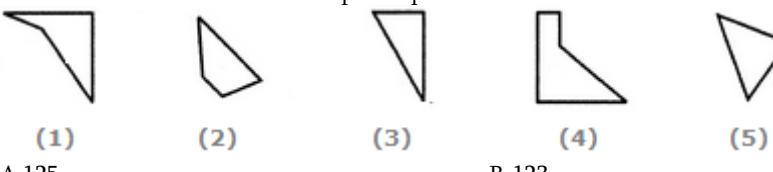
Answer: Option A

Explanation:



14.

Select the alternative which represents three out of the five alternative figures which when fitted into each other would form a complete square.



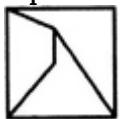
A.125

B.123

C.235

Answer: Option A

Explanation:



15.

Select the alternative which represents three out of the five alternative figures which when fitted into each other would form a complete square.



(1)



(2)



(3)



(4)



(5)

A.123

C.135

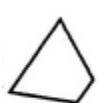
Answer: Option B

Explanation:



16.

Select the alternative which represents three out of the five alternative figures which when fitted into each other would form a complete square.



(1)



(2)



(3)



(4)



(5)

A.123

C.124

Answer: Option C

Explanation:



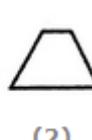
17.

Select the alternative which represents three out of the five alternative figures which when fitted into each other would form a complete square.

D.234



(1)



(2)



(3)



(4)



(5)

A.123

C.235

Answer: Option B

Explanation:



18.

Select the alternative which represents three out of the five alternative figures which when fitted into each other would form a complete square.



(1)



(2)



(3)



(4)



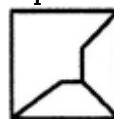
(5)

B.134

D.345

Answer: Option D

Explanation:



19.

Select the alternative which represents three out of the five alternative figures which when fitted into each other would form a complete square.



(1)



(2)



(3)



(4)



(5)

B.145

D.124

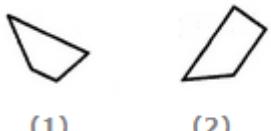
Answer: Option B

Explanation:



20.

Select the alternative which represents three out of the five alternative figures which when fitted into each other would form a complete square.



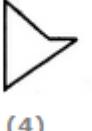
(1)



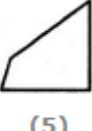
(2)



(3)



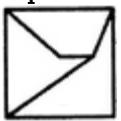
(4)



(5)

A.123

C.134

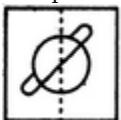
Answer: Option C**Explanation:**

PAPER FOLDING

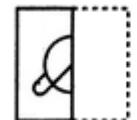
In each of the following problems, a square transparent sheet (X) with a pattern is given. Figure out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.

1.

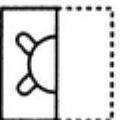
Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.



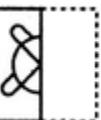
(X)



(1)



(2)



(3)

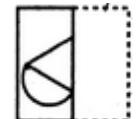
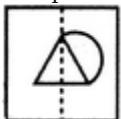
B.2

D.4

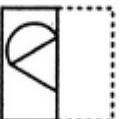
Answer: Option D

2.

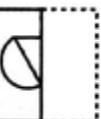
Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.



(1)



(2)



(3)

- | | | | | |
|-----|-----|-----|-----|-----|
| (X) | (1) | (2) | (3) | (4) |
| A.1 | | | B.2 | |
| C.3 | | | D.4 | |

Answer: Option C

3.

Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.



(X)



(1)



(2)



(3)



(4)

B.2

D.4

Answer: Option D

4.

Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.



(X)



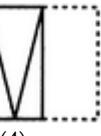
(1)



(2)



(3)



(4)

B.2

D.4

Answer: Option D

5.

Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.



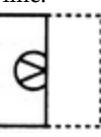
(X)



(1)



(2)



(3)



(4)

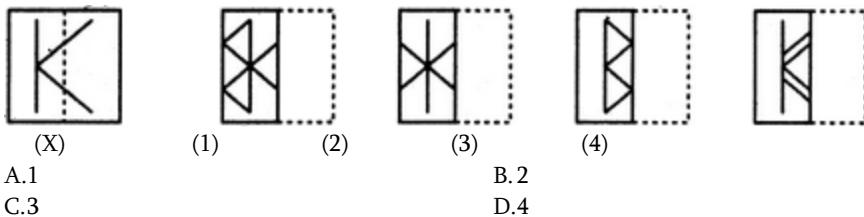
B.2

D.4

Answer: Option A

6.

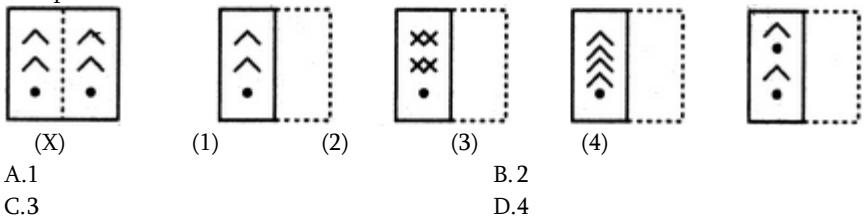
Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.



Answer: Option C

7.

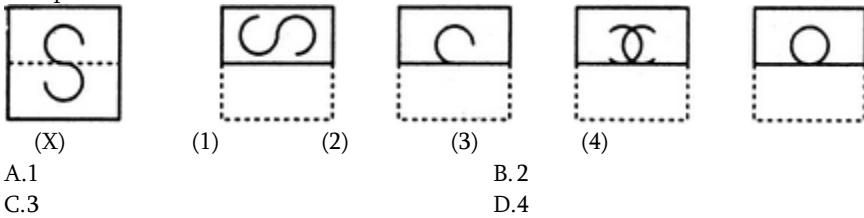
Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.



Answer: Option A

8.

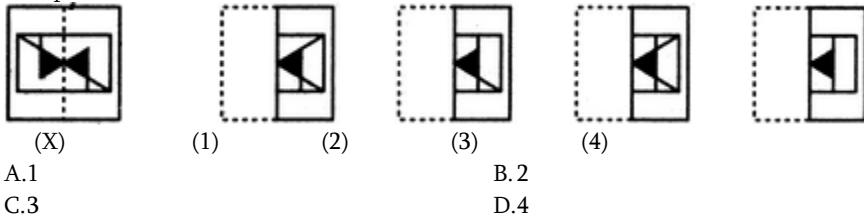
Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.



Answer: Option D

9.

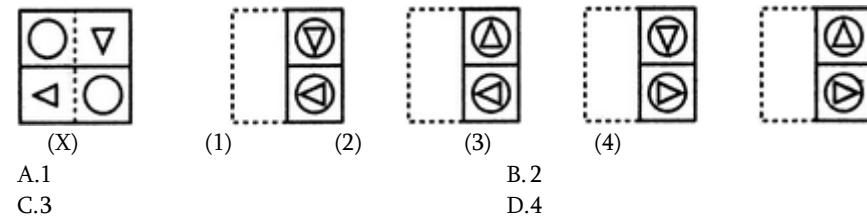
Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.



Answer: Option C

10.

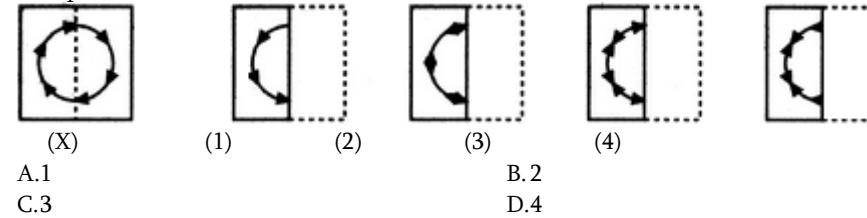
Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.



Answer: Option C

11.

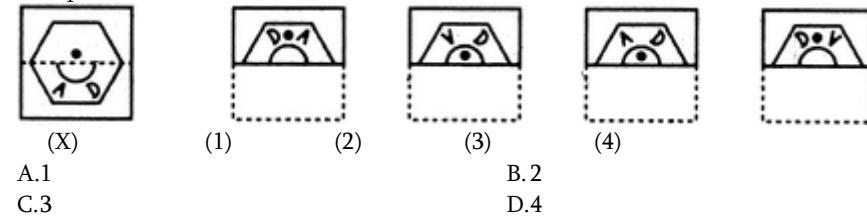
Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.



Answer: Option C

12.

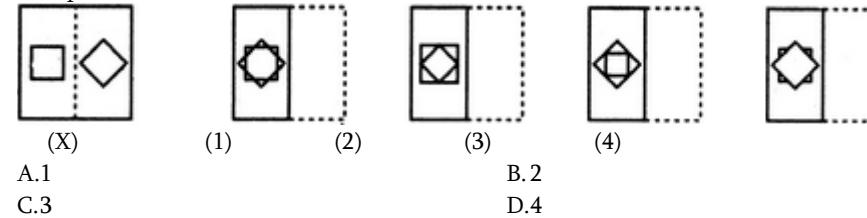
Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.



Answer: Option B

13.

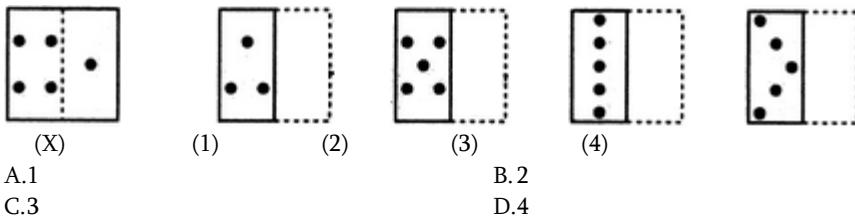
Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.



Answer: Option A

14.

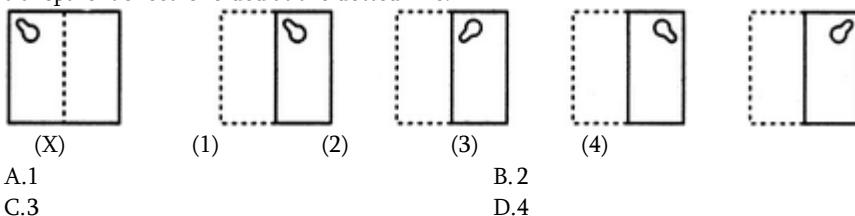
Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.



Answer: Option B

15.

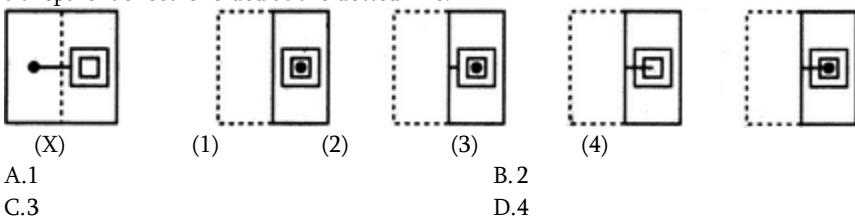
Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.



Answer: Option D

16.

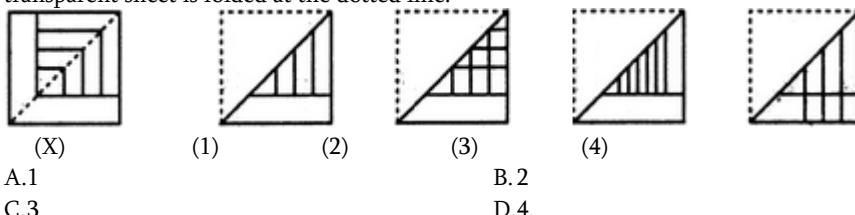
Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.



Answer: Option D

17.

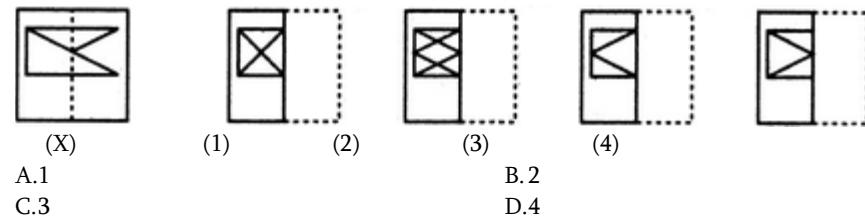
Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.



Answer: Option A

18.

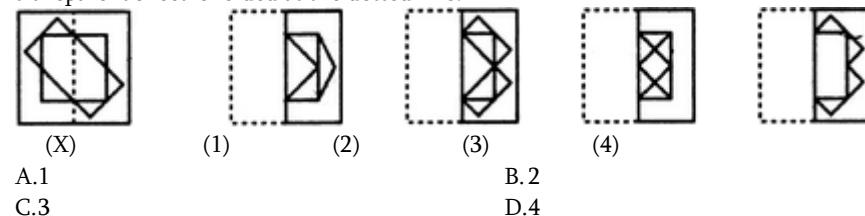
Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.



Answer: Option D

19.

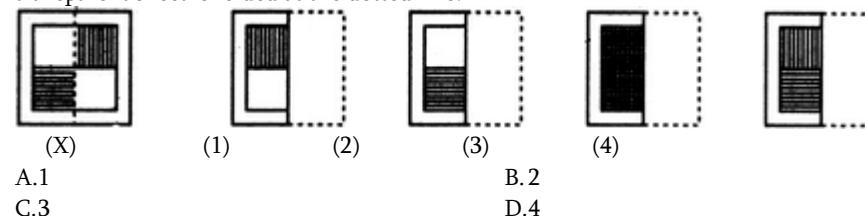
Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.



Answer: Option B

20.

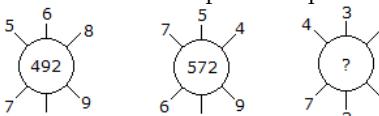
Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.



Answer: Option D

CHARACTER PUZZLES

1. Which one will replace the question mark?



- A.115
C.135
B.130
D.140

Answer: Option B

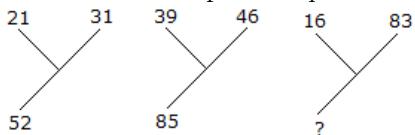
Explanation:

$$(5 \times 6 \times 8) + (7 \times 4 \times 9) = 492$$

$$\text{and } (7 \times 5 \times 4) + (6 \times 8 \times 9) = 572$$

Therefore $(4 \times 3 \times 5) + (7 \times 2 \times 5) = 130$.

2. Which one will replace the question mark ?



- A. 92 B. 72
C. 62 D. 99

Answer: Option D

Explanation:

$$21 + 31 = 52$$

$$\text{and } 39 + 46 = 85$$

$$\text{Therefore, } 16 + 83 = 99.$$

3. Which one will replace the question mark ?

A ₂	C ₄	E ₆
G ₃	I ₅	?
M ₅	O ₉	Q ₁₄

Answer: Option D

Explanation:

How the number is obtained?

$$2 + 4 = 6$$

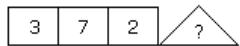
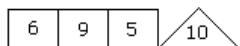
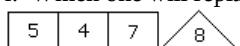
$$5 + 9 = 14$$

Similarly,

$$3 + 5 = 8$$

Therefore, the answer is K8.

4. Which one will replace the question mark ?



- A. 1 B. 4
C. 3 D. 6

Answer: Option D

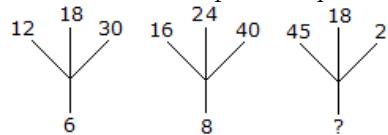
Explanation:

$$(5 + 4 + 7)/2 = 8$$

$$(6 + 9 + 5)/2 = 10$$

$(3 + 7 + 2)/2 = 6$.

5. Which one will replace the question mark ?



- A. 18 B. 12
C. 9 D. 6

Answer: Option C

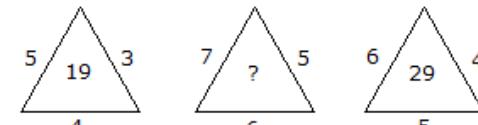
Explanation:

$$(12 + 18 + 30)/10 = 6$$

$$(16 + 24 + 40)/10 = 8$$

$$\text{Similarly, } (45 + 18 + 27)/10 = 9.$$

6. Which one will replace the question mark ?



- A. 25 B. 37
C. 41 D. 47

Answer: Option C

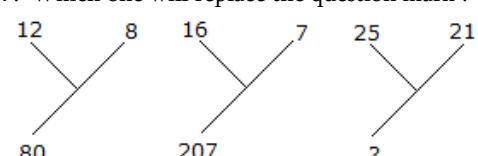
Explanation:

$$(5 \times 3) + 4 = 19$$

$$\text{and } (6 \times 4) + 5 = 29$$

$$\text{Therefore, } (7 \times 5) + 6 = 41$$

7. Which one will replace the question mark ?



- A. 184 B. 210
C. 241 D. 425

Answer: Option A

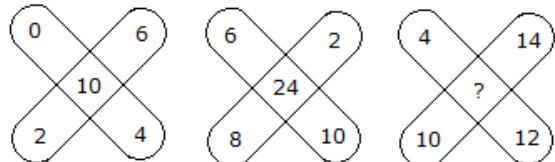
Explanation:

$$(12)^2 - (8)^2 = 80$$

$$\text{and } (16)^2 - (7)^2 = 207$$

$$\text{Therefore } (25)^2 - (21)^2 = 184.$$

8. Which one will replace the question mark ?



- A. 36
B. 48
C. 38
D. 30

Answer: Option C

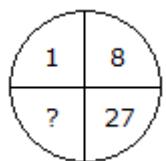
Explanation:

$$(0 + 2 + 6 + 4) - 2 = 10$$

$$\text{and } (6 + 2 + 10 + 8) - 2 = 24$$

$$\text{Therefore, } (4 + 14 + 12 + 10) - 2 = 38.$$

9. Which one will replace the question mark ?



- A. 41
B. 64
C. 35
D. 61

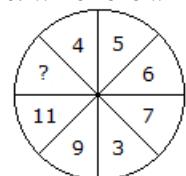
Answer: Option B

Explanation:

$$(1)^3 = 1, (2)^3 = 8, (3)^3 = 27$$

$$\text{Therefore, } (4)^3 = 64.$$

10. Which one will replace the question mark ?



- A. 13
B. 14
C. 12
D. 15

Answer: Option D

Explanation:

$$\text{Sum of numbers in lower half of the circle} = 11 + 9 + 3 + 7 = 30$$

$$\text{Sum of numbers in upper half of the circle} = ? + 4 + 5 + 6 = ? + 15$$

$$\text{Upper half} = \text{Lower half}$$

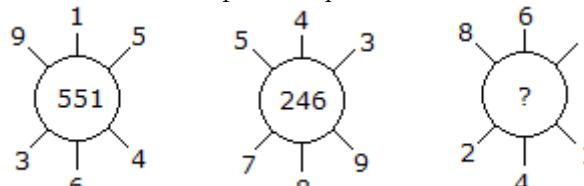
$$30 = ? + 15$$

$$? = 30 - 15$$

$$? = 15.$$

Therefore, 15 is the answer.

11. Which one will replace the question mark ?



- A. 262
B. 622
C. 631
D. 824

Answer: Option B

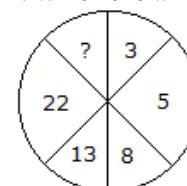
Explanation:

$$915 - 364 = 551$$

$$\text{and } 789 - 543 = 246$$

$$\text{Similarly, } 863 - 241 = 622.$$

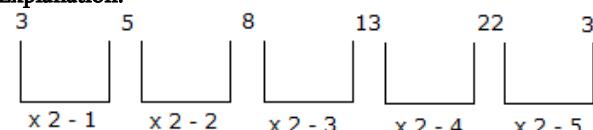
12. Which one will replace the question mark ?



- A. 45
B. 29
C. 39
D. 37

Answer: Option C

Explanation:



13. Which one will replace the question mark ?

2	4	0
1	2	4
3	1	3
36	?	91

- A.25 B.59
C.48 D.73

Answer: Option D

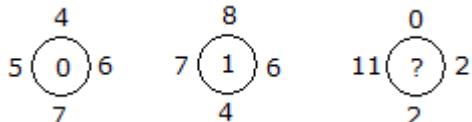
Explanation:

$$(2)^3 + (1)^3 + (3)^3 = 36$$

$$\text{and } (0)^3 + (4)^3 + (3)^3 = 91$$

$$\text{Therefore, } (4)^3 + (2)^3 + (1)^3 = 73.$$

14. Which one will replace the question mark ?



- A.0 B.2
C.11 D.12

Answer: Option C

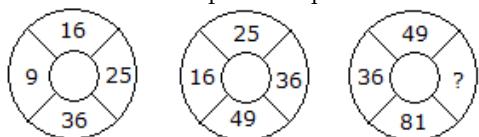
Explanation:

$$(6 + 5) - (7 + 4) = 0$$

$$\text{and } (7 + 6) - (8 + 4) = 1$$

$$\text{Therefore } (11 + 2) - (2 + 0) = 11.$$

15. Which one will replace the question mark ?



- A.64 B.144
C.169 D.25

Answer: Option A

Explanation:

The numbers are squared in ascending order

In first circle,

$$(3)^2 = 9$$

$$(4)^2 = 16$$

$$(5)^2 = 25$$

$$(6)^2 = 36.$$

In second circle,

$$(4)^2 = 16$$

$$(5)^2 = 25$$

$$(6)^2 = 36$$

$$(7)^2 = 49.$$

In third circle,

$$(6)^2 = 36$$

$$(7)^2 = 49$$

$$(8)^2 = 64$$

$$(9)^2 = 81.$$

16. Which one will replace the question mark ?

4	5	6
2	3	7
1	8	3
21	98	?

- A.94 B.76
C.16 D.73

Answer: Option A

Explanation:

$$(4)^2 + (2)^2 + (1)^2 = 21$$

$$\text{and } (5)^2 + (3)^2 + (8)^2 = 98$$

$$\text{Therefore } (6)^2 + (7)^2 + (3)^2 = 94.$$

17. Which one will replace the question mark ?

7	4	5
8	7	6
3	3	?
29	19	31

- A.3 B.5
C.4 D.6

Answer: Option B

Explanation:

$$(7 \times 3) + 8 = 29$$

$$(4 \times 3) + 7 = 19$$

$$(5 \times ?) + 6 = 31$$

? = 5.

18. Which one will replace the question mark ?

3	15	4
7	38	5
3	?	5

- A. 15 B. 19
C. 20 D. 18

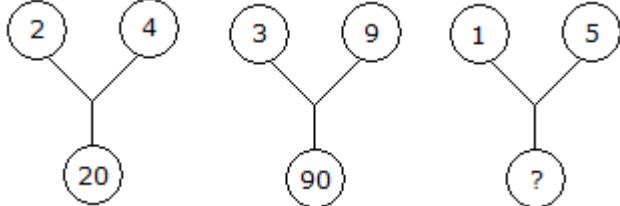
Answer: Option D

Explanation:

$$(3 \times 4) + 3 = 15$$
$$\text{and } (7 \times 5) + 3 = 38$$

Therefore $(3 \times 5) + 3 = 18$.

19. Which one will replace the question mark ?



- A. 75 B. 26
C. 25 D. 20

Answer: Option B

Explanation:

$$(2)^2 + (4)^2 = 20$$
$$\text{and } (3)^2 + (9)^2 = 90$$

Therefore $(1)^2 + (5)^2 = 26$.

20. Which one will replace the question mark ?

7	9	21	27
4	2	36	18
9	4	54	?

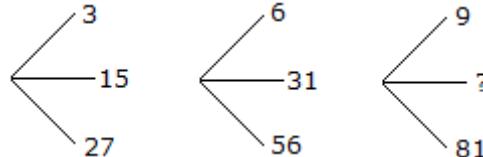
- A. 18 B. 24
C. 36 D. 58

Answer: Option B

Explanation:

$$(7 \times 3) = 21 \text{ and } (9 \times 3) = 27$$
$$\text{and } (4 \times 9) = 36 \text{ and } (2 \times 9) = 18$$
$$\text{Therefore } (9 \times 6) = 54 \text{ and } (4 \times 6) = 24.$$

21. Which one will replace the question mark ?



- A. 45 B. 41
C. 32 D. 40

Answer: Option A

Explanation:

$$(15 - 3) = 12$$
$$(31 - 6) = 25$$
$$\text{and } (45 - 9) = 36$$

22. Which one will replace the question mark ?

4	6	3	8
---	---	---	---

6	10	5	12
---	----	---	----

4	8	2	?
---	---	---	---

- A. 8 B. 12
C. 16 D. 20

Answer: Option C

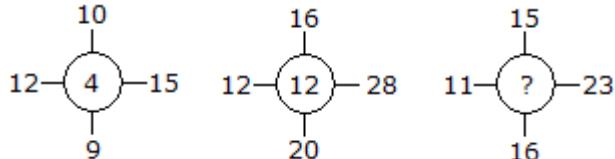
Explanation:

$$(4 \times 6) \% 3 = 8$$

$$(6 \times 10) \% 5 = 12$$

$$(4 \times 8) \% 2 = 16.$$

23. Which one will replace the question mark ?



- A. 11 B. 14
C. 10 D. 12

Answer: Option A

Explanation:

$$(15 - 12) + (10 - 9) = 4$$

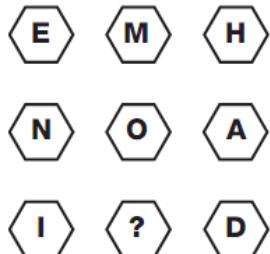
$$(28 - 12) + (16 - 20) = 12$$

Similarly, $(23 - 11) + (15 - 16) = 11$.

MISSING LETTERS PUZZLES

1)

Which letter replaces the question mark?



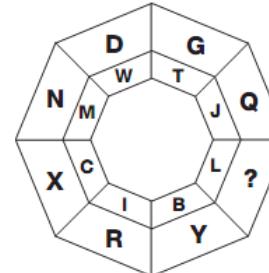
Answer: M

Explanation:

Working in rows, add together the numerical values of the left and right hand letters to give the numerical value of the central letter.

2)

Which letter replaces the question mark?



Answer: O

Explanation:

In each segment of the diagram are a pair of letters, one of which is the same distance from the start of the alphabet as the other is from the end.

3)

Which letter replaces the question mark?



Answer : K

Explanation:

As you move down, the numerical value of the letters follows the sequence of Prime Numbers.

4)

Which letter replaces the question mark?



Answer : W

Explanation:

Working from left to right, letters move forwards 7 places, then back 2. Repeat this sequence until the end.

5)

Which letter replaces the question mark?



Answer : G

Explanation:

The numerical values of the letters in each row add up to 26 each time.

6)

Which letter replaces the question mark?



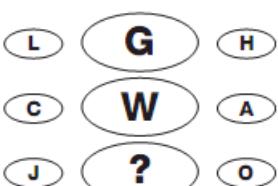
Answer : W

Explanation:

Starting at the top left and moving down, then right one column and up etc in a snakes and ladders pattern, letters move through the alphabet 4 letters at a time.

7)

Which letter replaces the question mark?



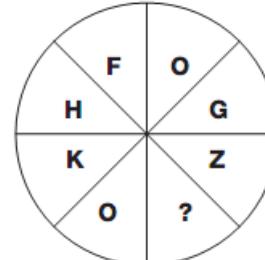
Answer: B

Explanation:

In each row, add the numerical value of the left and right hand letters together and write the letter with the reverse alphabetical value in the centre.

8)

Which letter replaces the question mark?



Answer: T

Explanation:

Starting at F and moving anti-clockwise, letters move through the alphabet in steps of 2, 3, 4, 5 etc.

9)

Which letter replaces the question mark?



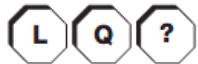
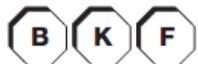
Answer: P

Explanation :

Starting at the top left circle, and moving right, then down one row and moving left, in a snakes and ladders pattern, letters move through the alphabet in steps of 2, 3 and 4, repeating this pattern all the way down.

10)

Which letter replaces the question mark?



Answer: V

Explanation :

Starting at the top left, and moving anti-clockwise around the figure, letters advance through the alphabet 5 letters at a time.

11)

Which letter replaces the question mark?



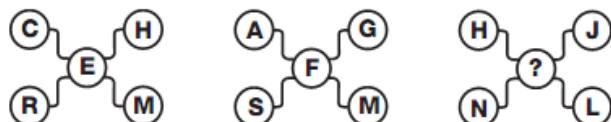
Answer: 1

Explanation:

Working from left to right, letters in corresponding segments of the circles move through the alphabet in steps of 2, 3 and 4, with their relative positions moving one place clockwise at each step.

12)

Which letter replaces the question mark?



Answer:B

Explanation:

In each diagram, letters are written in sequence, starting in the top left circle and moving clockwise around the other 3 outer circles, in steps given by the numerical value of the central letter each time.

13)

Which letter replaces the question mark?



Answer :E

Explanation:

Using the numerical value of each letter, in each column, the value of the central letter equals the sum of the values of the top and bottom letters.

14)

Which letter replaces the question mark?



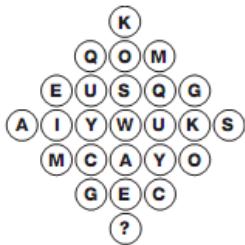
Answer: N

Explanation :

The alphabetical value of the letters in the left hand column follows through the sequence of Prime Numbers, with the letters in the right hand column representing the corresponding reverse alphabetical values.

15)

Which letter replaces the question mark?



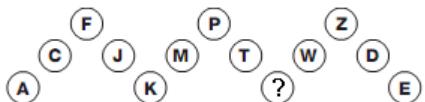
Answer: I

Explanation:

Starting on the left, and moving downwards in columns from left to right, letters are written in alphabetical sequence, in steps of 4 letters at a time.

16)

Which letter replaces the question mark?



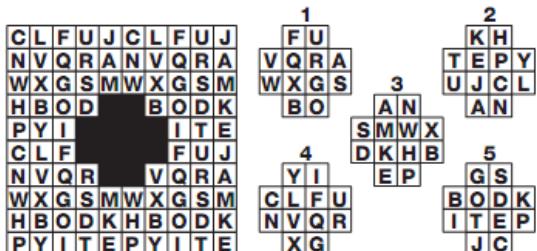
Answer: U

Explanation:

Starting on the left, and moving along the line to the right, letters follow the alphabetic sequence, in steps of 1,2,3 and then 4, before repeating the sequence.

17)

Which segment complete the puzzle?



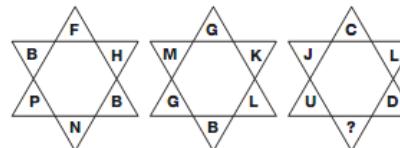
Answer : 2

Explanation :

Splitting the large square into quarters, each quarter features the same pattern of letters.

18)

Which letter replaces the question mark?



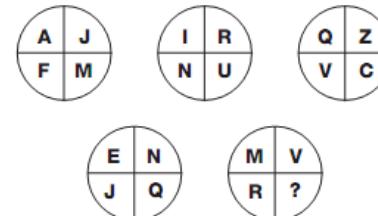
Answer : F

Explanation:

In each star shape, the sum of the numerical values of the letters bounded by one triangle is equal to that of the other triangle.

19)

Which letter replaces the question mark?



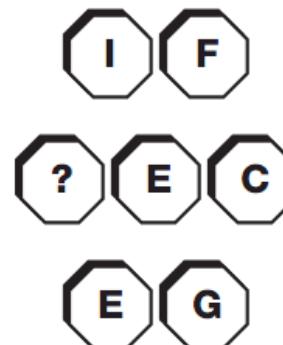
Answer: Y

Explanation:

Starting in the top left circle, and following a W pattern through the others, letters in corresponding segments of the circles follow the alphabetical sequence in steps of 4 letters.

20)

Which letter replaces the question mark?



Answer: A

Explanation:

Writing each letter as its numerical value and working in rows, add the top 2 digit number to the

bottom 2 digit number to give the 3 digit result in the center.

21)

Which letter replaces the question mark?

13	INC	2
6	QRG	7
4	DOM	8
7	SUI	7
8	AD?	2

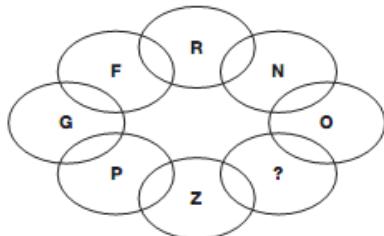
Answer : K

Explanation:

In each row, the product of the left and right hand numbers equals the sum of the numerical values of the three letters.

22)

Which letter replaces the question mark?



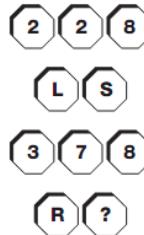
Answer: H

Explanation:

Start at the top and move down, taking single letters or pairs of letters that appear on the same horizontal line. The sum of the numerical values of the letters in each line increases by 2 as you go down, from 18 to 26.

1)

Which letter replaces the question mark?



Answer : U

Explanation : Multiply the numerical values of the letters in each pair to give the 3 digit result in the spaces above.

2)

Which number replaces the question mark?

6	EJI	3
M F K		D P G
9	NRG	?

Answer : 12

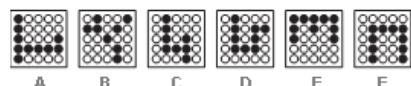
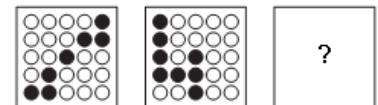
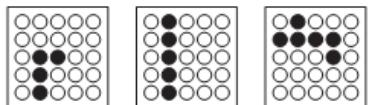
Explanation:

The value at each corner of the diagram equals the difference between the sums of the numerical values of the letters in the boxes adjacent to the corner.

3)

LOGICAL PUZZLES

What is missing in the last grid?

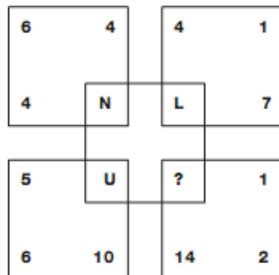


Answer : D

Explanation : The number of black dots in each grid increases by 1 each time, starting with the top left grid and working to the right, top row then bottom row.

4)

Which letter replaces the question mark?

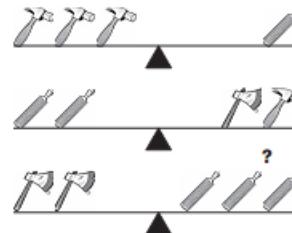


Answer : Q

Explanation : Adding the three numbers in each square together gives the numerical value of the letter at the centre of each square.

5)

Which tool will make the last scale balance?

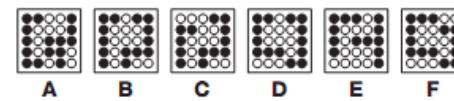
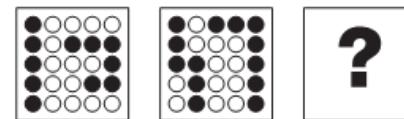
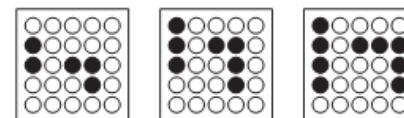


Answer: Hammer

Explanation:

The Hammer = 1, the File = 3 and the Axe = 5
6)

Which grid replaces the question mark?



Answer : A

Explanation:

Working from left to right, top row then bottom row, the first grid contains a sequence of 2 black dots and a sequence of 3. The next grid contains one of 3 and one of 4. Continue, adding 1 to each sequence every time.

7)

Which number replaces the question mark?

6	1
L	P
D	

5	1
J	M
C	

4	4
L	T
H	

3	2
O	U
F	

Answer: 3

Explanation:

In each diagram, the numerical value of the left hand letter equals the product of the upper and lower left hand numbers, and the right hand letter equals the product of the upper and lower right hand numbers. The numerical value of the central letter equals the sum of the numerical values of the left and right hand letters.

8)

Which letter replaces the question mark?

3	P	8
9	G	11
2	U	4
3	W	1
7	?	18

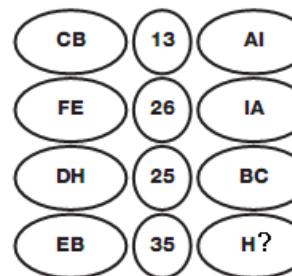
Answer : B

Explanation:

In each row of the diagram, the reverse alphabetical value of the central letter equals the sum of the left and right hand digits.

9)

Which letter replaces the question mark?



Answer : G

Explanation:

Convert each letter to its numerical value, and read each pair of values as 2 digit numbers. In each row, the number in the centre equals the difference between the 2 digit values on the left and right.

10)

Which letter replaces the question mark?

J	O?J	V
L O S		I W L
X	DKS	B

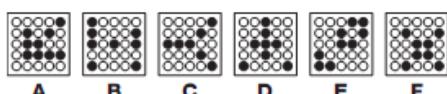
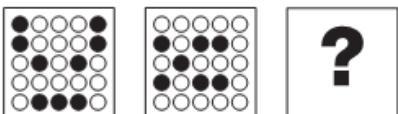
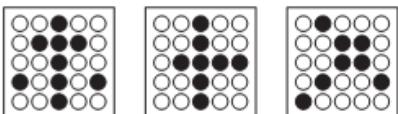
Answer: Y

Explanation:

Start in the top left hand corner and move anti clockwise around the perimeter of the square. Letters are written in alphabetical order, skipping 1 letter, then 2 letters, then 3 etc.

12)

Which grid replace the question mark?

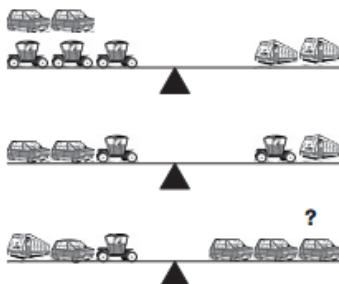


Answer : E

Explanation : In each row, the left hand grid is symmetrical around a vertical axis, the central grid is symmetrical about a horizontal axis, and the right hand grid is symmetrical about a diagonal axis, running bottom left to top right.

13

Which object is needed to make scales balance?



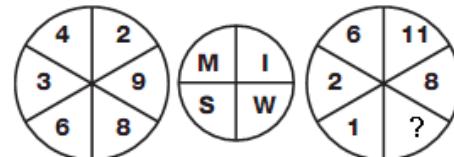
Answer : Carriage

Explanation:

The Carriage = 2, the Car = 3 and the Bus = 6

14)

Which number replaces the question mark?

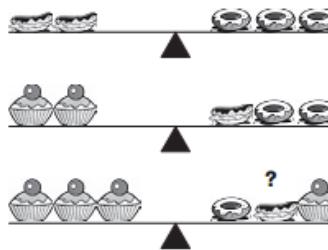


Answer : 4

Explanation : Split the left and right hand circles into 2 halves vertically. The numerical value of the letter in the upper left segment of the central circle equals the sum of the numbers in the left half of the left hand circle, and the letter in the lower left equals the sum of the numbers in the right half of the left hand circle. Repeat this pattern for the right hand circle.

15)

Which symbol is needed to balance the bottom scale?



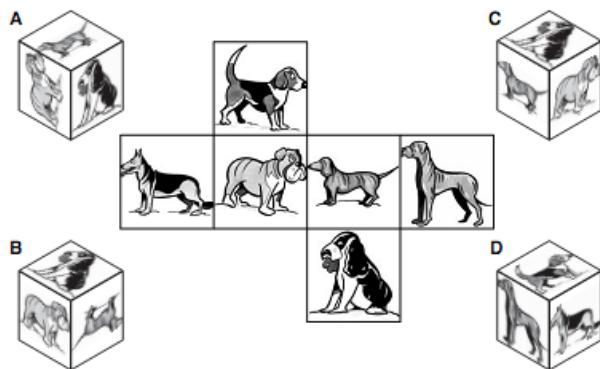
Answer : Doughnut

Explanation :

The Doughnut = 4, the Eclair = 6 and the Bun = 7.

16)

Which picture cube does this shape make?



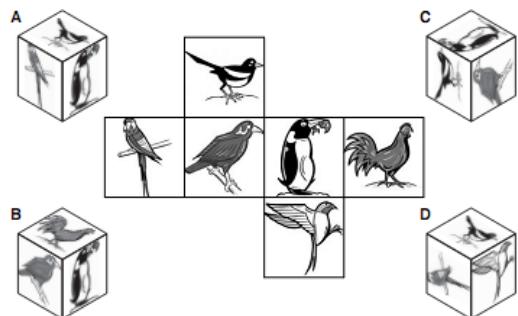
Answer : A

Explanation:

[NIL]

17)

Which picture cube does this shape make?



Answer : C

Explanation : [NIL]

18)

Which letter replaces the question mark?

N	252	R
T	500	Y
Y	400	P
K	132	L
G	182	?

Answer : Z

Explanation : In each row, multiply the numerical values of the left and right hand letters, putting the result in the centre.

19)

Which letter replaces the question mark?

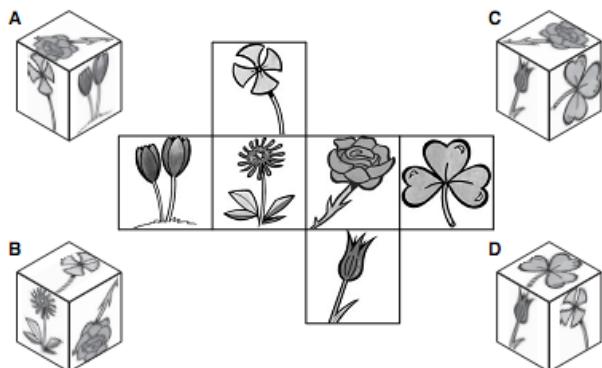
E	B	D	A
9	3	6	9
A	H	B	C
B	E	A	G
9	7	6	1
C	I	C	?

Answer : F

Explanation : In each diagram, convert each letter to its numerical value, and read the top and bottom pairs of letters as complete 2 digit values. Multiply these values together to give the 3 digit result written in the centre spaces.

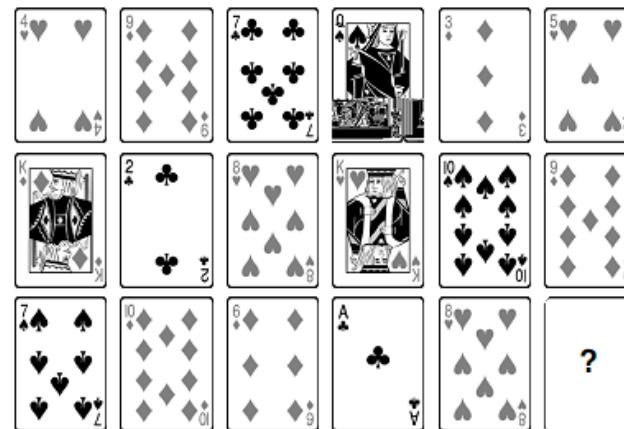
22)

Which picture cube does this shape make?



Answer : C

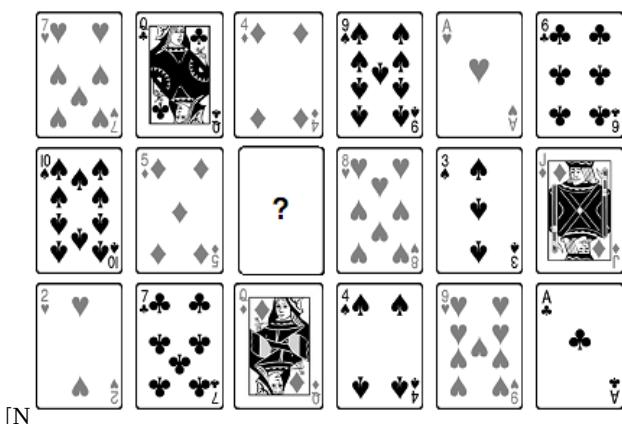
Which playing card replaces the question mark?



Answer : 7 (any suit)

Explanation : Taking the value of Aces as 1 and all court cards as 10, In each column of the diagram, the value of the sum of the 3 cards is always 21.

Which playing card replaces question mark?

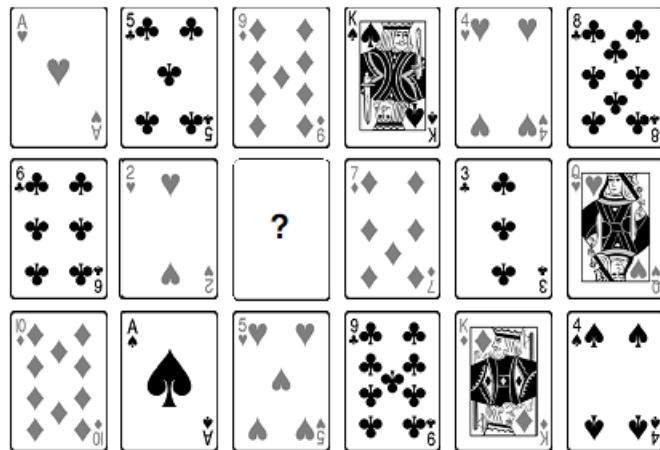


Answer : King of Clubs

Explanation : Start at the top left of the diagram and move to the right, then down one row and to the left etc. in a snakes and ladders pattern. The value of each card increases by 5 each time, with their suit following the sequence of hearts, clubs, diamonds and spades.

3)

Which playing card replaces the question mark?



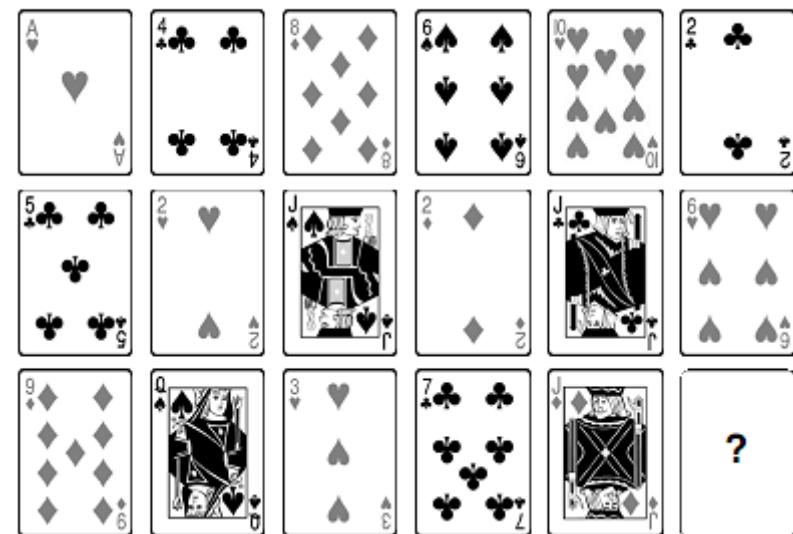
Answer : Jack of Spades

Explanation:

There are 2 sequences in the grid - one determining the value of the card, and one determining the suit of the card. Starting on the top left and moving right, then down one row and to the left, then down the final row and to the right, cards are arranged in order, with their value increasing by 4 each time. To calculate the suit of each card, start on the top left and move down, then right one row and move up etc. cards are arranged in the order Hearts, Clubs, Diamonds, Spades

4).

Which playing card replaces the question mark?



Answer

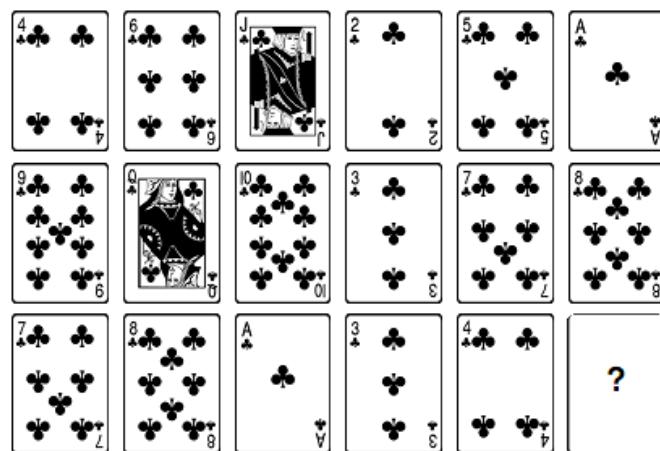
: 3 of Spades

Explanation

: Divide the diagram in half, vertically. In each half, start at the top left and move to the right, then down one row and to the left, and then right, in a snakes and ladders pattern. The value of the cards in each half increase alternately by 3 and 4, and the value of the cards in the other half increase alternately by 4 and 5. To calculate the suit of each card, start at the top left of the whole diagram and move down, then right one space and upwards etc. in a snakes and ladders pattern. Suit is in order, following this path, starting with Hearts, then Clubs,] and Spades.

5)

Which playing card replaces the question mark?



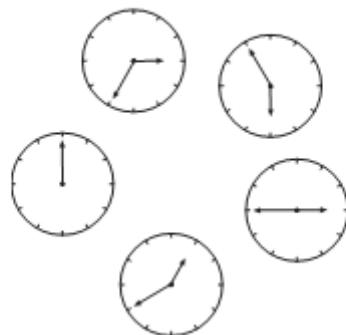
Answer : Nine of Clubs

Explanation : In each column of the diagram, add the top and bottom card value and subtract 2 to give the value of the central card.

CLOCK PUZZLES

1)

Where should the missing hour hand point?



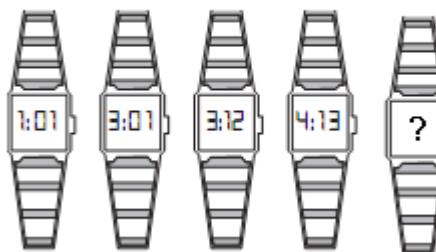
Answer : To the 4

Explanation

: Start with the top left clockface, and move around the others in a clockwise direction. The value pointed to by the hour hand equals the value pointed to by the minute hand, subtracting 4 for the first clockface, 5 for the next, then 6 etc.

2)

Which time should the last watch show?

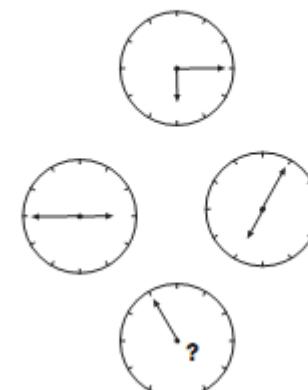


Answer : 5:23

Explanation : The sum of the separate digits on each watch increases by 2 as you right.

3)

Where should the hour hand be pointing on the bottom clock?

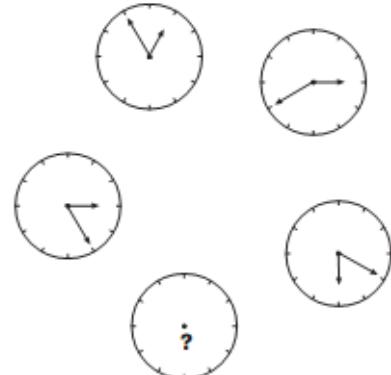


Answer : Hour hand is pointing to 2.

Explanation : Multiply the hour hand value by 2 and add the minute hand value. This total is always 15.

4)

What time should the bottom clock show?



Answer : Five minutes to Ten

Explanation : Start with the top left clockface, and move around the others clockwise. The minute hand moves backwards by 15 minutes, then 20, then 25 etc. The hour hand moves forward 2 hours, then 3, then 4 etc.

5)

What time should the last watch show?



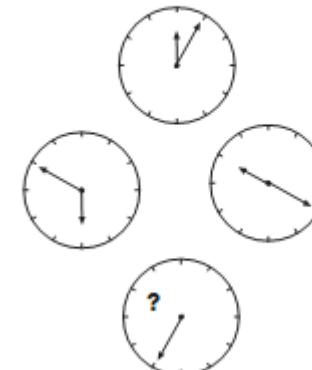
Answer : 5:23

Explanation:

The sum of the separate digits on each watch increases by 2 as you move to the right.

6)

Where should the hour hand point to on the bottom clock?

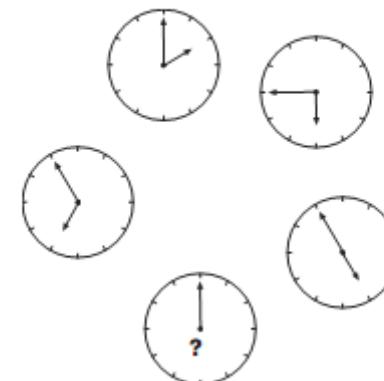


Answer : Hour hand points to 8

Explanation : Starting with the top clockface, and moving clockwise around the circle, the minute hand moves forward 15 minutes, while the hour hand moves forward 1 hour each time.

7)

Where should missing hour hand point?

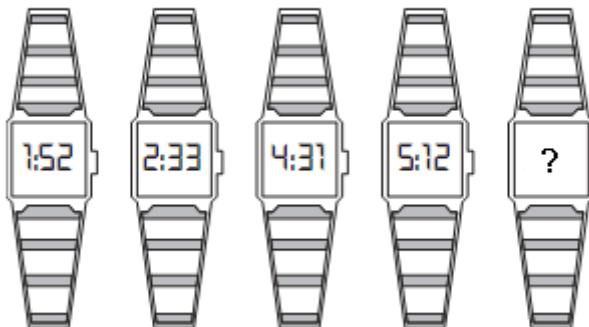


Answer : To the 5

Explanation : Start with the top left clockface, and move around the others in a clockwise direction. The sum of the numbers pointed to by the hour and minute hands is a sequence 14, 15, 16, 17 and 18.

8)

What time should the last watch show?

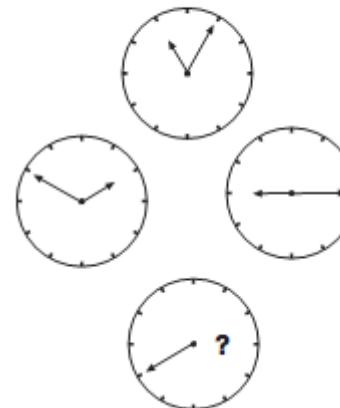


Answer : 6:20

Explanation : On each watch, the sum of the digits shown equals 8.

9)

Where should the hour hand point to on the bottom clock?

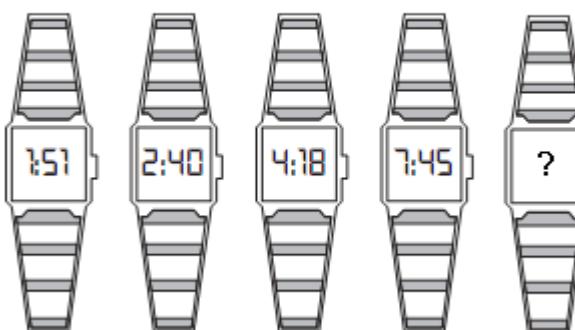


Answer : The hour hand points to the 4.

Explanation : The sum of the values pointed to by the hands on each clock equals 8.

10)

What time should last watch show?



Answer : 11:01

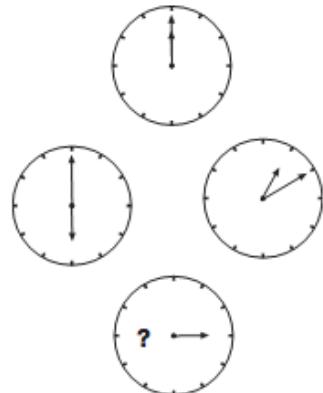
Explanation : Taking the hour and minute values on each watch separately, as you go from left to right the hour value increases by 1, 2, 3 and 4, and the minute value decreases by 11, 22, 33 and 44.

Answer : Minute hand pointing to 6

Explanation : Starting with the top clockface and moving clockwise around the others, the hour hand moves forward by 1 hour, then 2, then 3, while the minute hand moves forward 10 minutes, then 20, then 30.

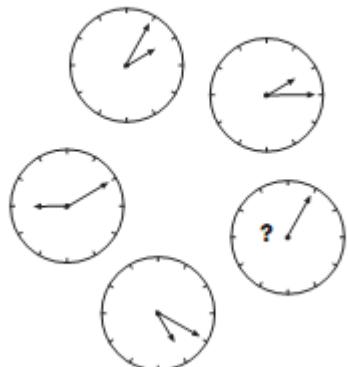
11)

What should the minute hand point to on the bottom clock?



12)

Where should the missing hour hand point to?



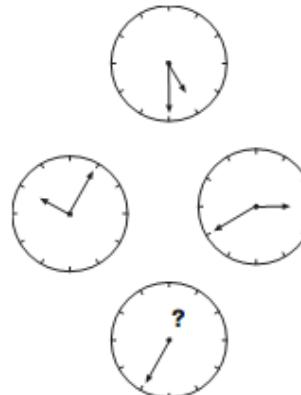
Answer : To the 6

Explanation : Starting with the top left clockface and working clockwise around the others, the sum of the numbers pointed to by

the 2 hands starts at 3 and increases by 2 each time.

13)

Where should the missing hour hand point to on the bottom clock?



Answer : To the 4

Explanation : The sum of the numbers pointed to by the hour and minute hands is always 11.

14)

What time should the last watch show?



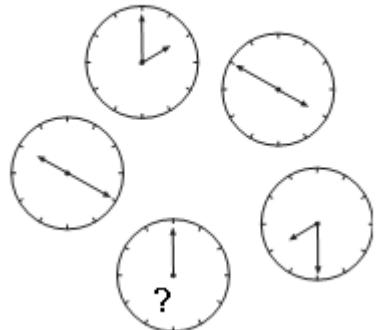
Answer : 6:06

Explanation : Start with the watch on the left and move to the right. The

time on the watches increases by 2 hours 3 minutes, then decreases by 1 hour 16 minutes, alternately.

15)

What time should the missing hand point to on the bottom clock?

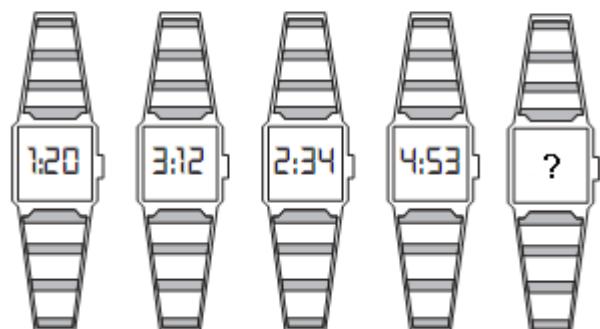


Answer : To the 2

Explanation : Starting with the top left clockface and moving clockwise around the others, the minute hand moves back 2 places, then 4, 6 and 8, while the hour hand moves forward 2 places, then 4, 6 and 8.

16)

What time should the last watch show?

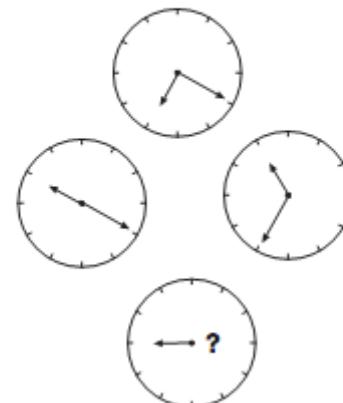


Answer : 6:45

Explanation : As you move from left to right, add 1 to the value of each digit on the watch, and rotate the digits one place to the left.

17)

Where should the minute hand point on to the bottom clock?

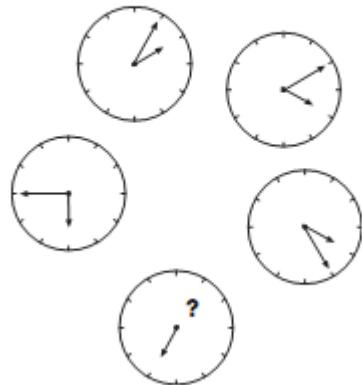


Answer : To the 4

Explanation : Starting with the top clockface and moving clockwise around the others, the minute hand points to the value 3 less than that pointed to by the hour hand. Repeat for the other clockfaces, subtracting 4, 5 and 6 from the hour hand values.

18)

Where should the minute hand point to on the bottom clock?



Answer : To the 5

Explanation : Start with the top left clockface and move clockwise around the others. The sum of the numbers pointed to by the hour and minute hand follows the sequence 3, 6, 9, 12 and 15.

19)

What time should the last watch show?

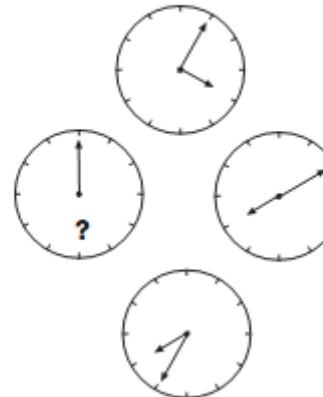


Answer : 3:36

Explanation : On each watch, the time shown contains two digits that are the same.

20)

Where should the missing hand point to?



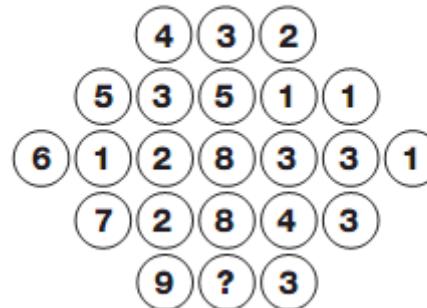
Answer : To the 8

Explanation : Start with the top clockface and move clockwise around the others. The sum of the numbers pointed to by the 2 hands follows the sequence 5, 10, 15, 20.

NUMBER PUZZLES

1)

What number comes inside the circle?

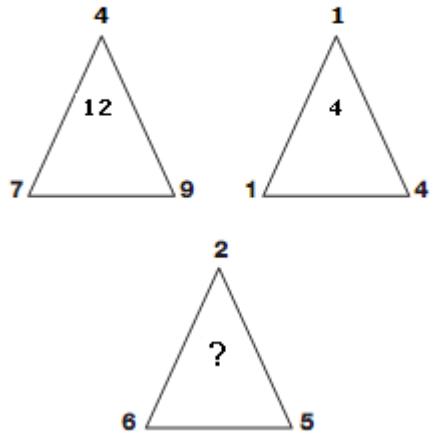


Answer : 6

Explanation : Looking at the diagram in rows, the central circle equals

half the sum of the numbers in the other circles to the left and right of the centre.

Which number replaces the question mark?

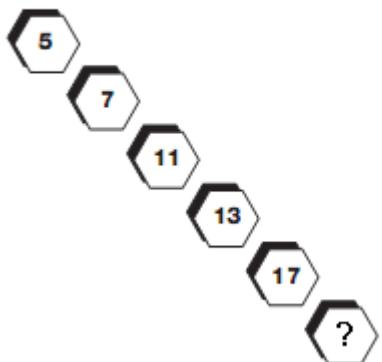


Answer : 9

Explanation : The number at the centre of each triangle equals the sum of the lower two numbers minus the top number.

3)

Which number completes the puzzle?

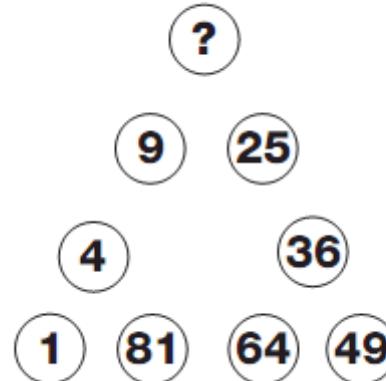


Answer : 19

Explanation : As you move diagonally down, numbers follow the sequence of Prime Numbers.

4)

Which number replaces the question mark?



Answer : 16

Explanation : Starting bottom left and moving clockwise around the triangle, numbers follow the sequence of Square Numbers.

5)

Which number replaces the question mark?

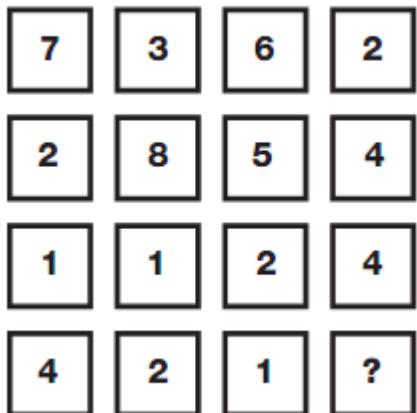


Answer : 39

Explanation : Working from top to bottom, double each number and subtract 1, then 2, then 3 etc.

6)

Which number replaces the question mark?

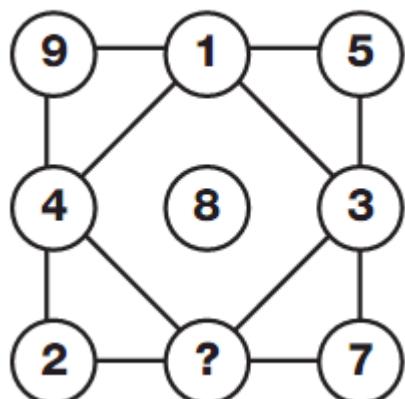


Answer : 4

Explanation : Working in columns, the sum of the numbers in each column is always 14.

7)

Which letter replaces the question mark?



Answer : 6

Explanation : The numbers in each row and column add up to 15.

8)

What is missing from the hexagon?

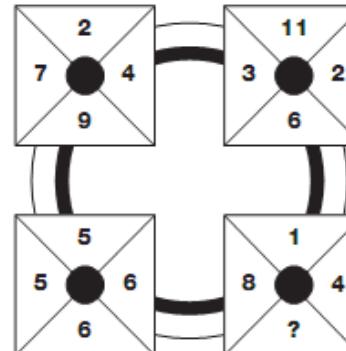


Answer : 40

Explanation : Moving from left to right, numbers increase by 2,3,4 and 5.

9)

Which number replaces the question mark?

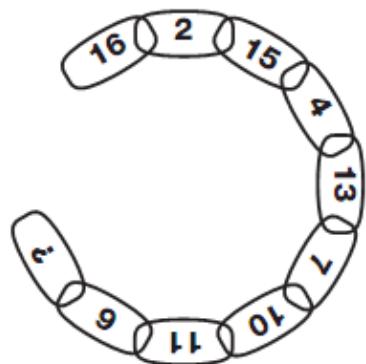


Answer : 9

Explanation : In each square of the diagram, the sum of the numbers is always 22.

10)

Which number replaces the question mark?



Answer : 16

Explanation : Moving clockwise, around alternate segments in the chain, one sequence decreases by 1, 2, 3 and 4 each time, while the other increases by 2, 3, 4 and 5.

11)

Which number replaces the question mark?

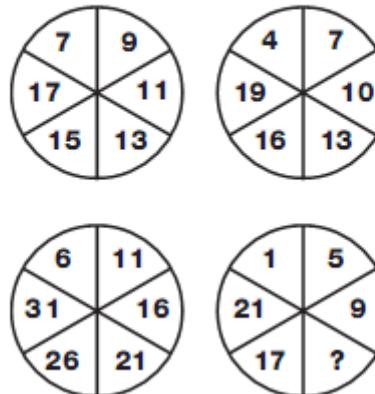


Answer : 7

Explanation : Starting with the numbers in the top row, and following straight lines through the centre of the diagram, subtract the middle number from the top number to give the corresponding value on the bottom row.

12)

Which number replaces the question mark?

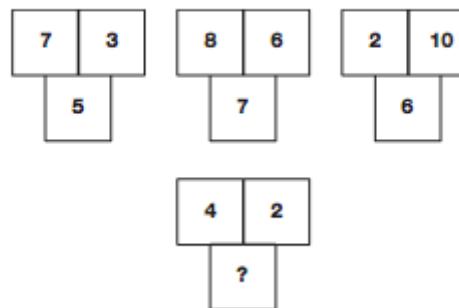


Answer : 13

Explanation : In each circle, starting at the top left segment, numbers increase, as you move clockwise, by 2 for the upper left circle, 3 for the upper right, 4 for the lower right and 5 for the lower left.

13)

Which number replaces the question mark?

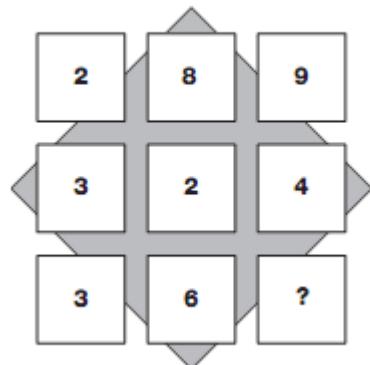


Answer : 3

Explanation : In each group of 3 numbers, the lower number equals the average of the top two numbers.

14)

Which number replaces the question mark?



Answer : 1

Explanation : Reading each row as a 3 digit number, the rows follow the sequence of square numbers, from 17 to 19.

15)

Which number replaces the question mark?

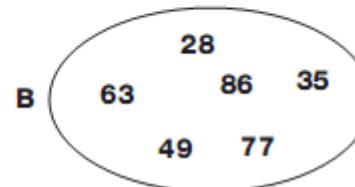
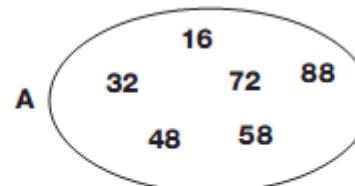


Answer : 8,1

Explanation : Reading each row as 3 separate 2-digit numbers, the central number equals the average of the left and right hand numbers.

16)

Which number is the odd one out in each oval?

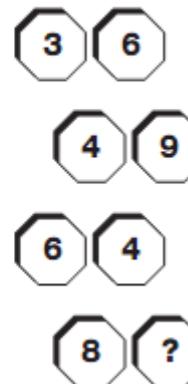


Answer : A:58 B:86

Explanation : In the first oval, all numbers are multiples of 8, and in the second, they are all multiples of 7.

17)

Which number replaces the question mark?

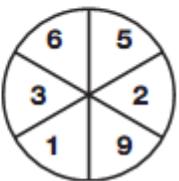
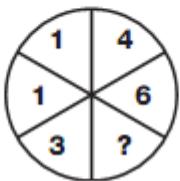
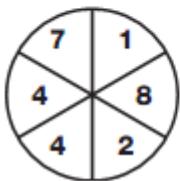
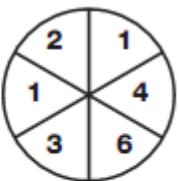
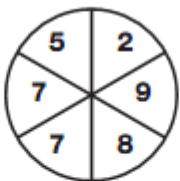
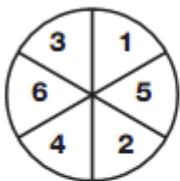


Answer : 1

Explanation : Reading each pair of numbers as a 2 digit number, they follow the sequence of square numbers from 6 to 9.

18)

Which number replaces the question mark?

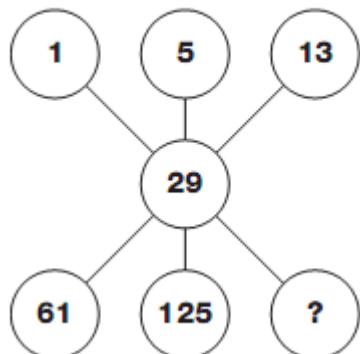


Answer : 7

Explanation : Taking the top row of circles, numbers in the central circle equal the sum of the numbers in corresponding segments of the left and right hand circles. In the bottom row, numbers in the central circle equal the difference between numbers in corresponding segments of the left and right hand circles.

19)

Which number replaces the question mark?



Answer : 253

Explanation : Starting at the top left, and moving through the diagram in a Z shape, double each number and add 3 to give the next

number along.

20)

Which number replaces the question mark?



Answer : 51

Explanation : Moving to the right, double each number and subtract 3 to give the next number along.

21)

Which number replaces the question mark?

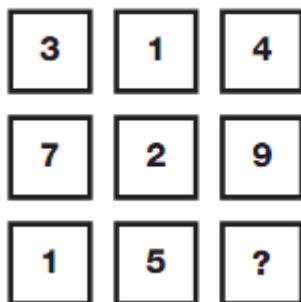


Answer : 2

Explanation : Starting with the 10 at the top, one set of numbers increases by 3 each time, written in alternate boxes as you move down the diagram, and the other set of numbers decreases by 2, written in the boxes remaining.

22)

Which number replaces the question mark?

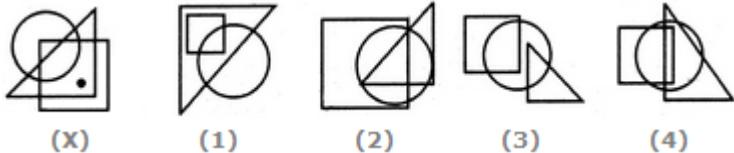


Answer : 6

Explanation : On each row, add the values of the left hand and central boxes to give the value in the right hand box.

DOT SITUATION

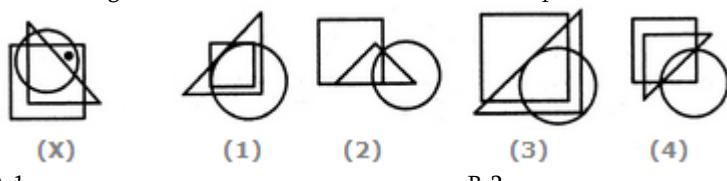
1) Select the figure which satisfies the same conditions of placement of the dots as in Figure-X.



- A.1
C.3
Answer: Option A
Explanation:

In fig. (X), the dot is contained in the region common to the triangle and the square only. Out of the four alternatives, only fig. (1) contains a region common to the triangle and the square only.

2. Select the figure which satisfies the same conditions of placement of the dots as in Figure-X.

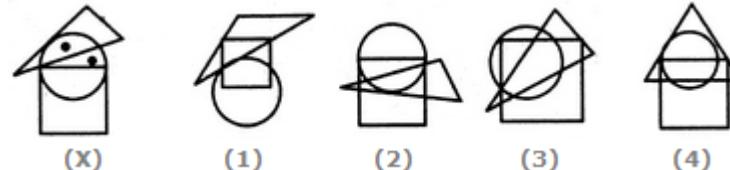


- A.1
C.3
Answer: Option D
Explanation:

In fig. (X), the dot is contained in the region common to the square and the circle only. Out of

the four alternatives, only fig. (4) contains a region common to the square and the circle only.

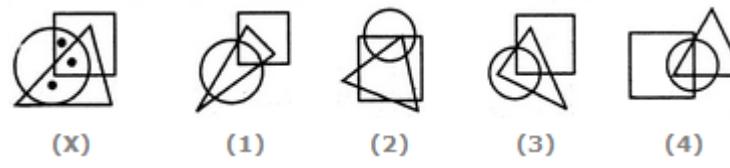
3. Select the figure which satisfies the same conditions of placement of the dots as in Figure-X.



- A.1
C.3
Answer: Option C
Explanation:

In fig. (X), one of the dots lies in the region common to the circle and the triangle only and the other dot lies in the circle alone. In each of the two figures (1) and (2), there is no region common to the circle and the triangle only. In fig. (4) there is no region which lies in the circle alone. Only fig. (3) consists of both the types of regions.

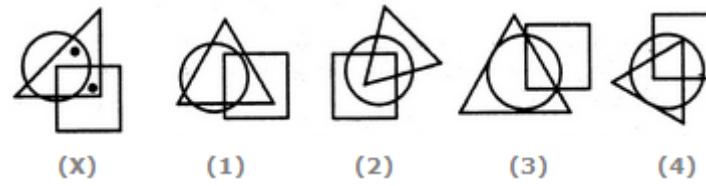
4. Select the figure which satisfies the same conditions of placement of the dots as in Figure-X.



- A.1
C.3
Answer: Option D
Explanation:

In fig. (X), one of the dots lies in the region common to the circle and the triangle only, another dot lies in the region common to all the three figures - the circle, the square and the triangle and the third dot lies in the region common to the circle and the square only. In each of the figures (1) and (3), there is no region common to the circle and the square only and in fig. (2), there is no region common to the circle and the triangle only. Only fig. (4) consists of all the three types of regions.

5. Select the figure which satisfies the same conditions of placement of the dots as in Figure-X.



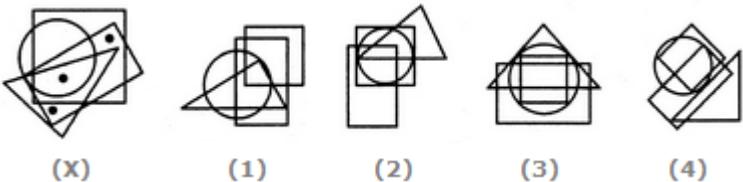
- A.1
Answer: Option B
Explanation:

Answer: Option A

Explanation:

In fig. (X), one of the dots is placed in the region common to the circle and the triangle only and another dot is placed in the region common to the square and the triangle only. In each of the three alternatives (2), (3) and (4), there is no region common to the square and the triangle only. Only fig. (1) consists of both the types of regions.

6. Select the figure which satisfies the same conditions of placement of the dots as in Figure-X.



A.1

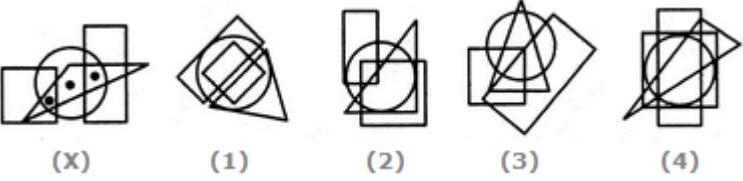
C.3

Answer: Option A

Explanation:

In fig. (X), one of the dots lies in the region common to the square and the rectangle only, another dot lies in the region common to all the four elements - the circle, the square, the triangle and the rectangle and the third dot lies in the region common to the triangle and the rectangle only. In fig. (2) there is no region common to the triangle and the rectangle only. In fig. (3) there is no region common to the square and the rectangle only. In fig. (4) there is no region common to all the four elements - the circle, the square, the triangle and the rectangle. Only fig. (1) consists of all the three types of regions.

7. Select the figure which satisfies the same conditions of placement of the dots as in Figure-X.



A.1

C.3

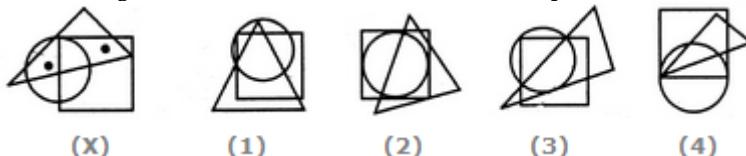
Answer: Option C

Explanation:

In fig. (X), one of the dots lies in the region common to the circle the triangle and the rectangle only, another dot lies in the region common to the circle and the triangle only and the third dot lies in the region common to the circle, the square and the triangle only. In each of the figures (1), (2) and (4) there is no region common to the circle, the triangle and the

rectangle only. Only fig. (3) consists of all the three types of regions.

8. Select the figure which satisfies the same conditions of placement of the dots as in Figure-X.



A.1

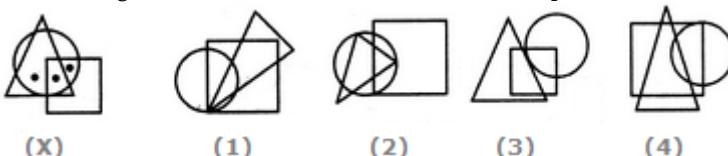
C.3

Answer: Option A

Explanation:

In fig. (X), one of the dots lies in the region common to the circle and the triangle only and the other dot lies in the region common to the square and the triangle only. In each of the figures (2), (3) and (4), there is no region common to the circle and the triangle only. Only fig. (1) consists of both the types of regions.

9. Select the figure which satisfies the same conditions of placement of the dots as in Figure-X.



A.1

C.3

Answer: Option B

Explanation:

In fig. (X), one of the dots lies in the region common to the circle and the square only, another dot lies in the region common to all the three figures - the circle, the square and the triangle and the third dot lies in the region common to the circle and the triangle only. In each of the alternatives (1), (3) and (4), there is no region common to the circle and the triangle only. Only fig. (2) consists of all the three types of regions.

10. Select the figure which satisfies the same conditions of placement of the dots as in Figure-X.



A.1

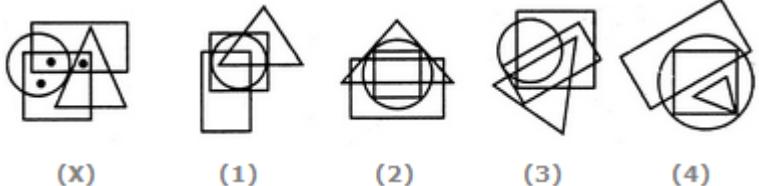
C.3

Answer: Option D

Explanation:

In fig. (X), one of the dots lies in the region common to the square and the triangle only and the other dot lies in the region common to all the three figures - the circle, the square and the triangle. In each of the alternatives (1) and (2), there is no region common to the square and the triangle only. In alternative (3), there is no region common to all the three figures. Only, alternative (4) consists of both the types of regions

11. Select the figure which satisfies the same conditions of placement of the dots as in Figure-X.



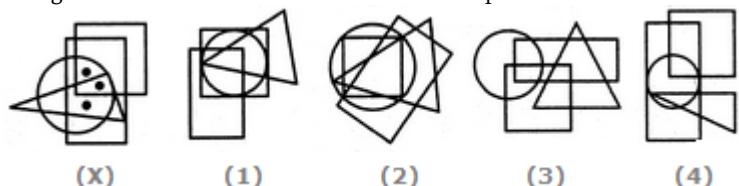
- A.1
C.3
B.2
D.4

Answer: Option C

Explanation:

In fig. (X), one of the dots lies in the region common to the circle and the square only, another dot lies in the region common to the circle, the square and the rectangle only. Dot and the third dot lies in the region common to the square, the triangle and the rectangle only. In each of the figures (1), (2) and (4), there is no region common to the square, the triangle and the rectangle only. Only fig. (3) consists of all the three types of regions.

12. Select the figure which satisfies the same conditions of placement of the dots as in Figure-X.



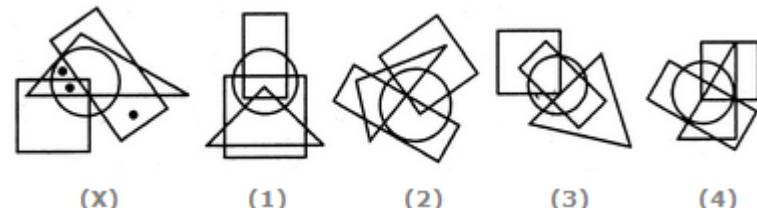
- A.1
C.3
B.2
D.4

Answer: Option B

Explanation:

In fig. (X), one of the dots lies in the region common to the circle, the square and the rectangle only, another dot lies in the region common to all the four elements - the circle, the square, the triangle and the rectangle and the third dot lies in the region common to the circle, the triangle and the rectangle only. In fig. (1), there is no region common to the circle, the triangle and the rectangle only. In each of the figures (3) and (4) there is no region common to all the four elements - the circle, the square, the triangle and the rectangle. Only fig. (2) consists of all the three types of regions.

13. Select the figure which satisfies the same conditions of placement of the dots as in Figure-X.



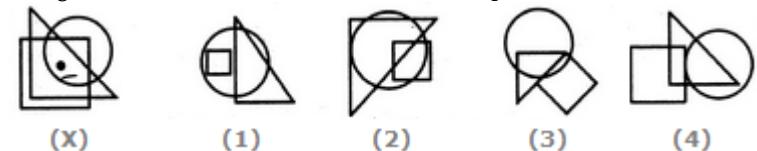
- A.1
C.3
B.2
D.4

Answer: Option B

Explanation:

In fig. (X), one of the dots lies in the region common to the circle and the triangle only, another dot lies in the region common to the circle, the square and the triangle only and the third dot lies in the rectangle alone. In figures (1) and (4) there is no region common to the circle and the triangle only. In fig. (3) there is no region which lies in the rectangle alone. Only fig. (2) contains all the three types of regions.

14. Select the figure which satisfies the same conditions of placement of the dots as in Figure-X.



- A.1
C.3
B.2
D.4

Answer: Option B

Explanation:

In fig. (X), the dot lies in the region common to all the three figures - square, triangle and circle. Out of the four alternatives, only fig. (2) contains a region common to all the three figures. Hence, fig. (2) is the answer.

15. Select the figure which satisfies the same conditions of placement of the dots as in Figure-X.



- A.1
C.3
B.2
D.4

Answer: Option C

Explanation:

In fig. (X), one of the dots lies in the triangle alone, another dot lies in the region common to the square and the triangle only and the third dot lies in the region common to the circle and the square only. In each of the figures (1), (2) and (4), there is no region common to the square and the triangle only. Only fig. (3) consists of all the three types of regions.

16. Select the figure which satisfies the same conditions of placement of the dots as in Figure-X.



Answer: Option A

Explanation:

In fig. (X), one of the dots lies in the region common to the circle and the square only, another dot lies in the region common to all the three figures - the circle, the square and the triangle and the third dot lies in the circle alone. In fig. (2) there is no region common to the circle and the square only and in each of the figures (3) and (4) there are regions which lie in the circle alone. Only fig. (1) consists of all the three types of regions.

17. Select the figure which satisfies the same conditions of placement of the dots as in Figure-X.

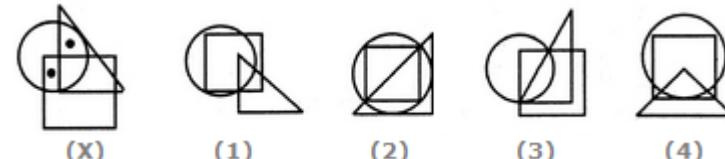


Answer: Option D

Explanation:

In fig. (X), one of the dots lies in the region common to the circle and the rectangle only and the other dot lies in the region common to the circle, the square and the triangle only. In each of the figures (1) and (2), there is no region common to the circle and the rectangle only. In fig. (3), there is no region common to the circle, the square and the triangle only. Only fig. (4) consists of both the types of regions.

18. Select the figure which satisfies the same conditions of placement of the dots as in Figure-X.



- ## A.1 B.2

- C.3 D.4

Answer: Option B

Explanation:

In fig. (X), one of the dots lies in the region common to the circle and the triangle only and the other dot lies in the region common to the circle and the square only. In each of the figures (1), (3) and (4), there is no region common to the circle and the triangle only. Only fig. (2) consists of both the types of regions.

19. Select the figure which satisfies the same conditions of placement of the dots as in Figure-X.



- A 1

- C.3 D.4

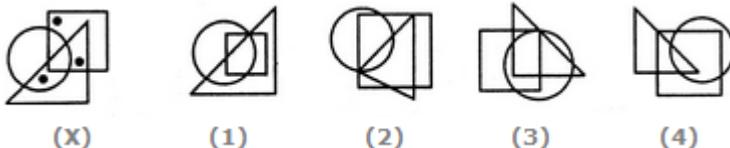
Answer: Option A

1

In fig. (X), one of the dots lies in the square alone, another dot lies in the triangle alone and the third dot lies in the region common to the circle and the square. In fig. (2) there is no region that lies in the square alone, in fig. (3) there is no region that lies in the triangle alone and in fig. (4) there is no region that lies in the region common to the circle and the square

only. Only fig. (1) consists of all the three types of regions.

20. Select the figure which satisfies the same conditions of placement of the dots as in Figure-X.



- A.1
 - C.3
 - B.2
 - D.4

Answer: Option C

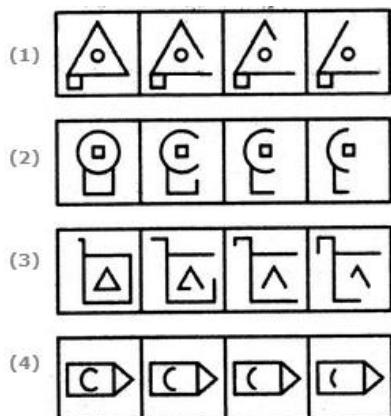
Explanation:

In fig. (X), one of the dots lies in the square alone, another dot lies in the region common to the square and the triangle only and the third dot lies in the region common to the circle and the triangle. In fig. (1), there is no region which lies in the square alone. In each of the figures (2) and (4), there is no region common to the circle and the triangle only. Only, fig. (3) consists of all the three types of regions.

RULE DETECTION

1. Choose the set of figures which follows the given rule.

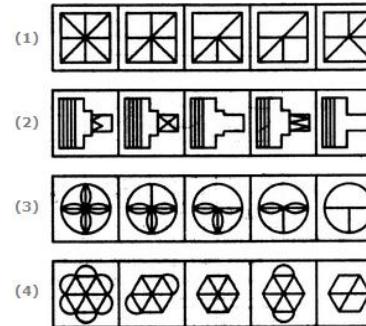
Rule: Closed figures become more and more open and open figures become more and more closed.



Answer: Option C

2. Choose the set of figures which follows the given rule.

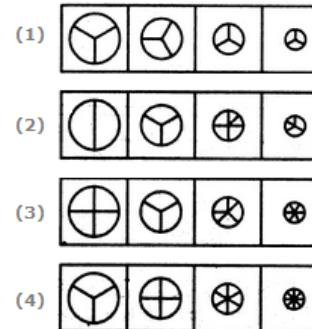
Rule: The series becomes simpler as it proceeds.



Answer: Option C

3. Choose the set of figures which follows the given rule.

Rule: As the circle decreases in size, its sectors increase in number.

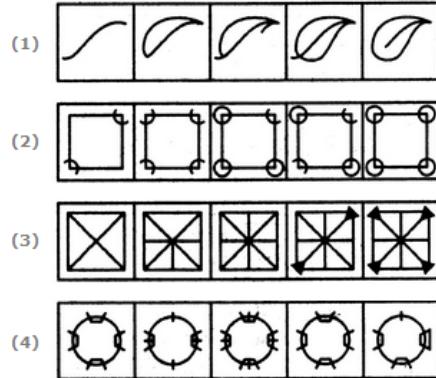


- | | |
|-----|-----|
| A.1 | B.2 |
| C.3 | D.4 |

Answer: Option D

4. Choose the set of figures which follows the given rule.

Rule: The series becomes complex as it proceeds.



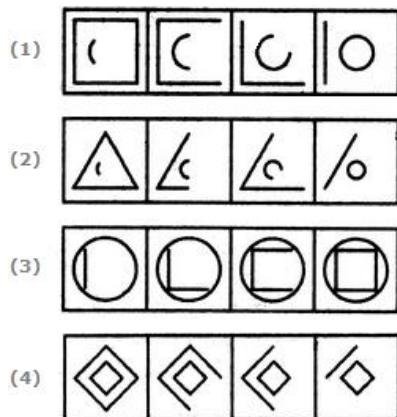
A.1
C.3

Answer: Option C

B.2
D.4

5. Choose the set of figures which follows the given rule.

Rule: Closed figures become more and more open and open figures become more and more closed.



A.1
C.3

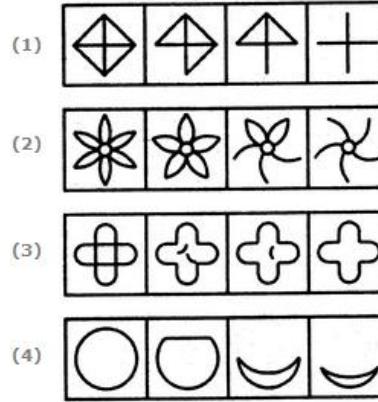
Answer: Option A

B.2
D.4

6.

Choose the set of figures which follows the given rule.

Rule: Closed figure becomes more and more open.



A.1
C.3

Answer: Option A

B.2
D.4

VERBAL APTITUDE CLOSET TEST

1. Today most businessmen are very worried. To begin with, they are not used to competition. In the past they sold whatever ... (1) ... produced at whatever prices they chose. But ... (2) ... increasing competition, customers began to ... (3) ... and choose. Imports suddenly became ... (4) ... available and that too at cheaper ... (5) ...

- | | |
|---------|------|
| 1. A.It | B.he |
| C.They | D.we |

Answer: Option C

- | | |
|---------|--------|
| 2. | |
| A.With | B.by |
| C.After | D.from |

Answer: Option A

- | | |
|--------|--------|
| 3. | |
| A.Buy | B.Take |
| C.Pick | D.Want |

Answer: Option C

- | | |
|--------------|----------------|
| 4. | |
| A.hardly | B.Easily |
| C.frequently | D.Conveniently |

Answer: Option B

- | | |
|------------|-----------|
| 5. | |
| A.costs | B.returns |
| C.dividend | D.prices |

- | | | | | |
|-----|--|-----------------------------|--|----------------------------|
| 8. | A.winter
C.spring | B.Summer
D.Autumn | A.study
C.dismiss
E.remove | B.prevent
D.spread |
| 9. | A.seeds
C.fruit | B.crops
D.food | Answer: Option B | |
| 10. | A.while
C.after | B.until
D.when | 7.
A.treatment
C.cause
E.operation | B.patient
D.discovery |
| | | | Answer: Option D | |
| | | | 8.
A.were
C.have
E.would be | B.may be
D.are |
| 5. | ...(1)... can be injected ... (2)... human blood for ... (3)... diphtheria, pneumonia and severe wounds ... (4)... surgical operations, penicillin is given to ... (5)... to ... (6)... the bacterial information from spreading. After this ... (7)... several antibiotics ... (8)... discovered. Today, these antibiotics are ... (9)... the lives of lakhs of ... (10)... all over the world. | | | |
| 1. | A.Antibiotics
C.Streptomycin
E.Medicine | B.Penicillin
D.Teramycin | Answer: Option A | |
| 2. | A.within
C.on
E.over | B.through
D.into | 9.
A.multiplying
C.saving
E.growing | B.providing
D.infecting |
| | | | Answer: Option C | |
| 3. | A.treating
C.discovering
E.monitoring | B.operating
D.spreading | 10.
A.children
C.women
E.people | B.species
D.medicos |
| | | | Answer: Option E | |
| 4. | A.In
C.While
E.During | B.Over
D.After | 6. Desire and action are often coordinated in that desire may ... (1)... the person to action or that desire may be ... (2)... from action. If P is seen as trying to do X, it is often inferred that P desires X. However, desire and action are not ... (3)... coordinated. The person may desire X without ... (4)... in any action directed towards the attainment of X. This even happens when X appears ... (5)... or when the other effects resulting from the action ... (6)... to attain X are sufficiently undesirable as to ... (7)... the desire for X. Sometimes, Of course, no action is necessary; the desire may or may not be ... (8)... quite independently of P's action. Furthermore, a given desire may lead to different actions, depending upon the environmental requirements. Actions are ... (9)... not only by desire but also by the way the person ... (10)... the casual structure of the environment. | |
| | | | 1.
A.dampen
C.indulge
E.prohibit | B.hinder
D.arouse |
| 5. | A.children
C.patients
E.nurses | B.Injured
D.Doctors | Answer: Option D | |
| | | | 2.
A.expelled
C.abstained | B.caused
D.refrained |
| | | | | |
| | | | | |

E.inferred

Answer: Option E

3.

A.invariably

C.deliberately

E.negatively

Answer: Option A

4.

A.wanting

C.engaging

E.exhibiting

Answer: Option C

5.

A.manageable

C.unattainable

E.approachable

Answer: Option E

6.

A.hostile

C.incidental

E.detrimental

Answer: Option B

7.

A.express

C.reciprocate

E.negate

Answer: Option E

8.

A.realised

C.verbalised

E.actualised

Answer: Option A

9.

A.projected

C.controlled

E.pronounced

Answer: Option B

10.

A.downgrades

C.develops

E.enlarges

Answer: Option C

B.hopefully

D.purposely

B.associating

D.supporting

B.valuable

D.reachable

B.necessary

D.insensible

B.appreciate

D.damage

B.hypothesised

D.criticised

B.determined

D.Galvanized

B.fabricates

D.sees

IDIOMS AND PHRASES

Some proverbs/idioms are given below together with their meanings. Choose the correct meaning of proverb/idiom, If there is no correct meaning given, E (i.e.) 'None of these' will be the answer.

1.To cry wolf

A.To listen eagerly

B.To give false alarm

C.To turn pale

D.To keep off starvation

E.None of these

Answer: Option B

2.To end in smoke

A.To make completely understand

B.To ruin oneself

C.To excite great applause

D.To overcome someone

E.None of these

Answer: Option B

3.To be above board

A.To have a good height

B.To be honest in any business deal

C.They have no debts

D.To try to be beautiful

E.None of these

Answer: Option B

4.To put one's hand to plough

A.To take up agricultural farming

B.To take a difficult task

C.To get entangled into unnecessary things

D.Take interest in technical work

E.None of these

Answer: Option B

5.To do oneself justice

A.To dispense justice on our own

B.To treat others with due respect

C.To defend one's point of view

D.To follow the path of truth and justice

E.None of these

Answer: Option E

6.To pick holes

A.To find some reason to quarrel

B.To destroy something

C.To criticise someone

D.To cut some part of an item

E. None of these

Answer: Option C

7. To leave someone in the lurch

A. To come to compromise with someone

B. Constant source of annoyance to someone

C. To put someone at ease

D. To desert someone in his difficulties

E. None of these

Answer: Option D

8. To play second fiddle

A. To be happy, cheerful and healthy

B. To reduce importance of one's senior

C. To support the role and view of another person

D. To do back seat driving

E. None of these

Answer: Option C

9. To be the question

A. To refer to

B. To take for granted

C. To raise objections

D. To be discussed

E. None of these

Answer: Option B

10. A black sheep

A. An unlucky person

B. A negro

C. An ugly person

D. A partner who takes no share of the profits

E. None of these

Answer: Option E

Explanation: In the English language, 'Black sheep' is an idiom used to describe an odd or disreputable member of a group, especially within a family.

11. A man of straw

A. A man of no substance

B. A very active person

C. A worthy fellow

D. An unreasonable person

E. None of these

Answer: Option A

12. To smell a rat

A. To see signs of plague epidemic

B. To get bad smell of a bad dead rat

C. To suspect foul dealings

D. To be in a bad mood

E. None of these

Answer: Option C

13. To hit the nail right on the head

A. To do the right thing

B. To destroy one's reputation

C. To announce one's fixed views

D. To teach someone a lesson

E. None of these

Answer: Option A

Explanation: To do exactly the right thing; to do something in the most effective and efficient way.

14. To join issue with

a. To cooperate with others for a cause

b. To join any voluntary organization for good purpose

c. To resolve dispute and restore peace

d. To enter in to argument over any issues

e. None of the above

Answer: Option C

Explanation: To Cooperate.

15. To set one's face against

A. To oppose with determination

B. To judge by appearance

C. To get out of difficulty

D. To look at one steadily

E. None of these

Answer: Option A

EXERCISE - II

In the following questions four alternatives are given for the idiom/phrase *italicised and underlined* in the sentence. Choose the alternative which best expresses the meaning of idiom/phrase.

1. Their business is now *on its last legs*.

A. About to fructify

B. About to perish

C. About to produce results

D. About to take off

Answer: Option B

2. There was no opposition to the new policy by the *rank and file* of the Government.

A. the official machinery

B. the ordinary members

C. the majority

D. the cabinet ministers

Answer: Option B

3. He *went back on* his promise to vote for me.

A. withdrew

B. forgot

C. reinforced

D. supported

Answer: Option A

4. The old beggar *ran amuck* and began to throw stones at the passerby.

A. became desperate

B. ran about wildly

C. became annoyed

D. felt disgusted

Answer: Option B

5. I cannot *conceive* of a time when I was without a refrigerator

- A. Imagine
- B. Give birth
- C. Understand
- D. Depend

Answer: Option A

6.In spite of the immense pressure exerted by the militants, the Government has decided not to *give in*.

- A.accede
- B.yield
- C.oblige
- D.confirm

Answer: Option B

7.The authorities *took him to task* for his negligence.

- A.gave him additional work
- B.suspended his assignment
- C.reprimanded him
- D.forced him to resign

Answer: Option C

8.The detective *left no stone unturned* to trace the culprit.

took no pains
did very irrelevant things
resorted to illegitimate practices
used all available means

Answer: Option D

9.Rohit has *bitten off more than he chew*.

- A.Is trying to do much
- B.Is very greedy
- C.Is always hungry
- D.Has little regard for others

Answer: Option A

10.His speech *went down well with* the majority of the audience.

- A.found acceptance with
- B.was attentively listened to by
- C.was appreciated by
- D.was applauded by

Answer: Option C

11.The parliamentary inquiry into the Bofors deal did not *bring to light* any startling facts.

- A.Prove
- B.Probe
- C.Highlight
- D.Disclose

Answer: Option D

12.The class could not *keep a straight face* on hearing the strange pronunciation of the new teacher.

- A.remain silent
- B.remain serious
- C.remain mute
- D.remain disturbed

Answer: Option B

13.Harassed by repeated acts of injustice. he decided to *put his foot down*.

- A.not to yield
- B.Resign
- C.to accept the proposal unconditionally

- D.Withdraw

Answer: Option A

14.The new C.M *stuck his neck out* today and promised 10kgs. free wheat a month for all rural families.

- A.took an oath
- B.took a risk
- C.extended help
- D.caused embarrassment

Answer: Option B

15.The dacoit murdered the man *in cold blood*.

- A.coldly
- B.boldly
- C.ruthlessly
- D.deliberately

Answer: Option C

16.He has built a big business empire by his *sharp practices*.

- A.extreme hard work
- B.keen business skills
- C.dishonest dealings
- D.sharp intelligence

Answer: Option C

17.The secretary and the treasurer are *hand in glove* with each other.

- A.very good friends
- B.constantly fighting
- C.associates in some action
- D.suspicious of each other

Answer: Option A

18.He never liked the idea of keeping his wife *under his thumb* and so he let her do what she liked.

- A.Pressed down
- B.Unduly under control
- C.Below his thumb
- D.Under tyrannical conditions.

Answer: Option B

19.It is time that professors came down from their *ivory towers* and studied the real needs of the students.

- A.Detachment and seclusion
- B.A tower made of ivory
- C.Prison
- D.Dream lands

Answer: Option A

20.You have to be a *cool customer* and be patient if you want to get the best buys.

- A.Be calm and not be excitable
- B.Have a cool head
- C.Be uncommunicative
- D.Be choosy

Answer: Option A

SYNONYMS

1.AUGUST

- A.Common
- B.Ridiculous
- C.Dignified
- D.Petty

Answer: Option C

2.KEN

A.Ignorance	B. Witness	A.Quarrelsome	B. Rash
C.Trial	D.Knowledge	C.Disrespectful	D.Noisy
Answer: Option D			
3.VENT			
A.Opening	B.Stodge	A.Smuldering	B.Glittering
C.End	D.Past tense of go	C.Touching	D.Warming
Answer: Option A			
4.EMBEZZLE			
A.Misappropriate	B.Balance	A.Hot	B.Warm
C.Remunerate	D.Clear	C.Cold	D.Boiling
Answer: Option A			
Explanation:			
Main Entry: embezzle		Answer: Option B	
Part of Speech: verb		13.TEPID	
Definition: steal money, often from employer		A.Hot	B.Warm
Synonyms: abstract, defalcate, filch, forge, loot, misapply, misappropriate , misuse, peculate, pilfer, purloin, put hand in cookie jar, put hand in till, skim, thieve		C.Cold	D.Boiling
Antonyms: compensate, give, pay, reimburse, return		Answer: Option B	
5.RABBLE		14.IMPROMPTU	
A.Mob	B.Noise	A.Offhand	B.Unimportant
C.Roar	D.Rubbish	C.Unreal	D.Effective
Answer: Option A			
6.MAYHEM			
A.Jubilation	B.Havoc	Answer: Option A	
C.Excitement	D.Defeat	15.INTIMIDATE	
Answer: Option B		A.To hint	B.Frighten
7.CORPULENT		C.Bluff	D.Harass
A.Lean	B.Gaunt	Answer: Option B	
C.Emaciated	D.Obese	16.OMBAT	
Answer: Option D		A.Conflict	B.Quarrel
8.ZANY		C.Feud	D.Fight
A.Clown	B.Pet	Answer: Option D	
C.Thief	D.Magician	17. REPEATED QUESTION	
Answer: Option A		18.CONNOISSEUR	
9.MELD		A.Ignorant	B.Lover of art
A.To soothe	B.Merge	C.Interpreter	D.Delinquent
C.Purchase	D.Glisten	Answer: Option B	
Answer: Option B		19.REPERCUSSION	
10.FRUGALITY		A.Clever reply	B.Recollection
A.Foolishness	B.Extremity	C.Remuneration	D.Reaction
C.Enthusiasm	D.Economy	Answer: Option D	
Answer: Option D		20.WARY	
11.CANTANKEROUS		A.Sad	B.vigilant
		C.Distorted	D.Tired
Answer: Option B		Answer: Option B	
21.RABBLE		21.RABBLE	
		A.Mob	B.Noise
		C.Roar	D.Rubbish
Answer: Option A		Answer: Option A	
22.PONDER		22.PONDER	

- A.Think
C.Anticipate
B.Evaluate
D.Increase

Answer: Option A

23.LAUD

- A.Lord
C.Praise
B.Eulogy
D.Extolled

Answer: Option C

24.LYNCH

- A.Hang
C.Kill
B.Madden
D.Shoot

Answer: Option C

25.

DESTITUTION

- A.Humility
C.Poverty
B.Moderation
D.Beggary

Answer: Option C

Explanation:

Destitution: Poverty so extreme that one lacks the means to provide for oneself.

26.

DEIFY

- A.Flatter
C.Worship
B.Challenge
D.Face

Answer: Option C

27.

HARBINGER

- A.Messenger
C.Forerunner
B.Steward
D.Pilot

Answer: Option C

28.

TACITURNITY

- A.Dumbness
C.Hesitation
B.Changeablemess
D.Reserve

Answer: Option D

29.

RANT

- A.Praise inordinately
C.To preach noisily
B.Formalise
D.Treat with screen

Answer: Option C

30.

REFECTORY

- A.Restaurant
C.Living Room
B.Parlour
D.Dining Room

Answer: Option D

Explanation:

A refectory is a large room in a school, university, or other institution, where meals are served and eaten.

ANTONYMS

1.
HYPOCRITICAL
A.Gentle
C.Amiable
B.Sincere
D.Dependable

- Answer:** Option B
2.
IMPASSE

- A.Resurgence
C.Continuation
B.Breakthrough
D.Combination

- Answer:** Option B
3.NIGGARDLY

- A.Frugal
C.Stingy
B.Thrifty
D.Generous

- Answer:** Option D
4.STARTLED

- A.Amused
C.Endless
B.Relaxed
D.Astonished

- Answer:** Option B
5.NIGGARDLY

- A.Frugal
C.Stingy
B.Thrifty
D.Generous

- Answer:** Option D
6.LOQUACIOUS

- A.Reticent
C.Garrulous
B.Talkative
D.Verbose

- Answer:** Option A
7.CULPABLE

- A.Defendable
C.Careless
B.Blameless
D.Irresponsible

- Answer:** Option B
8.QUIESCENT

- A.ACTIVE
C.Weak
B.Dormant
D.Unconcerned

- Answer:** Option A
9.MORTAL

- A.Divine
C.Spiritual
B.Immortal
D.Eternal

- Answer:** Option B

10.ZENITH		A.Scaly	B.Bald
A.Acme	B.Top	C.Erudite	D.Quiet
C.Nadir	D.Pinnacle	Answer: Option B	
Answer: Option C		20.	
11.RELINQUISH		ACQUITTED	
A.Abdicate	B.Renounce	A.Freed	B.Burdened
C.Posses	D.Deny	C.Convicted	D.Entrusted
Answer: Option C		Answer: Option C	
12.EXODUS		21.	
A.Influx	B.Home-coming	INSIPID	
C.Return	D.Restoration	A.Tasty	B.Stupid
Answer: Option A		C.Discreet	D.Feast
13.PERENNIAL		Answer: Option A	
A.Frequent	B.Regular	22.FRUGAL	
C.Lastng	D.Rare	A.Copious	B.Extravagant
Answer: Option D		C.Generous	D.Ostentatious
14.		Answer: Option B	
BENIGN		23.TANGIBLE	
A.Malevolent	B.Soft	A.Ethereal	B.Concrete
C.Friendly	D.Unwise	C.Actual	D.Solid
Answer: Option A		Answer: Option A	
15.		24.INDISCREET	
EXTRICATE		A.Reliable	B.Honest
A.Manifest	B.Palpable	C.Prudent	D.Stupid
C.Release	D.Entangle	Answer: Option C	
Answer: Option D		25.EQUANIMITY	
16.		A.Resentment	B.Dubiousness
EVASIVE		C.Duplicity	D.Excitement
A.Free	B.Honest	Answer: Option D	
C.Liberal	D.Frank	26.FLIMSY	
Answer: Option B		A.Frail	B.Filthy
17.		C.Firm	D.Flippant
GREGARIOUS		Answer: Option C	
A.Antisocial	B.Glorious	27.HAPLESS	
C.Horrendous	D.Similar	A.Cheerful	B.Consistent
Answer: Option A		C.Fortunate	D.Shapely
18.		Answer: Option C	
REPRESS		28.HOSTILITY	
A.Inhibit	B.Liberate	A.Courtesy	B.Hospitality
C.Curb	D.Quell	C.Relationship	D.Friendliness
Answer: Option B		Answer: Option D	
19.		29.VANITY	
HIRSUTE		A.Pride	B.Humility

C.Conceit

Answer: Option B

30.HYPOCRITICAL

A.Gentle

C.Amiable

Answer: Option B

D.Ostentious

B.Sincere

D.Dependable

C.Have others being imitated by you?

D.Were others being imitated by you?

Answer: Option B

6.

She makes cakes every Sunday.

A.Every Sunday cakes made by her.

B.Cakes are made by her every Sunday.

C.Cakes make her every Sunday.

D.Cakes were made by her every Sunday.

Answer: Option B

7.Darjeeling grows tea.

A.Tea is being grown in Darjeeling.

B.Let the tea be grown in Darjeeling.

C.Tea is grown in Darjeeling.

D.Tea grows in Darjeeling.

Answer: Option C

8.Who is creating this mess?

A.Who has been created this mess?

B.By whom has this mess been created?

C.By whom this mess is being created?

D.By whom is this mess being created?

Answer: Option D

9.A child could not have done this mischief.

A.This mischief could not be done by a child.

B.This mischief could not been done by a child.

C.This mischief could not have been done by a child.

D.This mischief a child could not have been done.

Answer: Option C

10.You can play with these kittens quite safely.

A.These kittens can played with quite safely.

B.These kittens can play with you quite safely.

C.These kittens can be played with you quite safely.

D.These kittens can be played with quite safely.

Answer: Option D

11.After driving professor Kumar to the museum she dropped him at his hotel.

A.After being driven to the museum, Professor Kumar was dropped at his hotel.

B.Professor Kumar was being driven dropped at his hotel.

C.After she had driven Professor Kumar to the museum she had dropped him at his hotel.

D.After she was driven Professor Kumar to the museum she had dropped him at his hotel.

Answer: Option A

12.I remember my sister taking me to the museum.

A.I remember I was taken to the museum by my sister.

B.I remember being taken to the museum by my sister.

CHANGE OF VOICE

In the questions below the sentences have been given in Active/Passive voice. From the given alternatives, choose the one which best expresses the given sentence in Passive/Active voice.

1.

Could you buy some stamps for me?

A.Stamps should be bought.

B. You are requested to buy some stamps.

C. You are ordered to buy some stamps.

D.Stamps could be bought.

Answer: Option B

2.

She spoke to the official on duty.

A.The official on duty was spoken to by her

B. The official was spoken to by her on duty.

C.She was spoken to by the official on duty.

D.She was the official to be spoken to on duty.

Answer: Option A

3.

He is said to be very rich.

A.He said he is very rich.

B. People say he is very rich.

C.He said it is very rich.

D.People say it is very rich.

Answer: Option B

4.

You need to clean your shoes properly.

A.Your shoes are needed to clean properly.

B. You are needed to clean your shoes properly.

C.Your shoes need to be cleaned properly.

D.Your shoes are needed by you to clean properly

Answer: Option C

5.

Do you imitate others?

A.Are others being imitated by you?

B. Are others imitated by you?

C.I remember myself being taken to the museum by my sister.
D.I remember taken to the museum by my sister.

Answer: Option B

13.They have built a perfect dam across the river.

- A.Across the river a perfect dam was built.
- B.A perfect dam has been built by them across the river.
- C.A perfect dam should have been built by them.
- D.Across the river was a perfect dam.

Answer: Option B

14.The invigilator was reading out the instructions.

- A.The instructions were read by the invigilator.
- B.The instructions were being read out by the invigilator.
- C.The instructions had been read out by the invigilator.
- D.The instructions had been read by the invigilator.

Answer: Option B

15.James Watt discovered the energy of steam.

- A.The energy of steam discovered James Watt.
- B.The energy of steam was discovered by James Watt.
- C.James Watt was discovered by the energy of steam.
- D.James Watt had discovered energy by the steam.

Answer: Option B

CHANGE OF SPEECH

In the questions below the sentences have been given in Direct/Indirect speech. From the given alternatives, choose the one which best expresses the given sentence in Indirect/Direct speech.

1.The boy said, "Who dare call you a thief?"

- A.The boy enquired who dared call him a thief.
- B.The boy asked who called him a thief.
- C.The boy told that who dared call him a thief.
- D.The boy wondered who dared call a thief.

Answer: Option A

2.He prayed to God that he might live long.

- A.He prayed, "He may have a long life".
- B.He said, "May you live long."
- C.He said, "May I live a long life."
- D.He said, "Will you live long."

Answer: Option B

3.The man said, "No, I refused to confers guilt."

- A.The man emphatically refused to confers guilt.
- B.The man refused to confers his guilt.
- C.The man told that he did not confers guilt.
- D.The man was stubborn enough to confers guilt.

Answer: Option A

4.He exclaimed with joy that India had won the Sahara Cup.

- A.He said, "India has won the Sahara Cup"
- B.He said, "India won the Sahara Cup"
- C.He said, "How! India will win the Sahara Cup"
- D.He said, "Hurrah! India has won the Sahara Cup"

Answer: Option D

5.The little girl said to her mother, "Did the sun rise in the East?"

- A.The little girl said to her mother that the sun rose in the East.
- B.The little girl asked her mother if the sun rises in the East.
- C.The little girl said to her mother if the sun rises in the East.
- D.The little girl asked her mother if the sun is in the East.

Answer: Option B

6.Dhruv said that he was sick and tired of working for that company.

- A.Dhruv said, "I am sick and tired of working for this company."
- B.Dhruv said, "He was tired of that company."
- C.Dhruv said to me, "I am sick and tired of working for this company."
- D.Dhruv said, "I will be tired of working for that company."

Answer: Option A

7.She said to him, "Why don't you go today?"

- A.She asked him why he did not go that day.
- B.She said to him why he don't go that day.
- C.She asked him not to go that day.
- D.She asked him why he did not go today.

Answer: Option A

8."Are you alone, my son?" asked a soft voice close behind me.

- A.A soft voice asked that what I was doing there alone.
- B.A soft voice said to me are you alone son.
- C.A soft voice from my back asked If I was alone.
- D.A soft voice behind me asked If I was alone.

Answer: Option D

9.She exclaimed with sorrow that was a very miserable plight.

- A.She said with sorrow, "What a pity it is."
- B.She said, "What a mystery it is."
- C.She said, "What a miserable sight it is."
- D.She said, "What a miserable plight it is."

Answer: Option D

10.She said that she would finish the work the next day

- A. she said "I will finish the work the next day"
- B. she said "I will finish the work the tomorrow"
- C. she said "you will finish the work the next day"
- D. she said "I finished the work"

Answer: option A

11."If you don't keep quite I shall shoot you", he said to her in a calm voice.

- A.He warned her to shoot if she didn't keep quite calmly.
- B.He said calmly that I shall shoot you if you don't be quite.
- C.He warned her calmly that he would shoot her if she didn't keep quite.
- D.Calmly he warned her that be quite or else he will have to shoot her.

Answer: Option C

12.I told him that he was not working hard.

- A.I said to him, "You are not working hard."
- B.I told to him, "You are not working hard."
- C.I said, "You are not working hard."
- D.I said to him, "He is not working hard."

Answer: Option A

13.

His father ordered him to go to his room and study.

- A.His father said, "Go to your room and study."
- B.His father said to him, "Go and study in your room."
- C.His father shouted, "Go right now to your study room"
- D.His father said firmly, "Go and study in your room."

Answer: Option A

14.

He said to his father, "Please increase my pocket-money."

- A.He told his father, "Please increase the pocket-money"
- B.He pleaded his father to please increase my pocket money.
- C.He requested his father to increase his pocket-money.
- D.He asked his father to increase his pocket-money.

Answer: Option C

15.

She said that her brother was getting married.

- A.She said, "Her brother is getting married."
- B.She told, "Her brother is getting married."
- C.She said, "My brother is getting married."
- D.She said, "My brother was getting married."

Answer: Option C

LETTER AND SYMBOL SERIES

In these series, you will be looking at both the letter pattern and the number pattern. Fill the blank in the middle of the series or end of the series.

1.DEF, DEF₂, DE₂F₂, _____, D₂E₂F₃

- A.DEF₃
- B.D₃EF₃
- C.D₂E₃F
- D.D₂E₂F₂

Answer: Option D

Explanation: In this series, the letters remain the same: DEF. The subscript numbers follow this

series:

111, 112, 122, 222, 223, 233, 333, ...

2.ZA₅, Y₄B, XC₆, W₃D, _____

A.E₇V

B.V₂E

C.VE₅

D.VE₇

Answer: Option D

Explanation: There are three series to look for here. The first letters are alphabetical in reverse: Z, Y, X, W, V. The second letters are in alphabetical order, beginning with A. The number series is as follows: 5, 4, 6, 3, 7.

3.QAR, RAS, SAT, TAU, _____

A.UAV

B.UAT

C.TAS

D.TAT

Answer: Option A

Explanation: In this series, the third letter is repeated as the first letter of the next segment. The middle letter, A, remains static. The third letters are in alphabetical order, beginning with R.

4.

P₅QR, P₄QS, P₃QT, _____, P₁QV

A.PQW

B.PQV₂

C.P₂QU

D.PQ₃U

Answer: Option C

Explanation: The first two letters, PQ, are static. The third letter is in alphabetical order, beginning with R. The number series is in descending order beginning with 5.

5.

BCB, DED, FGF, HIH, _____

A.JKJ

B.HJH

C.IJI

D.JHJ

Answer: Option A

Explanation: This series consists of a simple alphabetical order with the first two letters of all segments: B, C, D, E, F, G, H, I, J, K. The third letter of each segment is a repetition of the first letter.

6.

JAK, KBL, LCM, MDN, _____

A.OEP

B.NEO

C.MEN

D.PFQ

Answer: Option B

Explanation: This is an alternating series in alphabetical order. The middle letters follow the order ABCDE. The first and third letters are alphabetical beginning with J. The third letter is repeated as a first letter in each subsequent three-letter segment.

7.

QPO, NML, KJI, _____, EDC

A.HGF

B.CAB

C.JKL

D.GHI

Answer: Option A

Explanation: This series consists of letters in a reverse alphabetical order.

8. CMM, EOO, GQQ, ____, KUU

A.GRR

C.ISS

B.GSS

D.ITT

Answer: Option C

Explanation: The first letters are in alphabetical order with a letter skipped in between each segment: C, E, G, I, K. The second and third letters are repeated; they are also in order with a skipped letter: M, O, Q, S, U.

9.

ELFA, GLHA, ILJA, ____, MLNA

A.OLPA

C.LLMA

B.KLMA

D.KLLA

Answer: Option D

Explanation: The second and forth letters in the series, L and A, are static. The first and third letters consist of an alphabetical order beginning with the letter E.

10.

FAG, GAF, HAI, IAH, ____

A.JAK

C.HAK

B.HAL

D.JAI

Answer: Option A

Explanation: The middle letters are static, so concentrate on the first and third letters. The series involves an alphabetical order with a reversal of the letters. The first letters are in alphabetical order: F, G, H, I, J. The second and fourth segments are reversals of the first and third segments. The missing segment begins with a new letter.

11.

B₂CD, ____, BCD₄, B₅CD, BC₆D

A.B₂C₂D

C.B₂C₃D

B.BC₃D

D.BCD₇

Answer: Option B

Explanation:

Because the letters are the same, concentrate on the number series, which is a simple 2, 3, 4, 5, 6 series, and follows each letter in order.

ESSENTIAL PART

1. orchestra

A.violin

C.musician

B.stage

D.soloist

Answer: Option C

Explanation:

An orchestra is a large group of musicians, so musicians are essential. Although many orchestras have violin sections, violins aren't essential to an orchestra (choice a). Neither a stage (choice b) nor a soloist (choice d) is necessary.

2. provisions

A.groceries

C.gear

B.supplies

D.Caterers

Answer: Option B

Explanation:

Provisions imply the general supplies needed, so choice b is the essential element. The other choices are byproducts, but they are not essential.

3. infirmary

A.surgery

C.patient

B.disease

D.receptionist

Answer: Option C

Explanation:

An infirmary is a place that takes care of the infirm, sick, or injured. Without patients, there is no infirmary. Surgery (choice a) may not be required for patients. A disease (choice b) is not necessary because the infirmary may only see patients with injuries. A receptionist (choice d) would be helpful but not essential.

4. sustenance

A.nourishment

C.grains

B.water

D.menu

Answer: Option A

Explanation:

Sustenance is something, especially food, that sustains life or health, so nourishment is the essential element. Water and grains (choices b and c) are components of nourishment, but other things can be taken in as well. A menu (choice d) may present a list of foods, but it is not essential to sustenance.

5. purchase

A.trade

C.bank

B.money

D.acquisition

Answer: Option D

Explanation: A purchase is an acquisition of something. A purchase may be made by trade (choice a) or with money (choice b), so those are not essential elements. A bank (choice c) may or may not be involved in a purchase.

6. dimension

A.compass

C.inch

B.ruler

D.measure

Answer: Option D

Explanation: A dimension is a measure of spatial content. A compass (choice a) and ruler (choice b) may help determine the dimension, but other instruments may also be used, so these are not the essential element here. An inch (choice c) is only one way to determine a dimension.

7. bonus

A.reward

C.cash

B.raise

D.employer

Answer: Option A

C.laces
Answer: Option A

Explanation:
All shoes have a sole of some sort. Not all shoes are made of leather (choice b); nor do they all have laces (choice c). Walking (choice d) is not essential to a shoe.

20. swimming

A.pool
C.water

B.bathing suit
D.life jacket

Answer: Option C

Explanation: Water is essential for swimming-without water, there is no swimming. The other choices are things that may or may not be present.

D.walking

Answer: Option A

6.A. Klaptomania
B. Klepptomania
C. Kleptemania
D. Kleptomania

Answer: Option D

Explanation:
Kleptomania: A recurrent urge to steal, typically without regard for need or profit.

7.

A.Eflorescence
C.Efflorescence

B.Efflorescence
D.Efflorascence

Answer: Option C

Explanation: Efflorescence - flowering, blossoming

8.

A.Exterminatte
C.Offspring

B.Inexplicable
D.Reffere

Answer: Option C

9.
A.Treachrous
C.Trechearous

B.Trecherous
D.Treacherous

Answer: Option D

Explanation: Treacherous means guilty of or involving betrayal or deception.

10.

A.Rigerous
C.Regerous

B.Rigourous
D.Rigorous

Answer: Option D

11.
A.Treachrous
C.Trechearous

B.Trecherous
D.Treacherous

Answer: Option D

Explanation: Treacherous means guilty of or involving betrayal or deception.

12.

A.Rigerous
C.Regerous

B.Rigourous
D.Rigorous

Answer: Option D

13.
A.Palete
C.Palate

B.Palet
D.Pelate

Answer: Option C

14.
A.Bouquete
C.Bouquet

B.Bouquette
D.Boqqet

Answer: Option C

SPELLINGS

EXERCISE I

Find the correctly spelt words.

1. (solve as per the direction given above)

A.Indispensable
C.Indispansible

B. Indipenseble
D.Indispensable

Answer: Option D

2. (solve as per the direction given above)

A.Itinarery
C.Itenary

B. Itinerary
D.Itinrary

Answer: Option B

Explanation:

Itinerary - of a trip, of a journey, of travelling, of the route taken on a journey.

3. (solve as per the direction given above)

A.Survaillance
C.Surveillance

B. Surveillance
D.Surveilance

Answer: Option B

Explanation:

Surveillance - careful observation of a person or group, supervision.

4. (solve as per the direction given above)

A.Sepulchral
C.Sepalchrul

B. Sepilchrle
D.Sepalchrl

Answer: Option A

Explanation:

Sepulchral - pertaining to a grave or tomb. (or) serving as a grave or tomb.

5. A. Judicious

B. Cancious

C. Dilicous

D. Gracious

Explanation: Bouquet - bunch of flowers, nosegay, fragrance of a wine, compliment.

15.

- | | |
|--------------|----------------|
| A.Chancery | B. Chancellery |
| C.Chancelery | D.Chancellary |

Answer: Option B

EXERCISE II

In each questions below five words are given. Find out that word, the spelling of which is WRONG. The letter of that word is the answer. If all the four words are spelt correctly, the answer is 'E', i.e., "All Correct".

1. (solve as per the direction given above)

- | | |
|------------|--------------|
| A.Immature | B. Imminent |
| C.Ilicit | D.Imperative |

E. All correct

Answer: Option C

Explanation:

Illicit

2.

- | | |
|--------------|---------------|
| A.Quarreled | B. Rebellious |
| C.Commission | D.Miraculous |

E. All correct

Answer: Option D

Explanation:

Miraculous

3.

- | | |
|------------|----------------|
| A.Lenient | B. Nationalism |
| C.Overhaul | D.Transferred |

E. All correct

Answer: Option D

Explanation:

Transferred

4.

- | | |
|-----------|-----------|
| A.Refuse | B. Repute |
| C.Despute | D.Confuse |

E. All correct

Answer: Option C

Explanation:

Dispute

5.

- | | |
|---------|----------|
| A.Urge | B. Merge |
| C.Perge | D.Surge |

E. All correct

Answer: Option C

Explanation:

Purge

6.

- | | |
|------------------|-------------|
| A.Aristocracy | B. Prophecy |
| C.Beaureaccuracy | D.Democracy |

E. All correct

Answer: Option C

Explanation:

Bureaucracy

7.

- | | |
|------------|-------------|
| A.Narrator | B. Overseer |
| C.Pretence | D.Licence |

E. All correct

Answer: Option E

8.

- | | |
|---------------|----------------|
| A.Burglar | B. Designation |
| C.Controversy | D.Ratificasion |

E. All correct

Answer: Option D

Explanation: Ratification

9. (solve as per the direction given above)

- | | |
|-------------|--------------|
| A.Periphery | B. Advurtise |
| C.Courteous | D.Indefinite |

E. All correct

Answer: Option B

Explanation: Advertise

10.

- | | |
|----------------|-----------------|
| A.Psychologist | B. Psychaitrist |
| C.Physiologist | D.Psychoanalyst |

E. All correct

Answer: Option B

Explanation: Psychiatrist

11.

- | | |
|-------------|------------|
| A.Geography | B. History |
| C.Chemistry | D.Commerce |

E. All correct

Answer: Option E

12.

- | | |
|-----------|------------|
| A.Amature | B. Manual |
| C.Nephew | D.Athletic |

E. All correct

Answer: Option A

Explanation: Amateur

13.
 A.Appraise
 C.Mentanence
 E. All correct
Answer: Option C
Explanation: Maintenance
14.
 A.Inflamable
 C.Righteousness
 E. All correct
Answer: Option A
Explanation:
 Inflammable
15.
 A.Passion
 C.Ration
 E. All correct
Answer: Option D
Explanation:
 Tuition
- B. Command
 D.Behavior
- B. Musician
 D.Negotiate
- B. Fashion
 D.Tution
- A.I have got
 C.in 1988.
Answer: Option A
Explanation: I got
5.
 (solve as per the direction given above)
 A.Having received your letter
 C.to thank you for the same.
Answer: Option D
Explanation:
6.
 A.If you lend him a book
 C.and never you will get it back.
Answer: Option C
Explanation: and you will never get it back
7.
 A.Block of Residential flats
 C.near our house.
Answer: Option A
Explanation:
 Blocks of Residential flats
8.
 A.Do the roses in your garden smell
 C.than those in ours?
Answer: Option B
Explanation: sweeter
9.
 A.According to the Bible
 C.who shall inherit the earth.
Answer: Option B
Explanation: It is the meek and the humble
10.
 A.None of the students attending your class
 B.answered your questions
 C.did they?
 D.No error.
Answer: Option C
Explanation: 'did one' or 'did any'
11.
 A.He is working in
 C.for the past several months.
Answer: Option A
Explanation:
- B.my M.Sc. degree
 D.No error.
- B.this morning, we are writing
 D.No error.
- B.he will lend it to some one else
 D.No error.
- B.are coming up
 D.No error
- B.more sweetly
 D.No error.
- B.it is meek and humble
 D.No error.
- B.a bank in New Delhi
 D.No error.

SPOTTING ERRORS

1. Read the each sentence to find out whether there is any grammatical error in it. The error, if any will be in one part of the sentence. The letter of that part is the answer. If there is no error, the answer is 'D'. (Ignore the errors of punctuation, if any).

- 1
 A.If I had known
 C.I will have helped him.
Answer: Option C
Explanation: I would have helped him
- B.this yesterday
 D.No error.

2.
 A.A lot of travel delay is caused
 B.due to the inefficiency and lack of good management
 C.on behalf of the railways.
 D.No error.
Answer: Option C
Explanation: on the part of the railways

- 3.A.One of the members
 C. the Minister was an athiest.
Answer: Option B
Explanation: expressed doubt that
- B.expressed doubt if
 D.No error.

12.

- A.A large scale exchange of nuclear weapons
- B.will produce unprecedented amounts of radiation
- C.that can penetrate into the biological tissue.
- D.No error.

Answer: Option C

Explanation:

that can penetrate the biological tissue

13.

- A.The person which was
- B.recommended for the position
- C.did not fulfil the prescribed qualifications.
- D.No error.

Answer: Option A

Explanation:

The person who was

14.

- A.Supposing if
- B. there is no bus.
- C.how will you get there?
- D.No error.

Answer: Option A

Explanation: if

15.

- A.One of my favourite actor
- B. is acting
- C.in this play also.
- D.No error.

Answer: Option A

Explanation: one of my favourite actors

16.

- A.Emphasis on equality of life ensures
- B.for the health and happiness
- C.of every individual.
- D.No error.

Answer: Option B

Explanation: the health and happiness

17.

- A.Because of the emergency help
- B. that the patient received
- C.he would have died
- D.No error.

Answer: Option A

Explanation: But for emergency help

18.

- A.He was in such hurry
- B. that he didn't
- C.wait for me
- D.No error.

Answer: Option A

Explanation: He was in such a hurry.

19.

- A.Few scientists changed
- B.people's ideas as much as
- C.Darwin with his Theory of Evolution.
- D.No error.

Answer: Option A

Explanation: Few scientists have changed

20.

- A.The course provide
- B.not only theoretical inputs
- C.but also practical training
- D.No error.

Answer: Option A

Explanation: The course provides

ORDERING OF WORDS

In each question below, there is a sentence of which some parts have been jumbled up.

Rearrange these parts which are labelled P, Q, R and S to produce the correct sentence. Choose the proper sequence.

1.

In the darkness

P : the long, narrow beard

Q : was clearly visible with

R : the tall stooping figure of the doctor

S : and the aquiline nose

The Proper sequence should be:

A.RQPS

B.PSQR

C.RSQP

D.QPRS

Answer: Option A

2.

We have to

P : as we see it

Q : speak the truth

R : there is falsehood and weakness

S : even if all around us

The Proper sequence should be:

A.RQSP

B.QRPS

C.RSQP

D.QPSR

Answer: Option D

3.

It is not, therefore

P : that I pay a tribute

Q : to conductors as a class

R : with any feeling of unfriendliness

S : to a particular member of that class

The Proper sequence should be:

A.PQRS

C.RSPQ

Answer: Option C

4.

He knew that

P : and then to save himself

Q : was to save all the lives

R : entrusted to his care

S : the duty of a captain

The Proper sequence should be:

A.PQRS

C.SPRQ

Answer: Option B

5.

He told us that

P : and enjoyed it immensely

Q : in a prose translation

R : he had read Milton

S : which he had borrowed from his teacher

The Proper sequence should be:

A.RSQP

C.RQSP

Answer: Option C

6.

When it began to rain suddenly on the first of January

P : to celebrate the new year

Q : we ran for shelter

R : to the neighbouring house

S : where many people had gathered

The Proper sequence should be:

A.QRPS

C.PRSQ

Answer: Option D

B.RQPS

D.PSRQ

7.

Of many artists

P : those who impressed me the most

Q : I was a child

R : but those with unique personalities off stage

S : were not always the successful ones

The Proper sequence should be:

A.SRQP

C.RSPQ

Answer: Option D

8.

It is easy to excuse

P : but it is hard

Q : in a boy of fourteen

R : the mischief of early childhood

S : to tolerate even unavoidable faults

The Proper sequence should be:

A.RPQS

C.QRPS

Answer: Option D

9.

The majestic mahogany table

P : belongs to an old prince

Q : which has one leg missing

R : who is no impoverished

S : but not without some pride

The Proper sequence should be:

A.PQSR

C.PRSQ

Answer: Option D

10.

It would

P : appear from his statement

Q : about the policy of management

R : in dealing with the strike

S : that he was quite in the dark

The Proper sequence should be:

A.RPSQ

B.PSQR

C.RQPS

Answer: Option B

11.

Education is

P : of the proper sense of responsibilities

Q : the first need

R : in a citizen

S : for the development

The Proper sequence should be:

A.SQPR

C.QSPR

Answer: Option C

12.

He was so kind and generous that

P : he not only

Q : made others do so

R : but also

S : helped them himself

The Proper sequence should be:

A.PSRQ

C.PRSQ

Answer: Option A

13.

We went

P : along the railway line

Q : and had a right to

R : where other people not allowed to go

S : but daddy belonged to the railway

The Proper sequence should be:

A.RPQS

C.RSQP

Answer: Option B

14.

There was

P : needed for it everyday life

Q : a time when each family

R : for itself most of the things it

S : actually produced

D.PRQS

The Proper sequence should be:

A.QRSP

C.RSPQ

Answer: Option D

15.

Little

P : that he had been let down

Q : stood by all these years

R : did he realise

S : by a colleague whom he had

The Proper sequence should be:

A.RPSQ

C.QSRP

Answer: Option A

16.

It is very easy

P : a great deal more than one realises

Q : may mean

R : that a phrase that one does not quite understand

S : to persuade oneself

The Proper sequence should be:

A.RSQP

C.SRQP

Answer: Option B

B.RQPS

D.QSRP

B.SPQR

D.RQPS

17.

work is the one thing

P : and without it

Q : that is necessary

R : to keep the world going

S : we should all die

The Proper sequence should be:

A.QPSR

C.SRPQ

Answer: Option D

B.RPQS

D.QRPS

18.

The appearance

P : this dinosaurs were at their peak

Q : of the first mammals on the earth

R : at the time when

S : went almost unnoticed

The Proper sequence should be:

A.SRPQ

C.QRPS

Answer: Option C

19.

By this time

P : at the railway station

Q : reported mass looting

R : reports of violence were flooding in

S : which police dispatches

The Proper sequence should be:

A.RSPQ

C.SQRP

Answer: Option C

20.

Women

P : till the other day

Q : who were content being housewives

R : about spending their time cooking

S : now sound apologetic

The Proper sequence should be:

A.PQRS

C.QPSR

Answer: Option C

B.QSRP

D.RPQS

E.No correction required

Answer: Option A

2.

The population of Tokyo is **greater than that of any other** town in the world.

A.greatest among any other

B.greater than all other

C.greater than those of any other

D.greater than any other

E.No correction required

Answer: Option E

3.

The performance of our players was rather **worst than I had expected**.

A.bad as I had expected

B.worse than I had expected

C.worse than expectation

D.worst than was expected

E.No correction required

Answer: Option B

4.

Why **did you not threw** the bag away?

A.did you not throw

B.had you not threw

C.did you not thrown

D.you did not thrown

E.No correction required

Answer: Option A

5.

Shapes of gods and goddess are worshipped by people.

A.Images

B.Reflections

C.Clay shapes

D.Clay toys

E.No correction required

Answer: Option A

6.

The intruder stood quietly **for few moments**

A.for few time

B.for the few moments

C.for moments

D.for a few moments

E.No correction required

Answer: Option D

7.

The police has **so far succeeded in recovering** only a part of the stolen property.

A.thus far succeeded for recovery

B.so far succeeded in recovery of

C.as for as succeeded in recovery of

D.so far succeeded to recover

E.No correction required

Answer: Option E

8.

SENTENCE CORRECTION

Which of phrases given below each sentence should replace the phrase printed in **bold** type to make the grammatically correct? If the sentence is correct as it is, mark 'E' as the answer.

1.

He is too important **for tolerating** any delay.

A.to tolerate

B. to tolerating

C.at tolerating

D.with tolerating

Despite of their differences on matters of principles, they all agree on the demand of hike is salary?

- A.Despite their
- B.Despite of the
- C.Despite for their
- D.Despite off their
- E.No correction required

Answer: Option A

9.

The world has seen **small** real attempt at population and resource planning.

- A.Few
- B.little
- C.Less
- D.a few
- E.No correction required

Answer: Option B

10.

We don't know **how did the thief made** an escape.

- A.how the thief did make
- B.how the thief does make
- C.how the thief made
- D.how was the thief made
- E.No correction required

Answer: Option C

11.

Their earnings are such that they find it difficult **to make both ends to meet**.

- A.to makings both ends meet
- B.to make both ends for meeting
- C.to make both ends meet
- D.for making both ends to meet
- E.No correction required

Answer: Option C

12.

One of the most significant **phenomenons** of our time has been the development of cinema.

- A.phenomenon
- B.Phenomena
- C.phenomenonna
- D.Phenomenonns
- E.No correction required

Answer: Option B

13.

This is one of the most important **inventions of this century**.

- A.invention of this century
- B.invention of these century
- C.invention of centuries
- D.invention of the centuries
- E.No correction required

Answer: Option E

14.

If you are thinking about investigation overseas, **isn't it makes** sense to find an experience guide?

- A.it is not making
- B.doesn't it make
- C.does it make
- D.is it making
- E.No correction required

Answer: Option B

SENTENCE IMPROVEMENT

In questions given below, a part of the sentence is *italicized and underlined*. Below are given alternatives to the italicized part which may improve the sentence. Choose the correct alternative. In case no improvement is needed, option 'D' is the answer.

1.

Will you kindly *open* the knot?

- A.Untie
- B.break
- C.Loose
- D.No improvement

Answer: Option A

2.

He *sent a word* to me that he would be coming late.

- A.sent word
- B.had sent a word
- C.sent words
- D.No improvement

Answer: Option A

3.

While crossing the highway a five year old child was knocked *out* by a passing car.

- A.Away
- B.up
- C.Down
- D.No improvement

Answer: Option C

4.

More than one person *was killed* in accident.

- A.were killed
- B.are killed
- C.have been killed
- D.No improvement

Answer: Option A

5.

Five years ago today, I *am sitting* in a small Japanese car, driving across Poland towards Berlin.

- A.was sitting
- B.sat
- C.have been sitting
- D.No improvement

Answer: Option A

6.

Please make it a point to send you letter *at my address*.

- A.on my address
- B.to my address
- C.in my address
- D.No improvement

Answer: Option B

7.

If you are living near a market place you should be ready *to bear* the disturbances caused by traffic.

- A.to bear upon
- B.to bear with
- C.to bear away
- D.No improvement

Answer: Option B

8.

- | | | | | |
|---|--|---------------------------------------|---|------------------|
| I hope you won't object <i>to me watching</i> while you work. | A.against me watching
C.to my watching | B.me to watch
D.No improvement | C.opinion on
Answer: Option B | D.No improvement |
| 9.
You cannot forbid <i>him leaving</i> . | A.he leaving
C.him to leave | B.his leaving
D.No improvement | | |
| Answer: Option C | | | | |
| 10.
You have come here with a view <i>to insult me</i> . | A.to insulting me
C.for insulting me | B.of insulting me
D.No improvement | | |
| Answer: Option A | | | | |
| 11.
20 kms <i>are not a great distance</i> in these days of fast moving vehicles. | A.is not a great distance
C.aren't a great distance | B.is no distance
D.No improvement | | |
| Answer: Option A | | | | |
| 12.
It became clear that the strangers were heading <i>into</i> a serious disaster. | A.Along
C.For | B.towards
D.No improvement | | |
| Answer: Option B | | | | |
| 13.
The dissidents <i>hold</i> a great problem in every political party. | A.Cause
C.Pose | B.give
D.No improvement | | |
| Answer: Option A | | | | |
| 14.
I would have waited for you at the station if I <i>knew</i> that you would come. | A.had known
C.have known | B.was knowing
D.No improvement | | |
| Answer: Option A | | | | |
| 15.
Practically <i>every part</i> of the banana tree is used by man. | A.each part
C.most part | B.any part
D.No improvement | | |
| Answer: Option D | | | | |
| 16.
My <i>opinion for</i> the film is that it will bag the national award. | A.opinion to
B.opinion about | | | |

COMPLETING STATEMENTS

In each question, an incomplete statement (Stem) followed by fillers is given. Pick out the best one which can complete incomplete stem correctly and meaningfully.

1.
It is not easy to remain tranquil when those around you
A.behave in a socially acceptable manner
B. exhibit pleasant mannerism
C. are losing their heads
D.agree to whatever you say
E. exhibit generous and magnanimous gestures

Answer: Option C

2.
Although initial investigations pointed towards him
A.the preceding events corroborated his involvement in the crime
B. the additional information confirmed his guilt
C. the subsequent events established that he was guilty
D.the subsequent events proved that he was innocent
E. he gave an open confession of his crime

Answer: Option D

3.
The weather outside was extremely pleasant and hence we decided
A.utilise our time in watching the television
B. refrain from going out for a morning walk
C.enjoy a morning ride in the open
D.employ this rare opportunity for writing letters
E. remain seated in our rooms in the bungalow

Answer: Option C

4.
Although, he is reputed for making very candid statements
A.his today speech was not fairly audible
B. his promises had always been realistic
C.his speech was very interesting
D.people follow whatever he instructs to them
E. his today's statements were very ambiguous

Answer: Option E

5.
"Anand stuck up a friendship with Mahesh in just 2 days" means ...
A.Anand friendship with Mahesh came to an end recently
B. Anand found out the other friends of Mahesh

10. 1. was 2. and 3. Suresh

4. kind 5. loving

A.31425

C.34251

E. 12345

Answer: Option A

Explanation: "Suresh was kind and loving."

B.54213

D.15243

PARAGRAPH FORMATION

Rearrange the following five sentences in proper sequence so as to form a meaningful paragraph, then answer the questions given below them.

1. 1. Participation involves more than the formal sharing of decisions.
2. Through anticipation, individuals or organisations consider trends and make plans, shielding institutions from trauma of learning by shock.
3. Innovative learning involves both anticipation and participation.
4. It is an attitude characterised by cooperation, dialogue and empathy.

A.2314

C.4132

E. 1324

B.1243

D.3214

Answer: Option D

2.

1. 2. But, we all helped in the first few days.
2. Chandrapur is considered as a rural area.
3. Manohar was transferred to his office recently.
4. Initially he was not getting adjusted to the city life.
5. Now, Manohar is very proud of his colleagues.
6. Before that he was working in chandrapur branch of our office.

ANSWER : 362415

3.

1. A Study to this effects suggests that the average white-collar worker demonstrates only about 25% listening efficiency.
2. However for trained and good listeners it is not unusual to use all the three approaches during a setting, thus improving listening efficiency.
3. There are three approaches to listening: Listening for comprehension, Listening for empathy and Listening for evaluation.
4. Although we spend nearly half of each communication interaction listening, we do not listen well.
5. Each approach has a particular emphasis that may help us to receive and process informationin different settings.

ANSWER : 35241

4.

1. John did not have the money to buy the beautiful clip.
2. After a while, Jane explained to John that she had sold her hair to buy a gold chain for his watch.
3. As it was Christmas, john want to give Jane a surprise present.
4. When Jane saw it, she felt like crying.
5. He decided to present her a clip made of ivory for her long flowing hair.
6. He, therefore sold off his watch and brought home the present

ANSWER : 351642

5.

1. The means and methods they employ to deal with public pressures are also different.
2. They will make no move unless the gallery is packed.
3. The poorest are over-hesitant, evasive and preoccupied with their relationships with others.
4. Enourmous difference is generally observed in the ways in which various public officials respond to public pressures.
5. The best possess understanding of forces that must be taken in to account, determination not to be swerved from the path of public interest.
6. They confront all embarrassments with a state general formula.

ANSWER : 413526

6.

1. 6. In his literacy work he spoke of that province of human life which mere intellect does not speak.
2. He has also given innocent joy to many children by his stories like 'Kabuliwalah'
3. These songs are sung not only in bengal but all over the country.
4. Rabindranath's great works sprang from intensity of vision and feelings.
5. He sang of beauty and heroism, nobility and charm.

ANSWER : 41253

7.

1. But by then it was too late to correct things.
2. It is impossible to steer such a large project to success without planning.
3. He had to standby and watch helplessly.
4. The whole scheme was destined, to fail from the beginning.
5. Bhaskar started realising this only towards the end.

ANSWER : 42513

8.

1. Would you steal a software programme out of retail shop?
2. The industry on its part has formed an organisation to specially gather information, educate and drag and software pirates to courts.
3. But more than the legality, there is always a different way of looking at piracy and that is in terms of morality.
4. The Government on the other hand has initiated National Enforcements Committees.
5. As far as the issue of tackling piracy is concerned, both the industry and government have already started initiating action.

ORDERING OF SENTENCES

In questions below, each passage consist of six sentences. The first and sixth sentence are given in the begining. The middle four sentences in each have been removed and jumbled up. These are labelled as P, Q, R and S. Find out the proper order for the four sentences.

1.

S₁: You know my wife, Madhavi, always urged me to give up smoking.

P : I really gave it up.

Q : And so When I went to jail I said to myself I really must give it up, if for no other reason than : of being self-reliant.

R : When I emerged from jail, I wanted to tell her of my great triumph.

S : But when I met her, there she was with a packet of cigarettes.

S₆: poor girl!.

The Proper sequence should be:

- A.PSRQ
C.QPRS

- B.SPQR
D.RSPQ

Answer: Option C

2. S₁: When a satellite is launched, the rocket begins by going slowly upwards through the air.

P : However, the higher it goes, the less air it meets.

Q : As the rocket goes higher, it travels faster.

R : For the atmosphere becomes thinner.

S : As a result there is less friction.

S₆: Consequently, the rocket still does not become too hot.

The Proper sequence should be:

- A.QPRS
C.PQRS

- B.QSPR
D.PQSR

Answer: Option A

3.

S₁: A father having offered to take the baby out in a perambulator, was tempted by the sunny morning to slip into a pub for a glass of beer.

P : Indignant at her husband's behaviour, she decided to teach him a lesson.

Q : She wheeled away the pram.

R : A little later, his wife came by, where to her horror, she discovered her sleeping baby.

S : Leaving the pram outside, he disappeared inside the bar.

S₆: She waited for him, anticipating the white face and quivering lips which would soon appear with the news that the baby had been stolen.

The Proper sequence should be:

- A.SRPQ
C.SPQR

- B.RQPS
D.PQSR

Answer: Option A

4.

S₁: For some time in his youth Abraham Lincoln was manager for a shop.

P : Then a chance Customer would come.

Q : Young Lincoln way of keeping shop was entirely unlike anyone else's

R : Lincoln would jump up and attend to his needs and then revert to his reading.

S : He used to lie full length on the counter of the shop eagerly reading a book.

S₆: Never before had Lincoln had so much time for reading as had then.

The Proper sequence should be:

- A.SRQP
C.SQRP

- B.QSPR
D.QPSR

Answer: Option B

5.

S₁: The city is almost a slum and stinks most of time.

P : The slush on the road did not deter them.

Q : The occasional slips and falls were considered a small price to pay for the trip.

R : They were excited, fascinated by the sight of fresh snow on the roads.

S : Even so, it looked beautiful to tourists of various categories.

S₆: But some visitors came away with the unforgettable sight of young labours scantily clad.

The Proper sequence should be:

- A.RQPS
C.RSQP

- B.QPRS
D.SPQR

Answer: Option D

6.

S₁: Venice is a strange and beautiful city in the north of Italy.

P : There are about four hundred old stone bridges joining the island of Venice.

Q : In this city there are no motor cars, no horses, no buses.

R : These small islands are near one another.

S : It is not an island but a hundred and seventeen islands.

S₆: This is because Venice has no streets.

The Proper sequence should be:

- | | |
|--------|--------|
| A.PQRS | B.PRQS |
| C.SRPQ | D.PQSR |

Answer: Option C

7. S₁: Ants eat worms, centipedes and spiders.

P : They are usually much quicker than the ant itself.

Q : Nevertheless, these animals do not make easy game for ants.

R : Besides, they have an extraordinary number of ways of escaping.

S : They also eat larvae and insect adults such as flies, moths and spring tails.

S₆: Some jump, and some give out a pungent repellent substance.

The Proper sequence should be:

- | | |
|--------|--------|
| A.SQPR | B.SPRQ |
| C.SQRP | D.SRQP |

Answer: Option A

8. S₁: The Hound of Baskervilles was feared by the people of the area.

P : Some people spoke of seeing a huge, shadowy form a Hound at midnight on the moor.

Q : But they spoke of it in tones of horror.

R : Nobody had actually seen the hound.

S : This shadowy form did not reveal any details about the animal.

S₆: The Hound of Baskervilles remains an unsolved mystery.

The Proper sequence should be:

- | | |
|--------|--------|
| A.SPQR | B.SPRQ |
| C.PSRQ | D.PQRS |

Answer: Option D

9. S₁: A gentleman who lived alone always had two plates placed on the table at dinner time.

P : One day just as he sat down to dine, the cat rushed in to the room.

Q : One plate was for himself and other was for his cat.

R : she drooped a mouse into her own plate and another into her master plate.

S : He used to give the cat a piece of meat from his own plate.

S₆: In this way the cat showed her gratitude to her master.

The Proper sequence should be:

- | | |
|--------|--------|
| A.QSPR | B.PSRQ |
|--------|--------|

C.QRSP

D.RPQS

Answer: Option A

10.s1 :While crossing the busy road, we should obey the policeman on duty

P: we should always cross the road at the zebra crossing

Q:we must look to the signal lights and cross the road only when the road is clear

R. if there are no signal lights at the crossing, we should look to the right , then to the left and again the right before crossing the road

S. if the road is not clear we should wait

s6: we should never run while crossing the road

the proper sequence should be

- | | |
|--------|--------|
| A.QSPR | B.PSRQ |
| C.QRSP | D.RPQS |

Answer unavailable

11. S₁: Calcutta unlike other cities kept its trams.

P : As a result there horrendous congestion.

Q : It was going to be the first in South Asia.

R : They run down the centre of the road

S : To ease in the city decided to build an underground railway line.

S₆: The foundation stone was laid in 1972.

The Proper sequence should be:

- | | |
|--------|--------|
| A.PRSQ | B.PSQR |
| C.SQRP | D.RPSQ |

Answer: Option D

12. S₁: Satyajit Ray made several films for children.

P : Later film makers have followed his lead.

Q : Today other nations are making the children's film in a big way.

R : This was at a time when no director considered children as potential audience.

S : Ray was, thus, a pioneer in the field.

S₆: But today few think of Ray as a maker of children's films.

The Proper sequence should be:

- | | |
|--------|--------|
| A.PSRQ | B.RSQP |
| C.RSPQ | D.SQRP |

Answer: Option C

COMPREHENSION

1. In the world today we make health and end in itself. We have forgotten that health is really means to enable a person to do his work and do it well. a lot of modern medicine and this includes many patients as well as many physicians pays very little attention to health but very

much attention to those who imagine that they are ill. Our great concern with health is shown by the medical columns in newspapers, the health articles in popular magazines and the popularity of television programmes and all those books on medicine. We talk about health all the time. Yet for the most part the only result is more people with imaginary illness. The healthy man should not be wasting time talking about health: he should be using health for work. The work does the work that good health possible.

1. Modern medicine is primarily concerned with

- A.promotion of good health
- B.people suffering from imaginary illness
- C.people suffering from real illness
- D.increased efficiency in work

Answer: Option B

2. The passage suggests that

- A.health is an end in itself
- B.health is blessing
- C.health is only means to an end
- D.we should not talk about health

Answer: Option C

3. Talking about the health all time makes people

- A.always suffer from imaginary illness
- B.sometimes suffer from imaginary illness
- C.rarely suffer from imaginary illness
- D.often suffer from imaginary illness

Answer: Option D

4. The passage tells us

- A.how medicine should be manufactured
- B.what healthy man should or should not do
- C.what television programmes should be about
- D.how best to imagine illness

Answer: Option B

5. A healthy man should be concerned with

- A.his work which good health makes possible
- B.looking after his health
- C.his health which makes work possible
- D.talking about health

Answer: Option A

2. The object underlying the rules of natural justice "is to prevent miscarriage of justice" and secure "fair play in action". As pointed out earlier the requirement about recording of reasons for its decision by an administrative authority exercising quasi-judicial functions achieves his object by excluding changes of arbitrariness and ensuring a degree of fairness in the process of decision making. Keeping in view the expanding horizon of the principle of natural justice which govern exercise of power by administrative authorities. The rules of natural justice are not embodied rules. The extent of their application depends upon the particularly statutory framework where

under jurisdiction has been conferred on the administrative authority. with regard to the exercise of particular power by an administrative authority including exercise of judicial or quasi-judicial functions the legislature, while conferring the said power, may feel that it would not be in the larger public interest that the reasons for the order passed by the administrative authority be recorded in the order and be communicated to the aggrieved party and it may dispense with such a requirement.

1. "The rules of the natural justice are not embodies rules" means that these rules

- A.are left deliberately vague
- B.cannot be satisfactorily interpreted
- C.are flexible
- D.cannot be visualised

Answer: Option C

2. From the passage it is clear that it is the legislature that

- A invests the administrative authority with enormous powers
- B.embodies rules
- C.has the larger interests of public welfare
- D.leaves administrative authority enough discretion to interpret rules

Answer: Option A

3. According to the passage, there is always a gap between

- A.rules of natural justice and their application
- B.conception of a rule and its concretization
- C.demand for natural justice and its realization
- D.intention and execution

Answer: Option A

4. "To dispense with a requirement" means

- A.to do without the demand
- B.to drop the charge
- C.to cancel all formal procedure
- D.to alter the provisions of the case

Answer: Option A

5. According to the passage, natural justice can be brought about by

- A.administrative authority remaining vigilant
- B.administrative authority upholding rules of natural justice
- C.administrative authority farming rules suitably
- D.administrative authority observing the rules of fair play

Answer: Option D

3. It is to progress in the human sciences that we must look to undo the evils which have resulted from a knowledge of physical world hastily and superficially acquired by population unconscious of the changes in themselves that the new knowledge has imperative. The road to a happier world than any known in the past lies open before us if atavistic destructive passions can be kept in leash while the necessary adaptations are made. Fears are inevitable in time, but hopes are equally rational and far more likely to bear good fruit. We must learn to think rather less of the

dangers to be avoided than of the good that will lie within our grasp if we can believe in it and let it dominate our thoughts. Science, whatever unpleasant consequences it may have by the way, is in its very nature a liberator, a liberator of bondage to physical nature and in time to come, a liberator from the weight of destructive passions. We are on the threshold of utter disaster or unprecedently glorious achievement. No previous age has been fraught with problems so momentous; and it is to science that we must look to for a happy future.

1. What does science liberate us from? It is liberate us from

- A.fears and destructive passions
- B.slavery to physical nature and from passions
- C.bondage to physical nature
- D.idealistic hopes of glorious future

Answer: Option B

2. Should human sciences be developed because they will

- A.provide more knowledge of the physical world
- B.make us conscious of the changing world
- C.make us conscious of the changing in ourselves
- D.eliminate the destruction caused by a superficial knowledge of the physical world

Answer: Option D

3. If man's bestial yearning is controlled

- A.the future will be tolerable
- B.the future will be brighter than the present
- C.the present will be brighter than the future
- D.the present will become tolerable

Answer: Option B

4. Fears and hopes according to the author

- A.are closely linked with the life of modern man
- B.can bear fruit
- C.can yield good results
- D.are irrational

Answer: Option A

5. To carve out a bright future man should

- A.analyse dangers that lie ahead
- B.try to avoid dangers
- C.overcome fear and dangers
- D.cultivate a positive outlook

Answer: Option D

4. The strength of the electronics industry in Japan is the Japanese ability to organise production and marketing rather than their achievements in original research. The British are generally recognised as a far more inventive collection of individuals, but never seem able to exploit what they invent. There are many examples, from the TSR Z hovercraft, high speed train and Sinclair scooter to the Triumph, BSA and Norton Motorcycle which all prove this sad rule. The Japanese were able to exploit their strengths in marketing and development many years ago, and their success was at first either not understood in the West or was dismissed as something which could have been produced only at their low price. They were sold because they were cheap copies of

other people's ideas churned out of a workhouse which was dedicated to hard grind above all else.

- 1. It is evident from the passage that the strength of a country's industry depends upon
 - A.original research
 - B.international cooperation
 - C.dedicated workforce
 - D.electronic development

Answer: Option C

2. The sad rule mentioned in this passage refers to

- A.the inability of the Japanese to be inventive like the British
- B.the inability of the British to be industrious like the Japanese
- C.the lack of variety in Japanese inventions
- D.the poorer marketing ability of British

Answer: Option D

3. The TSR Z hovercraft, high speed train, Sinclair scooter etc. are the symbols of

- A.Japanese success
- B.British failure
- C.British success
- D.Japanese failure

Answer: Option B

4. According to the passage, prosperity in industry depends upon

- A.productivity
- B.inventiveness
- C.marketing ability
- D.official patronage

Answer: Option C

5. The main theme of this passage is

- A.electronic industry in Japan
- B.industrial comparison between Japan and Britain
- C.the role of marketing efficiency in industrial prosperity
- D.the importance of original research in industry

Answer: Option C

5. Courage is not only the basis of virtue; it is its expression. faith, hope, charity and all the rest don't become virtues until it takes courage to exercise them. There are roughly two types of courage. the first an emotional state which urges a man to risk injury or death, is physical courage. The second, more reasoning attitude which enables him to take coolly his career, happiness, his whole future or his judgement of what he thinks either right or worthwhile, is moral courage.

I have known many men, who had marked physical courage, but lacked moral courage. Some of them were in high places, but they failed to be great in themselves because they lacked moral courage. On the other hand I have seen men who undoubtedly possessed moral courage but were very cautious about taking physical risks. But I have never met a man with moral courage who couldn't, when it was really necessary, face a situation boldly.

1. A man of courage is

- A.cunning
- B.intelligent
- C.curious
- D.careful

Answer: Option D

2. Physical courage is an expression of

- A.emotions
C.uncertainty
B.deliberation
D.defiance

Answer: Option A

3. A man with moral courage can
A.defy his enemies
C.face a situation boldly
B.overcome all difficulties
D.be very pragmatic

- Answer:** Option C
4. People with physical courage ten lack
A.mental balance
C.emotional stability
B.capacity for reasoning
D.will to fight

- Answer:** Option B
5. All virtues become meaningful because of
A.faith
C.courage
B.charity
D.hope

Answer: Option C

- A. Egoist
C. Stoic
B.Fatalist
D. Cynic

- Answer: Option D
8. One who possesses many talents
A. Versatile
C. Exceptional

- B. Nubile
D. Gifted
Answer: Option A
9. Words inscribed on tomb
A. Epitome
C. Epilogue
B. Epistle
D. Epitaph

- Answer: Option D
10. One who eats everything
A. Omnivorous
C. Irrestible
B. Omniscent
D. Insolvent

- Answer: Option A
11. The custom or practice of having more than one husband at same time
A. Polygyny
C. Polyandry
B. Polyphony
D. Polychromy

- Answer: Option C
12. Tending to move away from the centre or axis
A. Centrifugal
C. Axiomatic
B. Centripetal
D.Awry
Answer: Option A

13. A person interested in collecting, studying and selling of old things
A. Antiquarian
C. Crank
B. Junk-dealer
D. Archealogist

- Answer: Option A
14. A drawing on transparent paper
A. Red print
C. Negative
B. Blue print
D. Transparency

- Answer: Option D
15. One who is not easily pleased by anything
A. Maiden
C. Precarious
B. Mediaeval
D.Fastidious

- Answer: Option D
16. A remedy for all diseases
A. Stoic
C. Panacea
B. Marvel
D. Recompense

- Answer: Option C
17. One who is fond of fighting
A. Bellicose
C. Belligerent
B. Aggressive
D. Militant

ONE WORD SUBSTITUTES

1. State in which the few govern the many
A. Monarchy
C. Plutocracy
B. Oligarchy
D. Autocracy

- Answer: Option B
2.A style in which a writer makes a display of his knowledge
A. Pedantic
C. Pompous
B. Verbose
D. Ornate

- Answer: Option A
3. List of the business or subjects to be considered at a meeting
A. Schedule
C. Agenda
B. Timetable
D. Plan

- Answer: Option C
4.Leave or remove from a place considered dangerous
A. Evade
C. Avoid
B. Evacuate
D. Exterminate

- Answer: Option B
5. A person pretending to be somebody he is not
A. Magician
C. Liar
B.Rogue
D. Imposter

- Answer: Option D
6. A person who knows many foreign languages
A. Linguist
C. Polyglot
B. Grammarian
D. Bilingual

- Answer: Option A
7. One who has little faith in human sincerity and goodness

VERBAL ANALOGIES

1. WAN:COLOUR
A. corpulent : weight
C. pallid: complexion

B insipid: flavour
D. enigmatic: puzzle

13. CORPOREAL:SPIRITUAL
A. mesa:plateau

C. foreigner:immigrant
Answer: Option B

D.pedagogue:teacher

14. SYMPHONY: COMPOSER

- A. Leonardo:music B. Fresco:painter
C. colours:pallet D. art:appreciation
Answer: Option B

SYLLOGISM

3) Statements: Some papers are pens. All the pencils are pens.
Conclusions:

1. Some pens are pencils.
2. Some pens are papers.
A. Only (1) conclusion follows B. Only (2) conclusion follows
C. Either (1) or (2) follows D. Neither (1) nor (2) follows
E. Both (1) and (2) follow
Answer: Option E

4) Statements: All the actors are girls. All the girls are beautiful.
Conclusions:

1. All the actors are beautiful.
2. Some girls are actors.
A. Only (1) conclusion follows B. Only (2) conclusion follows
C. Either (1) or (2) follows D. Neither (1) nor (2) follows
E. Both (1) and (2) follow
Answer: Option E

6) Statements: All the windows are doors. No door is a wall.
Conclusions:

1. Some windows are walls.
2. No wall is a door.
A. Only (1) conclusion follows B. Only (2) conclusion follows
C. Either (1) or (2) follows D. Neither (1) nor (2) follows
E. Both (1) and (2) follow
Answer: Option B

7) Statements: All cups are books. All books are shirts.
Conclusions:

1. Some cups are not shirts.
2. Some shirts are cups.
A. Only (1) conclusion follows B. Only (2) conclusion follows
C. Either (1) or (2) follows D. Neither (1) nor (2) follows

E. Both (1) and (2) follow
Answer: Option B

8) Statements: Some cows are crows. Some crows are elephants.

- Conclusions:
1. Some cows are elephants.
2. All crows are elephants.
A. Only (1) conclusion follows B. Only (2) conclusion follows
C. Either (1) or (2) follows D. Neither (1) nor (2) follows
E. Both (1) and (2) follow
Answer: Option D

9) Statements: All the pencils are pens. All the pens are inks.

- Conclusions:
1. All the pencils are inks.
2. Some inks are pencils.
A. Only (1) conclusion follows B. Only (2) conclusion follows
C. Either (1) or (2) follows D. Neither (1) nor (2) follows
E. Both (1) and (2) follow
Answer: Option E

10) Statements: Some dogs are bats. Some bats are cats.

- Conclusions:
1. Some dogs are cats.
2. Some cats are dogs.
A. Only (1) conclusion follows B. Only (2) conclusion follows
C. Either (1) or (2) follows D. Neither (1) nor (2) follows
E. Both (1) and (2) follow
Answer: Option

11) Statements: All the trucks are flies. Some scooters are flies.

- Conclusions:
1. All the trucks are scooters.
2. Some scooters are trucks.
A. Only (1) conclusion follows B. Only (2) conclusion follows
C. Either (1) or (2) follows D. Neither (1) nor (2) follows
E. Both (1) and (2) follow
Answer: Option D

12) Statements: All buildings are chalks. No chalk is toffee.

- Conclusions:
1. No building is toffee

2. All chalks are buildings.
 A. Only (1) conclusion follows B. Only (2) conclusion follows
 C. Either (1) or (2) follows D. Neither (1) nor (2) follows
 E. Both (1) and (2) follow
 Answer: Option A
- 13) Statements: All cars are cats. All fans are cats.
 Conclusions:
 1. All cars are fans.
 2. Some fans are cars.
 A. Only (1) conclusion follows B. Only (2) conclusion follows
 C. Either (1) or (2) follows D. Neither (1) nor (2) follows
 E. Both (1) and (2) follow
 Answer: Option D
- 14) Statements: No door is dog. All the dogs are cats.
 Conclusions:
 1. No door is cat.
 2. No cat is door.
 3. Some cats are dogs.
 4. All the cats are dogs.
 A. Only (2) and (4) B. Only (1) and (3)
 C. Only (3) and (4) D. Only (3)
 E. All the four
 Answer: Option D
- 15) Statements: All green are blue. All blue are white.
 Conclusions:
 1. Some blue are green.
 2. Some white are green.
 3. Some green are not white.
 4. All white are blue.
 A. Only (1) and (2) B. Only (1) and (3)
 C. Only (1) and (4) D. Only (2) and (4)
 Answer: Option A
- 16) Statements: All men are vertebrates. Some mammals are vertebrates.
 Conclusions:
 1. All men are mammals.
 2. All mammals are men.
 3. Some vertebrates are mammals.
 4. All vertebrates are men.
 A. Only (4) B. Only (2)
 C. Only (3) D. Only (1)
- 17) Statements: All the phones are scales. All the scales are calculators.
 Conclusions:
 1. All the calculators are scales.
 2. All the phones are calculators
 3. All the scales are phones.
 4. Some calculators are phones.
 A. Only (1) and (4) B. Only (3) and (4)
 C. Only (2) and (4) D. Only (1) and (2)
 E. Only (1) and (3)
 Answer: Option C
- 18) Statements: Some cars are scooters. No scooter is cycle.
 Conclusions:
 1. No car is cycle.
 2. No scooter is car.
 3. Some cars are cycles.
 4. Some scooters are cars.
 A. None of the four. B. All the four.
 C. Only (1) and (4) D. Only (4)
 E. Only (2) and (4)
 Answer: Option D
- 19) Statements: All the locks are keys. All the keys are bats. Some watches are bats.
 Conclusions:
 1. Some bats are locks.
 2. Some watches are keys.
 3. All the keys are locks.
 A. Only (1) and (2) B. Only (1)
 C. Only (2) D. Only (1) and (3)
 Answer: Option B
- 20) Statements: Some keys are staplers. Some staplers are stickers. All the stickers are pens.
 Conclusions:
 1. Some pens are staplers.
 2. Some stickers are keys.
 3. No sticker is key.
 4. Some staplers are keys.
 A. Only (1) and (2) B. Only (2) and (4)
 C. Only (2) and (3) D. Only (1) and (4) and either (2) or (3)
 Answer: Option D

- 21) Statements: Some questions are answers. Some answers are writers. All the writers are poets.
 Conclusions:
 1. Some writers are answers.
 2. Some poets are questions.
 3. All the questions are poets.
 4. Some poets are answers.
 A. Only (1) and (2) B. Only (1) and (4)
 C. Only (1) and (3) D. Only (2) and (4)
 Answer: Option B
- 22) Statements: Some envelopes are gums. Some gums are seals. Some seals are adhesives.
 Conclusions:
 1. Some envelopes are seals.
 2. Some gums are adhesives.
 3. Some adhesives are seals.
 4. Some adhesives are gums.
 A. Only (3) B. Only (1)
 C. Only (2) D. Only (4)
 Answer: Option A
- 23) Statements: All the papers are books. All the bags are books. Some purses are bags.
 Conclusions:
 1. Some papers are bags.
 2. Some books are papers.
 3. Some books are purses.
 A. Only (1)
 B. Only (2) and (3)
 C. Only (1) and (2)
 D. Only (1) and (3)
 Answer: Option B
- 24) Statements: Some rats are cats. Some cats are dogs. No dog is cow.
 Conclusions:
 1. No cow is cat.
 2. No dog is rat.
 3. Some cats are rats.
 A. Only (1) B. Only (1) and (2)
 C. Only (1) and (3) D. Only (2) and (3)
 E. Only (3)
 Answer: Option E
- 25) Statements: All the books are papers. Some papers are journals. Some journals are
 calendars.
 Conclusions:
 1. Some journals are books.
 2. Some calendars are papers.
 3. Some books are journals.
 4. Some books are calendars.
 A. Only (1) B. Only (2)
 C. Only (3) D. Only (4)
 E. None of the four
 Answer: Option E
- 26) Statements: All the bottles are boxes. All the boxes are bags. Some bags are trays.
 Conclusions:
 1. Some bottles are trays.
 2. Some trays are boxes.
 3. All the bottles are bags.
 4. Some trays are bags.
 A. Only (3) and (4) B. Only (1) and (2)
 C. Only (2) and (3) D. Only (1) and (4)
 Answer: Option A
- 27) Statements: Some cars are jeeps. All the boxes are jeeps. All the pens are cars.
 Conclusions:
 1. Some cars are boxes.
 2. No pen is jeep.
 3. Some boxes are cars.
 A. None of three B. Only (1) and (2)
 C. Only (1) and (3) D. Only (2) and (3)
 Answer: Option A
- 28) Statements: Some tables are T.V. Some T.V. are radios.
 Conclusions:
 1. Some tables are radios.
 2. Some radios are tables.
 3. All the radios are T.V.
 4. All the T.V. are tables.
 A. Only (2) and (4) B. Only (1) and (3)
 C. Only (4) D. Only (1) and (4)
 E. None of the four.
 Answer: Option E
- 29) Statements: Some pens are books. Some books are pencils.
 Conclusions:

1. Some pens are pencils.
 2. Some pencils are pens.
 3. All pencils are pens.
 4. All books are pens.
- A. Only (1) and (3) B. Only (2) and (4)
 C. All the four D. None of the four
 E. Only (1)
- Answer: Option D
- All except Ayurveda are names of holy scriptures, the four Vedas. Ayurveda is a branch of medicine.
4. Choose the word which is different from the rest.
- A. Curd B. Butter
 C. Oil D. Cheese
 E. Cream
- Answer: Option C
- Explanation:
- All except Oil are products obtained from milk.
- 30) Statements: All the goats are tigers. All the tigers are lions.
- Conclusions:
1. All the goats are lions.
 2. All the lions are goats.
 3. Some lions are goats.
 4. Some tigers are goats.
- A. All the four B. Only (1), (2) and (3)
 C. Only (1), (3) and (4) D. Only (2), (3) and (4)
- Answer: Option C
5. Choose the word which is different from the rest.
- A. Pear B. Apple
 C. Litchi D. Guava
 E. Orange
- Answer: Option E
- Explanation:
- Orange is the only citrus fruit in the group.
6. Choose the word which is different from the rest.
- A. Dagger B. Hammer
 C. Knife D. Sword
 E. Blade
- Answer: Option B
- Explanation:
- All except Hammer are sharp-edged and have a cutting action.

CLASSIFICATION

1. Choose the word which is different from the rest.
- A. Cap B. Turban
 C. Helmet D. Veil
 E. Hat
- Answer: Option D
- Explanation:
- All except Veil cover the head, while veil covers the face.
2. Choose the word which is different from the rest.
- A. Kiwi B. Eagle
 C. Emu D. Ostrich
- Answer: Option B
3. Choose the word which is different from the rest.
- A. Rigveda B. Yajurveda
 C. Atharvaveda D. Ayurveda
 E. Samveda
- Answer: Option D
- Explanation:
4. Choose the word which is different from the rest.
- A. Producer B. Director
 C. Investor D. Financier
 E. Entrepreneur
- Answer: Option B
- Explanation:
- All except Director spend money.

Answer: Option A

Explanation:

In all other pairs, second is the name of the metal of which the first is an ore. On the other hand, Solder is an alloy.

22. Choose the pair in which the words are differently related from the rest.

A. Donald : Comedy B. Holmes : Suspense
C. Premchand : Novel D. Robinson : Adventure

Answer: Option C

Explanation:

In all other pairs, first is a character of the type of movie denoted by the second.

23. Choose the pair in which the words are differently related from the rest.

A. Onomatology : Names B. Nidology : Nests
C. Phycology : Algae D. Concology : Shells

Answer: Option D

Explanation:

In all other pairs, first is the study of second.

24. Choose the pair in which the words are differently related from the rest.

A. Cow : Fodder B. Crow : Carrion
C. Poultry : Farm D. Vulture : Prey

Answer: Option C

Explanation:

In all other pairs, second is the food over which the first feeds.

25. Choose the pair in which the words are differently related from the rest.

A. Fish : Pisciculture B. Birds : Horticulture
C. Bees : Apiculture D. Silkworm : Sericulture

Answer: Option B

Explanation:

In all other pairs, second is the name given to artificial rearing of the first.

26. Choose the pair in which the words are differently related from the rest.

A. Aphid : Paper B. Moth : Wool
C. Termite : Wood D. Locust: Plant

Answer: Option A

Explanation:

In all other pairs, first is the insect which damages the second.

27. Which word does NOT belong with the others?

A. inch B. ounce
C. centimeter D. yard

Answer: Option B

28. Which word does NOT belong with the others?

[A]. tulip [B]. rose
[C]. bud [D]. daisy

Answer: Option C

29. Which word does NOT belong with the others?

A. rye B. sourdough
C. pumpernickel D. loaf

Answer: Option A

Explanation:

Loaf, sourdough, and pumpernickel are types of bread. A rye is not a bread type.

Loaf - Bread that is shaped and baked in one piece and usually sliced before being eaten.

Pumpernickel - Dark, dense German bread made from coarsely ground whole-grain

rye.

left

Sourdough - Leaven for making bread, consisting of fermenting dough, typically that

over from a previous batch.

Rye - A wheatlike cereal plant that tolerates poor soils and low temperatures.

30. Which word does NOT belong with the others?

A. dodge B. flee
C. duck D. avoid

Answer: Option B

31. Which word does NOT belong with the others?

A. tape B. twine
C. cord D. yarn

Answer: Option A

32. Which word does NOT belong with the others?

A. leopard B. cougar
C. elephant D. lion

Answer: Option C

33. Which word does NOT belong with the others?

A. couch B. rug
C. table D. chair

Answer: Option B

Explanation:

The couch, table, and chair are pieces of furniture; the rug is not.

34. Which word does NOT belong with the others?
 A. cornea B. retina
 C. pupil D. vision
 Answer: Option D
 Explanation:
 The cornea, retina, and pupil are all parts of the eye.
35. Which word does NOT belong with the others?
 A. noun B. preposition
 C. punctuation D. adverb
 Answer: Option C
 Explanation:
 The noun, preposition, and adverb are classes of words that make up a sentence.
 Punctuation belongs in a sentence, but punctuation is not a class of word.
36. Which word does NOT belong with the others?
 A. peninsula B. island
 C. bay D. cape
 Answer: Option C
 Explanation:
 A peninsula, island, and cape are all landforms; a bay is a body of water.
37. Which word does NOT belong with the others?
 A. fair B. just
 C. equitable D. favorable
 Answer: Option D
 Explanation:
 Fair, just, and equitable are all synonyms meaning impartial. Favorable means expressing approval.
38. Which word does NOT belong with the others?
 A. acute B. right
 C. obtuse D. parallel
 Answer: Option D
 Explanation:
 Acute, right, and obtuse are geometric terms describing particular angles. Parallel refers to two lines that never intersect.
39. Which word does NOT belong with the others?
 A. scythe B. knife
 C. pliers D. saw
- for
 Answer: Option C
 Explanation:
 The scythe, knife, and saw are all cutting tools. Pliers are tools, but they are not used for cutting.
40. Which word does NOT belong with the others?
 A. evaluate B. assess
 C. appraise D. instruct
 Answer: Option D
 Explanation:
 Evaluate, assess, and appraise are all synonyms; instruct does not mean the same thing.

LOGICAL SEQUENCE

- 1) Arrange the words given below in a meaningful sequence.
 1. Key 2. Door 3. Lock
 4. Room 5. Switch on
 A. 5, 1, 2, 4, 3 B. 4, 2, 1, 5, 3
 C. 1, 3, 2, 4, 5 D. 1, 2, 3, 5, 4
 Answer: Option C
- 2) Arrange the words given below in a meaningful sequence.
 1. Word 2. Paragraph 3. Sentence
 4. Letters 5. Phrase
 A. 4, 1, 5, 2, 3 B. 4, 1, 3, 5, 2
 C. 4, 2, 5, 1, 3 D. 4, 1, 5, 3, 2
 Answer: Option D
- 3) Arrange the words given below in a meaningful sequence.
 1. Police 2. Punishment 3. Crime
 4. Judge 5. Judgement
 A. 3, 1, 2, 4, 5 B. 1, 2, 4, 3, 5
 C. 5, 4, 3, 2, 1 D. 3, 1, 4, 5, 2
 Answer: Option D
- 4) Arrange the words given below in a meaningful sequence.
 1. Family 2. Community 3. Member
 4. Locality 5. Country
 A. 3, 1, 2, 4, 5 B. 3, 1, 2, 5, 4
 C. 3, 1, 4, 2, 5 D. 3, 1, 4, 5, 2
 Answer: Option A
- 5) Arrange the words given below in a meaningful sequence.

1. Poverty 2. Population 3. Death Answer: Option C
4. Unemployment 5. Disease
- A. 2, 3, 4, 5, 1 B. 3, 4, 2, 5, 1
C. 2, 4, 1, 5, 3 D. 1, 2, 3, 4, 5
- Answer: Option C
- 6) Arrange the words given below in a meaningful sequence.
1. Never 2. Sometimes 3. Generally
4. Seldom 5. Always
- A. 5, 2, 1, 3, 4 B. 5, 2, 4, 3, 1
C. 5, 3, 2, 1, 4 D. 5, 3, 2, 4, 1
- Answer: Option D
- 11) Arrange the words given below in a meaningful sequence.
1. Index 2. Contents 3. Title 4. Chapters 5. Introduction
- A. 2, 3, 4, 5, 1 B. 3, 2, 5, 1, 4
C. 3, 2, 5, 4, 1 D. 5, 1, 4, 2, 3
- Answer: Option C
- 12) Arrange the words given below in a meaningful sequence.
1. Income 2. Status 3. Education
4. Well-being 5. Job
- A. 1, 2, 5, 3, 4 B. 1, 3, 2, 5, 4
C. 3, 1, 5, 2, 4 D. 3, 5, 1, 2, 4
- Answer: Option D
- 7) Arrange the words given below in a meaningful sequence.
1. Windows 2. Walls 3. Floor
4. Foundation 5. Roof 6. Room
- A. 4, 1, 5, 6, 2, 3 B. 4, 2, 1, 5, 3, 6
C. 4, 3, 5, 6, 2, 1 D. 4, 5, 3, 2, 1, 6
- Answer: Option B
- 13) Arrange the words given below in a meaningful sequence.
1. Table 2. Tree 3. Wood
4. Seed 5. Plant
- A. 1, 2, 3, 4, 5 B. 1, 3, 2, 4, 5
C. 4, 5, 2, 3, 1 D. 4, 5, 3, 2, 1
- Answer: Option C
- 8) Arrange the words given below in a meaningful sequence.
1. Cut 2. Put on 3. Mark
4. Measure 5. Tailor
- A. 1, 3, 2, 4, 5 B. 2, 4, 3, 1, 5
C. 3, 1, 5, 4, 2 D. 4, 3, 1, 5, 2
- Answer: Option D
- 14) Arrange the words given below in a meaningful sequence.
1. Table 2. Tree 3. Wood
4. Seed 5. Plant
- A. 1, 2, 3, 4, 5 B. 1, 3, 2, 4, 5
C. 4, 5, 2, 3, 1 D. 4, 5, 3, 2, 1
- Answer: Option C
- 9) Arrange the words given below in a meaningful sequence.
1. House 2. Street 3. Room
4. Town 5. District
- A. 3, 2, 1, 4, 5 B. 3, 1, 4, 2, 5
C. 3, 1, 2, 4, 5 D. 3, 1, 2, 5, 4
- Answer: Option C
- 15) Arrange the words given below in a meaningful sequence.
1. Windows 2. Walls 3. Floor
4. Foundation 5. Roof 6. Room
- A. 4, 1, 5, 6, 2, 3 B. 4, 2, 1, 5, 3, 6
C. 4, 3, 5, 6, 2, 1 D. 4, 5, 3, 2, 1, 6
- Answer: Option C
- 10) Arrange the words given below in a meaningful sequence.
1. Probation 2. Interview 3. Selection
4. Appointment 5. Advertisement 6. Application
- A. 5, 6, 3, 2, 4, 1 B. 5, 6, 4, 2, 3, 1
C. 5, 6, 2, 3, 4, 1 D. 6, 5, 4, 2, 3, 1
- 16) Arrange the words given below in a meaningful sequence.
1. Presentation 2. Recommendation 3. Arrival
4. Discussion 5. Introduction

- A. 3, 5, 1, 4, 2
C. 5, 3, 1, 2, 4

Answer: Option A

- B. 3, 5, 4, 2, 1
D. 5, 3, 4, 1, 2

17) Arrange the words given below in a meaningful sequence.

1. Butterfly 2. Cocoon 3. Egg 4. Worm
A. 1, 3, 4, 2 B. 1, 4, 3, 2
C. 2, 4, 1, 3 D. 3, 4, 2, 1

Answer: Option D

18) Arrange the words given below in a meaningful sequence.

1. Rain 2. Monsoon 3. Rescue
4. Flood 5. Shelter 6. Relief
A. 1, 2, 3, 4, 5, 6 B. 1, 2, 4, 5, 3, 6
C. 2, 1, 4, 3, 5, 6 D. 4, 1, 2, 3, 5, 6

Answer: Option C

19) Arrange the words given below in a meaningful sequence.

1. Milky way 2. Sun 3. Moon
4. Earth 5. Stars
A. 1, 4, 3, 2, 5 B. 2, 3, 4, 5, 1
C. 3, 4, 2, 5, 1 D. 4, 3, 2, 5, 1

Answer: Option C

20) Arrange the words given below in a meaningful sequence.

1. Foetus 2. Child 3. Baby 4. Adult 5. Youth
A. 1, 2, 4, 3, 5 B. 1, 3, 2, 5, 4
C. 2, 3, 5, 4, 1 D. 5, 4, 2, 3, 1

Answer: Option B

21) Arrange the words given below in a meaningful sequence.

1. Sea 2. Rivulet 3. Ocean
4. River 5. Glacier
A. 5, 2, 1, 3, 4 B. 5, 2, 4, 1, 3
C. 5, 4, 2, 3, 1 D. 5, 4, 3, 2, 1

Answer: Option B

22) Arrange the words given below in a meaningful sequence.

1. Doctor 2. Fever 3. Prescribe
4. Diagnose 5. Medicine
A. 1, 4, 3, 2, 5 B. 2, 1, 3, 4, 5
C. 2, 1, 4, 3, 5 D. 2, 4, 3, 5, 1

Answer: Option C

23) Arrange the words given below in a meaningful sequence.

1. Reading 2. Composing 3. Writing
4. Printing
A. 1, 3, 2, B. 2, 3, 4, 1
C. 3, 1, 2, 4 D. 3, 2, 4, 1

Answer: Option D

24) Arrange the words given below in a meaningful sequence.

1. Hecto 2. Centi 3. Deca 4. Kilo 5. Deci
A. 1, 3, 4, 5, 2 B. 1, 5, 3, 4, 2
C. 2, 5, 3, 1, 4 D. 5, 2, 1, 4, 3

Answer: Option C

25) Arrange the words given below in a meaningful sequence.

1. Honey 2. Flower 3. Bee 4. Wax
A. 1, 3, 4, 2 B. 2, 1, 4, 3
C. 2, 3, 1, 4 D. 4, 3, 2, 1

Answer: Option C

26) Arrange the words given below in a meaningful sequence.

1. Country 2. Furniture 3. Forest
4. Wood 5. Trees
A. 1, 3, 5, 4, 2 B. 1, 4, 3, 2, 5
C. 2, 4, 3, 1, 5 D. 5, 2, 3, 1, 4

Answer: Option A

27) Arrange the words given below in a meaningful sequence.

1. Site 2. Plan 3. Rent
4. Money 5. Building 6. Construction
A. 1, 2, 3, 6, 5, 4 B. 2, 3, 6, 5, 1, 4
C. 3, 4, 2, 6, 5, 1 D. 4, 1, 2, 6, 5, 3

Answer: Option D

28) Arrange the words given below in a meaningful sequence.

- | | | | | |
|------------------|------------------|---------|---------|--------------|
| 1. Key | 2. Door | 3. Lock | 4. Room | 5. Switch on |
| A. 1, 2, 3, 5, 4 | B. 1, 3, 2, 4, 5 | | | |
| C. 4, 2, 1, 5, 3 | D. 5, 1, 2, 4, 3 | | | |

Answer: Option B

29) Arrange the words given below in a meaningful sequence.

- | | | | | |
|------------------|------------------|--------|----------|----------|
| 1. Rainbow | 2. Rain | 3. Sun | 4. Happy | 5. Child |
| A. 2, 1, 4, 3, 5 | B. 2, 3, 1, 5, 4 | | | |
| C. 4, 2, 3, 5, 1 | D. 4, 5, 1, 2, 3 | | | |

Answer: Option B

30) Arrange the words given below in a meaningful sequence.

- | | | | | |
|------------------|------------------|--------------|-----------|------------|
| 1. Cutting | 2. Dish | 3. Vegetable | 4. Market | 5. Cooking |
| A. 1, 2, 4, 5, 3 | B. 3, 2, 5, 1, 4 | | | |
| C. 4, 3, 1, 5, 2 | D. 5, 3, 2, 1, 4 | | | |

Answer: Option C

31) Arrange the words given below in a meaningful sequence.

- | | | | | |
|------------------|------------------|-------------|----------|----------|
| 1. Elephant | 2. Cat | 3. Mosquito | 4. Tiger | 5. Whale |
| A. 1, 3, 5, 4, 2 | B. 2, 5, 1, 4, 3 | | | |
| C. 3, 2, 4, 1, 5 | D. 5, 3, 1, 2, 4 | | | |

Answer: Option C

32) Arrange the words given below in a meaningful sequence.

- | | | | | |
|------------------|------------------|---------|------------|-----------|
| 1. Cut | 2. Put on | 3. Mark | 4. Measure | 5. Tailor |
| A. 1, 3, 2, 4, 5 | B. 2, 4, 3, 1, 5 | | | |
| C. 3, 1, 5, 4, 2 | D. 4, 3, 1, 5, 2 | | | |

Answer: Option D

33) Arrange the words given below in a meaningful sequence.

- | | | | | |
|------------------|------------------|----------|-----------|----------|
| 1. Yarn | 2. Plant | 3. Saree | 4. Cotton | 5. Cloth |
| A. 2, 4, 1, 5, 3 | B. 2, 4, 3, 5, 1 | | | |
| C. 2, 4, 5, 1, 3 | D. 2, 4, 5, 3, 1 | | | |

Answer: Option A

34) Arrange the words given below in a meaningful sequence.

- | | | | | |
|------------------|------------------|----------|------------|--------------|
| 1. Police | 2. Punishment | 3. Crime | 4. Justice | 5. Judgement |
| A. 1, 2, 3, 4, 5 | B. 3, 1, 2, 4, 5 | | | |

- | | |
|------------------|------------------|
| C. 3, 1, 4, 5, 2 | D. 5, 4, 3, 2, 1 |
|------------------|------------------|

Answer: Option C

35) Arrange the words given below in a meaningful sequence.

- | | | | | |
|------------------|------------------|---------|-----------|--------------|
| 1. Patient | 2. Diagnosis | 3. Bill | 4. Doctor | 5. Treatment |
| A. 1, 4, 2, 3, 5 | B. 1, 4, 3, 2, 5 | | | |
| C. 1, 4, 2, 5, 3 | D. 4, 1, 2, 3, 5 | | | |

Answer: Option C

36) Arrange the words given below in a meaningful sequence.

- | | | | |
|---------------|-----------------|--------------|--------------|
| 1. Atomic Age | 2. Metallic Age | 3. Stone Age | 4. Alloy Age |
| A. 1, 3, 4, 2 | B. 2, 3, 1, 4 | | |
| C. 3, 2, 4, 1 | D. 4, 3, 2, 1 | | |

Answer: Option C

VERBAL REASONING

Erin is twelve years old. For three years, she has been asking her parents for a dog. Her parents have told her that they believe a dog would not be happy in an apartment, but they have given her permission to have a bird. Erin has not yet decided what kind of bird she would like to have.

- A. Erin's parents like birds better than they like dogs.
- B. Erin does not like birds.
- C. Erin and her parents live in an apartment.
- D. Erin and her parents would like to move.

Answer: Option C

Explanation:

Since Erin's parents think a dog would not be happy in an apartment, we can reasonably conclude that the family lives in an apartment. We do not know if Erin's parents dislike dogs (choice a) or if Erin dislikes birds (choice b). There is no support for choice d.

2) Last summer, Mike spent two weeks at a summer camp. There, he went hiking, swimming, and canoeing. This summer, Mike looks forward to attending a two-week music camp, where he hopes to sing, dance, and learn to play the guitar.

- A. Mike's parents want him to learn to play the guitar.
- B. Mike prefers music to outdoor activities.
- C. Mike goes to some type of camp every summer.
- D. Mike likes to sing and dance.

Answer: Option D

Explanation:

It is reasonable to conclude that Mike likes singing and dancing because he looks forward to doing these things at music camp. There is no information that supports any

of the other three choices.

- 3) Seahorse populations have declined everywhere that seahorses are fished. During the past five years, seahorse populations have decreased by 50%. Last year, biologists met to discuss what might be done to reverse this trend.

- A. Seahorses are likely to become extinct within five years.
- B. One way to increase seahorse populations is to ban the fishing of seahorses.
- C. Biologists from all over the world are working to save the seahorses.
- D. Seahorse fishermen have spoken out against the biologists.

Answer: Option B

Explanation:

Since the seahorse populations have declined as a result of fishing, their populations will increase if seahorse fishing is banned. There is no support for any of the other choices.

- 4) On weekends, Mr. Sanchez spends many hours working in his vegetable and flower gardens. Mrs. Sanchez spends her free time reading and listening to classical music. Both Mr. Sanchez and Mrs. Sanchez like to cook.

- A. Mr. Sanchez enjoys planting and growing vegetables.
- B. Mr. Sanchez does not like classical music.
- C. Mrs. Sanchez cooks the vegetables that Mr. Sanchez grows.
- D. Mrs. Sanchez enjoys reading nineteenth century novels.

Answer: Option A

Explanation:

Because Mr. Sanchez spends many hours during the weekend working in his vegetable garden, it is reasonable to suggest that he enjoys this work. There is no information to suggest that he does not like classical music. Although Mrs. Sanchez likes to cook, there is nothing that indicates she cooks vegetables (choice c). Mrs. Sanchez likes to read, but there is no information regarding the types of books she reads (choice d).

- 5) Georgia is older than her cousin Marsha. Marsha's brother Bart is older than Georgia. When Marsha and Bart are visiting with Georgia, all three like to play a game of Monopoly. Marsha wins more often than Georgia does.

- A. When he plays Monopoly with Marsha and Georgia, Bart often loses.
- B. Of the three, Georgia is the oldest.
- C. Georgia hates to lose at Monopoly.
- D. Of the three, Marsha is the youngest.

Answer: Option D

Explanation:

If Georgia is older than Marsha and Bart is older than Georgia, then Marsha has to be the youngest of the three. Choice b is clearly wrong because Bart is the oldest. There is no information in the paragraph to support either choice a or choice c.

6)

Sara lives in a large city on the East Coast. Her younger cousin Marlee lives in the Midwest in a small town with fewer than 1,000 residents. Marlee has visited Sara several times during the past five years. In the same period of time, Sara has visited Marlee only once.

- A. Marlee likes Sara better than Sara likes Marlee.
- B. Sara thinks small towns are boring.
- C. Sara is older than Marlee.
- D. Marlee wants to move to the East Coast.

Answer: Option C

Explanation:

Since the paragraph states that Marlee is the younger cousin, Sara must be older than Marlee. There is no information to support the other choices.

7)

Ten new television shows appeared during the month of September. Five of the shows were sitcoms, three were hour-long dramas, and two were news-magazine shows. By January, only seven of these new shows were still on the air. Five of the shows that remained were sitcoms.

- A. Only one of the news-magazine shows remained on the air.
- B. Only one of the hour-long dramas remained on the air.
- C. At least one of the shows that was cancelled was an hour-long drama.
- D. Television viewers prefer sitcoms over hour-long dramas.

Answer: Option C

Explanation:

If there were seven shows left and five were sitcoms, this means that only two of the shows could possibly be dramas. Choices a and b may be true, but there is no evidence to indicate this as fact. The fact that all of the sitcoms remained does not necessarily mean that viewers prefer sitcoms (choice d).

8)

Tim's commute never bothered him because there were always seats available on the train and he was able to spend his 40 minutes comfortably reading the newspaper or catching up on paperwork. Ever since the train schedule changed, the train has been extremely crowded, and by the time the doors open at his station, there isn't a seat to be found.

- A. Tim would be better off taking the bus to work.
- B. Tim's commute is less comfortable since the train schedule changed.

- C. Many commuters will complain about the new train schedule.
D. Tim will likely look for a new job closer to home.

Answer: Option B

Explanation:

The passage tells us that Tim's commute didn't bother him because he was always able to sit down and comfortably read or do paperwork. Therefore, it is reasonable to assume that Tim's commute has become less comfortable since the schedule change, because it is very crowded and he can no longer find a seat. There is no information given that supports choices a, c, and d.

- 2) One of the warmest winters on record has put consumers in the mood to spend money. Spending is likely to be the strongest in thirteen years. During the month of February, sales of existing single-family homes hit an annual record rate of 4.75 million. This paragraph best supports the statement that
A. consumer spending will be higher thirteen years from now than it is today.
B. more people buy houses in the month of February than in any other month.
C. during the winter months, the prices of single-family homes are the lowest.
D. there were about 4 million homes for sale during the month of February.
E. warm winter weather is likely to affect the rate of home sales.

Answer: Option E

Explanation:

This is clearly the best answer because the paragraph directly states that warm weather affects consumers inclination to spend. It furthers states that the sales of single-family homes was at an all-time high. There is no support for choice a or c. Choice b is wrong because even though there were high sales for a particular February, this does not mean that sales are not higher in other months. Choice d presents a misleading figure of 4 million. The paragraph states that the record of 4.75 million was at an annual, not a monthly, rate.

ANALYSING ARGUMENTS

1)

One New York publisher has estimated that 50,000 to 60,000 people in the United States want an anthology that includes the complete works of William Shakespeare. And what accounts for this renewed interest in Shakespeare? As scholars point out, his psychological insights into both male and female characters are amazing even today.

This paragraph best supports the statement that

- A. Shakespeare's characters are more interesting than fictional characters today.
B. people even today are interested in Shakespeare's work because of the characters.
C. academic scholars are putting together an anthology of Shakespeare's work.
D. New Yorkers have a renewed interest in the work of Shakespeare.
E. Shakespeare was a psychiatrist as well as a playwright.

Answer: Option B

Explanation:

The last sentence in the paragraph clearly gives support for the idea that the interest in Shakespeare is due to the development of his characters. Choice a is incorrect because the writer never makes this type of comparison. Choice c is wrong because even though scholars are mentioned in the paragraph, there is no indication that the scholars are compiling the anthology. Choice d is wrong because there is no support to show that most New Yorkers are interested in this work. There is no support for choice e either.

3)

Yoga has become a very popular type of exercise, but it may not be for everyone. Before you sign yourself up for a yoga class, you need to examine what it is you want from your fitness routine. If you're looking for a high-energy, fast-paced aerobic workout, a yoga class might not be your best choice.

This paragraph best supports the statement that

- A. yoga is more popular than high-impact aerobics.
B. before embarking on a new exercise regimen, you should think about your

needs

and desires.

- C. yoga is changing the world of fitness in major ways
D. yoga benefits your body and mind
E. most people think that yoga isn't a rigorous form of exercise.

Answer: Option B

Explanation:

The second sentence points out that people should examine what they want from a fitness routine before signing up for a new exercise class. There is no evidence to support choice a. Choice c might sound reasonable due to the fact that the paragraph tells us that yoga has become very popular, but this statement is not supported by the

information provided in the paragraph. Choices d and e are also not supported since the paragraph doesn't tell us whether yoga is good for both body and mind or what people think about it.

- 4) Human technology developed from the first stone tools about two and a half million years ago. At the beginning, the rate of development was slow. Hundreds of thousands of years passed without much change. Today, new technologies are reported daily on television and in newspapers.

This paragraph best supports the statement that

- A. stone tools were not really technology.
- B. stone tools were in use for two and a half million years
- C. there is no way to know when stone tools first came into use.
- D. In today's world, new technologies are constantly being developed
- E. none of the latest technologies is as significant as the development of stone tools.

Answer: Option D

Explanation:

The last sentence states that new technologies are reported daily, and this implies that new technologies are being constantly developed. There is no support for choice a. With regard to choice b, stone tools were first used two and a half million years ago, but they were not necessarily in use all that time. Choice c is clearly wrong since the paragraph states when stone tools first came into use. Although some may agree that choice e is true, the author of the paragraph does not give support for this opinion.

- 5) Mathematics allows us to expand our consciousness. Mathematics tells us about economic trends, patterns of disease, and the growth of populations. Math is good at exposing the truth, but it can also perpetuate misunderstandings and untruths. Figures have the power to mislead people.

This paragraph best supports the statement that

- A. the study of mathematics is dangerous.
- B. words are more truthful than figures.
- C. the study of mathematics is more important than other disciplines.
- D. the power of numbers is that they cannot lie.
- E. figures are sometimes used to deceive people.

Answer: Option E

Explanation:

This answer is clearly stated in the last sentence of the paragraph. Choice a can be ruled out because there is no support to show that studying math is dangerous. Words are not mentioned in the passage, which rules out choice b. Choice d is a contradiction to the information in the passage. There is no support for choice c.

- 6) Some groups want to outlaw burning the flag. They say that people have fought and died for the flag and that citizens of the United States ought to respect that. But I say that respect cannot be leg-islated. Also, most citizens who have served in the military

did not fight for the flag, they fought for what the flag represents. Among the things the flag represents is freedom of speech, which includes, I believe, the right for a citizen to express displeasure with the government by burning the flag in protest.

1. Which of the following is similar to the argument made by the speaker?
- A. The rich should not be allowed to "buy" politicians, so the Congress should enact campaign finance reform.
 - B. The idea of freedom of religion also means the right not to participate in religion, so mandated school prayer violates freedom of religion.
 - C. The Constitution guarantees freedom to own property, so taxes should be illegal.
 - D. Convicted felons should not have their convictions overturned on a technicality.
 - E. In order to understand what may be constitutional today, one needs to look at what the laws were when the Constitution was enacted.

Answer: Option B

Explanation:

This is the best choice because it relates to a situation where a proposed law would actually violate the part of the Constitution it is intended to protect.

2. Which of the following, if true, would weaken the speaker's argument?
- A. An action is not considered a part of freedom of speech.
 - B. People who burn the flag usually commit other crimes as well.
 - C. The flag was not recognized by the government until 1812.
 - D. State flags are almost never burned.
 - E. Most people are against flag burning.

Answer: Option A

Explanation:

If an action is not included under freedom of speech, the speaker's main argument is incorrect.

3. Which of the following best expresses the main point of the passage?
- A. Only veterans care about the flag-burning issue.
 - B. Flag burning almost never happens, so outlawing it is a waste of time.
 - C. Flag burning will be a very important issue in the next election.
 - D. To outlaw flag burning is to outlaw what the flag represents.
 - E. Burning the flag should only be illegal when it is done in foreign countries.

Answer: Option D

Explanation:

The speaker maintains that to burn a flag is an act of freedom of speech, which is among the things the flag represents.

7) Giving children computers in grade school is a waste of money and teachers time. These children are too young to learn how to use computers effectively and need to spend time on learning the basics, like arithmetic and reading. After all, a baby has to crawl before she can walk.

1. Which of the following, if true, would strengthen the speaker's argument?

- A. studies showing computers are expensive
- B. research on the effect of computer games on children
- C. examples of high school students who use computers improperly
- D. proof that the cost of computers is coming down
- E. evidence that using computers makes learning to read difficult

Answer: Option E

Explanation:

This evidence would back up the speaker's contention that young students should learn the basics before learning computers. Choices a and d, which are both about cost, would have no effect on the argument. Choices b and c are too vague.

2. Which of the following, if true, would weaken the speaker's argument?

- A. a demonstration that computers can be used to teach reading and arithmetic
- B. analysis of the cost-effectiveness of new computers versus repairing old computers
- C. examples of adults who do not know how to use computers
- D. recent grade reports of students in the computer classes
- E. a visit to a classroom where computers are being used

Answer: Option A

Explanation:

If computers enhance the learning of arithmetic and reading, the speaker's argument is

not

as strong.

3. Which of the following methods of argument is used in the previous passage?

- A. a specific example that illustrates the speaker's point

- B. attacking the beliefs of those who disagree with the speaker
- C. relying on an analogy to prove the speaker's point
- D. displaying statistics that back up the speaker's point
- E. comparing different methods of learning

Answer: Option C

Explanation:

The speaker uses analogies to compare crawling with learning arithmetic and reading and to compare walking with using a computer. The speaker is making the point that, in both cases, a child needs to learn one before learning the other.

8) Read the below passage carefully and answer the questions:

Quinn: Our state is considering raising the age at which a person can get a driver's license to eighteen. This is unfair because the age has been sixteen for many years and sixteen-year-olds today are no less responsible than their parents and grandparents were at sixteen. Many young people today who are fourteen and fifteen years old are preparing to receive their licenses by driving with a learner's permit and a licensed driver, usually one of their parents. It would not be fair to suddenly say they have to wait two more years.

Dakota: It is true that people have been allowed to receive a drivers license at sixteen for generations. However, in recent years, the increase in traffic means drivers face more dangers than ever and must be ready to respond to a variety of situations. The fact that schools can no longer afford to teach drivers education results in too many young drivers who are not prepared to face the traffic conditions of today.

1. What is the point at issue between Quinn and Dakota?

- A. whether sixteen-year-olds should be required to take drivers education before being issued a license
- B. whether schools ought to provide drivers education to fourteen- and fifteen-year-old students
- C. whether the standards for issuing drivers licenses should become more stringent
- D. whether sixteen-year-olds are prepared to drive in today's traffic conditions
- E. whether parents are able to do a good job teaching their children to drive

Answer: Option D

Explanation:

The speakers support their arguments in different ways, but both are concerned with whether sixteen-year-olds should continue to be allowed to receive drivers licenses.

2. On what does Quinn rely in making her argument?

- A. statistics
- B. emotion
- C. fairness
- D. anecdotes
- E. actualities

Answer: Option C

Explanation:

Quinn discusses the fairness of changing the law and raising the age at which one can receive a driver's license. Emotion (choice b) may be involved, but the argument relies on the fairness issue.

3. On what does Dakota rely in making her argument?

- A. statistics
- B. emotion
- C. fairness
- D. anecdotes
- E. actualities

Answer: Option E

Explanation:

Dakota discusses the actualities of increased traffic and the decline in the teaching of drivers education. She doesn't use statistics (choice a). Her argument is not emotion filled, which rules out choice b. She doesn't mention fairness (choice c) and doesn't tell stories about specific situations (choice d).

2) My ten years old niece is taller than my twelve years old son:

- A. Always
- B. Never
- C. Often
- D. Sometimes

Answer: Option D

3) Which one of the following is always found in 'Phrase'?

- A. Nomenclature
- B. Manifestation
- C. Pictorial effect
- D. Glossary

Answer: Option D

4) If we are going early in the morning towards the south the sun will be visible at our left:

- A. Always
- B. Never
- C. Often
- D. Sometimes

Answer: Option A

Explanation:

Early in the morning the sun is in the direction of east. If we are going towards the south, our face will be in the direction of South and our left hand will be in the direction of east.

Hence if we go early in the morning towards the south the sun will always be visible at our left.

5) Danger always involves

- A. Enemy
- B. Attack
- C. Fear
- D. Help

Answer: Option C

6) Which one of the following is always found in 'Remedy of fault'?

- A. Punishment
- B. Remedy
- C. Fault
- D. Scolding

Answer: Option C

7) of
In India a widow can marry her brother-in-law although a man cannot marry the sister of his dead wife:

- A. Always
- B. Never
- C. Often
- D. Sometimes

Answer: Option D

Explanation:

As there is no such tradition hence this will happen sometimes.

8) A mirror always

VERIFICATION OF TRUTH

1) Which one of the following is always with 'Bargain'?

- A. Exchange
- B. Sumptuousness
- C. Triviality
- D. Eloquence

Answer: Option A

- A. Retracts B. Distorts
C. Refracts D. Reflects

Answer: Option D

- 9) A bulb always has
A. Glass B. Current
C. Filament D. Light

Answer: Option C

- 10) Which one of the following is always found in 'Wonder'?
A. Crowd B. Lumber
C. Astonishment D. Rustic

Answer: Option C

- 11) Disclosure always involves
A. Agents B. Display
C. Exposition D. Secrets

Answer: Option D

- 12) What is always in worry?
A. Difficulty B. Unrest
C. Non-Cooperation D. Poignancy

Answer: Option B

- 13) Which one of the following is always associated with 'tree'?
A. Flowers B. Leaves
C. Fruits D. Roots

Answer: Option D

- 14) Which one of the following is always associated with 'justice'?
A. Hypocrisy B. Legitimate
C. Magnanimity D. Diminutiveness

Answer: Option B

- 15) A hill always has
A. Trees B. Height
C. Animals D. Water

Answer: Option B

- 16) What is found necessarily in newspaper?
A. Date B. Advertisement
C. News D. Editor

Answer: Option C

- 17) Controversy always involves
A. Dislike B. Injustice
C. Disagreement D. Passion

Answer: Option C

- 18) Which one of the following is always in 'Sentiment'?
A. Cruelty B. Insight
C. Neutrality D. Emotion

Answer: Option D

- 19) A camera always has
A. Reels B. Flash
C. Stand D. Lens

Answer: Option D

- 20) What is found necessarily in a race?
A. Judge B. Spectators
C. Competitor D. Prize

Answer: Option C

BLOOD RELATIONS

Pointing to a photograph of a boy Suresh said, "He is the son of the only son of my mother." How is Suresh related to that boy?

- A. Brother B. Uncle
C. Cousin D. Father

Answer: Option D

Explanation:

The boy in the photograph is the only son of the son of Suresh's mother i.e., the son of Suresh. Hence, Suresh is the father of boy.

- 2) If A + B means A is the mother of B; A - B means A is the brother B; A % B means A is the father of B and A x B means A is the sister of B, which of the following shows that P is the maternal uncle of Q?

A.Q - N + M x P
C.P - M + N x Q

Answer: Option C

Explanation:

P - M → P is the brother of M

M + N → M is the mother of N

N x Q → N is the sister of Q

Therefore, P is the maternal uncle of Q.

- 3) If A is the brother of B; B is the sister of C; and C is the father of D, how D is related to A?

A.Brother
C.Nephew

Answer: Option D

Explanation:

If D is Male, the answer is Nephew.

If D is Female, the answer is Niece.

As the sex of D is not known, hence, the relation between D and A cannot be determined.

Note: Niece - A daughter of one's brother or sister, or of one's brother-in-law or sister-in-law. Nephew - A son of one's brother or sister, or of one's brother-in-law or sister-in-law.

- 4) If A + B means A is the brother of B; A - B means A is the sister of B and A x B means A is the father of B. Which of the following means that C is the son of M?

A.M - N x C + F
C.N + M - F x C

Answer: Option D

Explanation:

M x N → M is the father of N

N - C → N is the sister of C

and C + F → C is the brother of F.

Hence, M is the father of C or C is the son of M.

- 5) Introducing a boy, a girl said, "He is the son of the daughter of the father of my uncle." How is the boy related to the girl?

A.Brother
C.Uncle
B.Nephew
D.Son-in-law

Answer: Option A

Explanation:

The father of the boy's uncle → the grandfather of the boy and daughter of the grandfather → sister of father.

- 6) If D is the brother of B, how B is related to C? To answer this question which of the statements is/are necessary?

The son of D is the grandson of C.
B is the sister of D.

A.Only 1
C.Either 1 or 2
B.Only 2
D.1 and 2 both are required

Answer: Option D

Explanation:

Given: D is the brother of B.

From statement 1, we can detect that D is son of C (son of D is the grandson of C).

From statement 2, we can detect that B is 'Female' (sister of D).

Therefore, B is daughter of C.

- 7) If A + B means A is the father of B; A - B means A is the brother B; A % B means A is the wife of B and A x B means A is the mother of B, which of the following shows that M is the maternal grandmother of T?

A.M x N % S + T
C.M x S - N % T
B.M x N - S % T
D.M x N x S % T

Answer: Option A

Explanation:

M x N → M is the mother of N

N % S → N is the wife of S

and S + T → is the father of T.

Hence, M is the maternal grandmother of T.

- 8) A and B are children of D. Who is the father of A? To answer this question which of the statements (1) and (2) is necessary?

C is the brother of A and the son of E.

F is the mother B.

A.Only (1)
C.Either (1) or (2)
B.Only (2)
D.(1) and (2) both

Answer: Option B

Explanation:

A and B are children of D.

From (1), C is the brother B and son of E.

Since, the sex of D and E are not known. Hence (1) is not sufficient to answer the question.

- From (2). F is the mother of B. Hence, F is also the mother of A. Hence D is the father of A. Thus, (2) is sufficient to answer the question.
- 9) If P \$ Q means P is the brother of Q; P # Q means P is the mother of Q; P * Q means P is the daughter of Q in A # B \$ C * D, who is the father?
- A.D B.B
C.C D.Data is inadequate
- Answer:** Option A
- Explanation:**
- A is the mother of B, B is the brother of C and C is the daughter of D. Hence, D is the father.
- A (Parents) D
| |
| |
B - is - Brother - of - C
- 10) A3P means A is the mother of P
A4P means A is the brother of P
A9P means A is the husband of P
A5P means A is the daughter of P
Which of the following means that K is the mother-in-law of M?
- A.M9N3K4J B.M9N5K3J
C.K5J9M3N D.K3J9N4M
- Answer:** Option B
- Explanation:**
- M9N → M is the husband of N
N5K → N is the daughter of K
Hence, → M is the son-in-law of K
K3J → K is the mother of J
Hence, → K is a lady
Hence, → K is the mother-in-law of M.
- 11) P is the mother of K; K is the sister of D; D is the father of J. How is P related to J?
- A.Mother B.Grandmother
C.Aunt D.Data inadequate
- Answer:** Option B
- Explanation:**
- P is the mother of K
K is the sister of D
D is the father of J.
Therefore, J is the nephew or niece of K and P is the grandmother of J.
- 12) Pointing to Gopi, Nalni says, "I am the daughter of the only son of his grandfather." How Nalni is related to Gopi?
- A.Niece B.Daughter
- 13) C.Sister D.Cannot be determined
Answer: Option C
- Explanation:**
- Nalni is the daughter of the only son of Gopi's grandfather. Hence, it's clear that Nalni is the sister of Gopi.
- M is the father of N who is the son of V. In order to know the relation of M to P, which of the statement/statements is/are necessary?
- P is the brother of V.
The daughter of N is the granddaughter of V.
- A.Only (1) B.Only (2)
C.Either (1) or (2) D.(1) and (2) both
- Answer:** Option A
- Explanation:**
- M is the father of N and N is the son of V.
Hence, V is the mother of N.
From (1), P is the brother of V
Therefore, M is the brother-in-law of P because V is the wife of M.
From (2), the daughter of N, is the granddaughter of V. From this we do not get any relation of M to P.
- 14) A*B means A is the sister of B
A \$ B means B is the mother of A
A + B means A is the brother of B
A = B means B is the father of A.
Which of the following means M is the maternal uncle of N?
- A.M = P + Q * N B.N + P = Q * M
C.N * P \$ Q * M D.None of these
- Answer:** Option D
- 15) Anupam said to a lady sitting in a car, "The only daughter of the brother of my wife is the sister-in-law of the brother of your sister." How the husband of the lady is related to Anupam?
- A.Maternal uncle B.Uncle
C.Father D.Son-in-law
- Answer:** Option D
- Explanation:**
- Anupam's son-in-law is the brother of the lady who was sitting in the car. Hence, the husband is also the son-in-law of Anupam.
- 16) Deepak said to Nitin, "That boy playing with the football is the younger of the two brothers of the daughter of my father's wife." How is the boy playing football related to Deepak?
- A.Son B.Brother

C. Cousin

Answer: Option B

Explanation:

Father's wife → mother. Hence, the daughter of the mother means sister and sister's younger brother means brother. Therefore, the boy is the brother of Deepak.

D. Brother-in-law

Hence, L is the mother of M, P is the maternal aunt of M and N is the maternal uncle of M.

17) M % N means M is the son of N.

M @ N means M is the sister of N.

M \$ N means M is the father of N.

1. Which of the following shows the relation that C is the granddaughter of E?

A. C % B \$ F \$ E

B. B \$ F \$ E % C

C. C @ B % F % E

D. E % B \$ F \$ C

Answer: Option C

Explanation:

C @ B → C is the sister of B

B % F → B is the son of F

Hence, → C is the daughter of F

F % E → F is the son of E

Hence, → C is the granddaughter of E.

2. Which of the following shows the relation that S is the father of Q?

A. S @ P \$ Q

B. Q @ P % S

C. Q \$ S @ P

D. None of these

Answer: Option D

18) A + B means A is the mother of B.

A - B means A is the sister of B.

A * B means A is the father of B.

A β B means A is the brother of B.

1. Which of the following means Q is the grandfather of P?

A. P + N * M * Q

B. Q * N * M + P

C. Q β M β N * P

D. None of these

Answer: Option D

2. Which of the following means that N is the maternal uncle of M?

A. N β P - L + E - M

B. N - Y + A β M

C. M - Y * P - N

D. N β C + F * M

Answer: Option A

Explanation:

N β P → N is the brother of P

P - L → P is the sister of L

L + E → L is the mother of E

E - M → E is the sister of M.

MATCHING DEFINITION

1) People speculate when they consider a situation and assume something to be true based on inconclusive evidence. Which situation below is the best example of Speculation?

A. Francine decides that it would be appropriate to wear jeans to her new office on Friday after reading about "Casual Fridays" in her employee handbook.

B. Mary spends thirty minutes sitting in traffic and wishes that she took the train instead of driving.

C. After consulting several guidebooks and her travel agent, Jennifer feels confident that the hotel she has chosen is first-rate.

D. When Emily opens the door in tears, Theo guesses that she's had a death in her family.

Answer: Option D

Explanation:

This is the only situation in which someone makes an assumption that is not based on conclusive evidence. Choices a and c reflect situations in which assumptions are made based on evidence. In choice b, Mary is not assuming anything to be true. She is simply wishing that she'd made a different decision.

2) Posthumous Publication occurs when a book is published after the author's death. Which situation below is the best example of Posthumous Publication?

A. Richard's illness took his life before he was able to enjoy the amazing early reviews of his novel.

B. Melissa's publisher cancels her book contract after she fails to deliver the manuscript on time.

C. Clarence never thought he'd live to see the third book in his trilogy published.

D. Elizabeth is honored with a prestigious literary award for her writing career and her daughter accepts the award on behalf of her deceased mother.

Answer: Option A

Explanation:

Although choice d also mentions a writer who has died, it does not state that one of the writer's books was published after her death, only that she received an award. Choice a states that Richard wasn't around to see the early reviews of his novel, therefore implying that Richard died before the book was published. The other two options depict living writers.

3) Establishing a Power of Attorney occurs when a legal document is created that gives one individual the authority to act for another. Which situation below is the best example of Establishing a Power of Attorney?

A. Louise is selling her house and she hires a lawyer to review the contract.

B. Simone's mother can no longer get to the bank to cash her checks and make deposits, so she has taken legal steps to enable Simone to do these things for her.

C. Jack's father is elderly and Jack thinks he is no longer able to make decisions for himself.

D.At her daughter's urging, Mrs.Lenox opens up a retirement account with the local bank.

Answer: Option B

Explanation:

Simone's mother has taken legal steps to allow another person to act on her behalf. Therefore, this is the only choice that indicates that a power of attorney has been established.

4)Embellishing the Truth occurs when a person adds fictitious details or exaggerates facts or true stories. Which situation below is the best example of Embellishing the Truth?

A.Isabel goes to the theater, and the next day, she tells her coworkers she thought the play was excellent.

B.The realtor describes the house, which is eleven blocks away from the ocean, as prime waterfront property.

C.During the job interview, Fred, who has been teaching elementary school for ten years, describes himself as a very experienced teacher.

D.The basketball coach says it is likely that only the most talented players will get a college scholarship.

Answer: Option B

Explanation:

The realtor is using a clear exaggeration when she states that a house which is eleven blocks away from the ocean is prime waterfront property.

5)Reentry occurs when a person leaves his or her social system for a period of time and then returns. Which situation below best describes Reentry ?

A.When he is offered a better paying position, Jacob leaves the restaurant he manages to manage a new restaurant on the other side of town.

B.Catherine is spending her junior year of college studying abroad in France.

C.Malcolm is readjusting to civilian life after two years of overseas military service.

D.After several miserable months, Sharon decides that she can no longer share an apartment with her roommate Hilary.

Answer: Option C

Explanation:

Malcolm is the only person returning to a social system that he has been away from for an extended period of time.

6)A Tiebreaker is an additional contest or period of play designed to establish a winner among tied contestants. Which situation below is the best example of a Tiebreaker?

A.At halftime, the score is tied at 28.

B.Mary and Megan have each scored three goals in the game.

C.The referee tosses a coin to decide which team will have possession of the ball first.

D.The Sharks and the Bears each finished with 14 points, and they are now battling it out in a five-minute overtime.

Answer: Option D

Explanation:

This is the only choice that indicates that an additional period of play is taking place to determine the winner of a game that ended in a tie.

7)In the Maple Hill school district, a Five-Day Suspension occurs when a student is not permitted to attend school for five days for (1) physically assaulting another student, a teacher, or a school employee or (2) willfully destructing or defacing school property. Which situation below is the best example of a Five-Day Suspension?

A.Lillian gets caught cheating on a math test for the second time and is suspended from school.

B.Marc is asked to leave the classroom due to his constant disruptions.

C.Franny uses spray paint to write derogatory comments on the locker room wall and she is given a suspension.

D.Ms. Farmer tells her class that students who fail the midterm exam will be expected to stay after school for tutoring help.

Answer: Option C

Explanation:

Although choices a and c both describe suspensions, only choice c describes a suspension that is the result of one of the two scenarios given in the definition of a five-day suspension (physical assault or destructing or defacing school property). Therefore, we can assume that Franny's suspension, which is the result of spray painting school property, will be a five-day suspension. Since the definition doesn't provide any information about suspensions for cheating, we can assume that Lillian's suspension does not fall into the five-day suspension category.

8)Erratic Behavior occurs when an individual acts in a manner that lacks consistency, regularity, and uniformity. Which situation below is the best example of Erratic Behavior?

A.Julia cannot contain her anger whenever the subject of local politics is discussed.

B.Martin has just been told that he is being laid off. Before leaving his supervisor's office, he punches a hole in the door.

C.Rhonda has visited the dealership several times, but she still cannot decide which car to buy.

D.In the past month, Jeffrey, who has been a model employee for three years, has repeatedly called in sick, forgotten important meetings, and been verbally abusive to colleagues.

Answer: Option D

Explanation:

Jeffrey's recent behavior is clearly inconsistent and irregular.

9)A Guarantee is a promise or assurance that attests to the quality of a product that is either (1) given in writing by the manufacturer or (2) given verbally by the person selling the product. Which situation below is the best example of a Guarantee?

A.Melissa purchases a DVD player with the highest consumer ratings in its category.

B.The salesperson advises Curt to be sure that he buys an air conditioner with a guarantee.

C.The local auto body shop specializes in refurbishing and selling used cars.

D.Lori buys a used digital camera from her coworker who says that she will refund Lori's money if the camera's performance is not of the highest quality.

Answer: Option D

Explanation:

Choices a, b, and c do not describe situations in which a product is guaranteed. Only choice d reflects a situation in which a seller attests to the quality of a product by giving the buyer a promise or assurance about its quality.

10) The rules of baseball state that a batter Legally Completes His Time at Bat when he is put out or becomes a base runner. Which situation below is the best example of a batter Legally Completing His Time at Bat?

- A.Jared's blooper over the head of the short-stop puts him in scoring position.
- B.The umpire calls a strike, even though the last pitch was way outside.
- C.The pitcher throws his famous knuckleball, Joe swings and misses, and the umpire calls a strike.
- D.The count is two balls and two strikes as Mario waits for the next pitch.

Answer: Option A

Explanation:

The fact that Jared is in scoring position due to his blooper indicates that he has hit the ball and is now a base runner; therefore, he has legally completed his time at bat. Choices b and c both describe situations in which a strike is called, but they do not state that the batter has been put out or that he is now a base runner. Choice d describes a situation in which the batter, Mario, is still at the plate waiting for the next pitch.

11) It is appropriate to compensate someone if you have damaged his or her property in some way. This is called Restitution. Which situation below is the best example of Restitution?

- A.Jake borrows Leslie's camera and the lens shatters when it falls on the ground because he fails to zipper the case. When Jake returns the camera, he tells Leslie that he will pay for the repair.
- B.Rebecca borrows her neighbor's car, and when she returns it, the gas tank is practically empty. She apologizes profusely and tells her neighbor she will be more considerate the next time.
- C.Aaron asks Tom to check in on his apartment while he is out of town. When Tom arrives, he discovers that a pipe has burst and there is a considerable amount of water damage. He calls a plumber to repair the pipe.
- D.Lisa suspects that the pothole in her company's parking lot caused her flat tire. She tells her boss that she thinks the company should pay for the repair.

Answer: Option A

Explanation:

Jake damaged Leslie's camera while it was in his possession and he has agreed to compensate Leslie for the cost of the repair.

THEME DETECTION

1) Though the waste of time or the expenditure on fashions is very large, yet fashions have come to stay. They will not go, come what may. However, what is now required is that strong efforts

should be made to displace the excessive craze for fashion from the minds of these youngsters.

The passage best supports the statement that:

- A. fashion is the need of the day.
- B. the excessive craze for fashion is detrimental to one's personality.
- C. the hoard for fashion should be done away with so as not to let down the constructive development.
- D. work and other activities should be valued more than the outward appearance.

Answer: Option C

2) Emerson said that the poet was landlord, Sealord, airlord. The flight of imagination made the poet master of land, sea and air. But a poet's dream of yesterday becomes today an actual achievement and a reality for all men. Even those who invented, improved and perfected the aeroplane could hardly have dreamt of the possibility of flight into outer space. The passage best supports the statement that:

- A.seemingly impossible imaginations make one a good poet,
- B.all imaginations become a reality some day.
- C.what man imagined has never been impossible; he has always turned it a reality through his conception of ideas and sheer hard labour.
- D.man has reached the climax of technological development with his exploration into outer space.

Answer: Option C

3) The school has always been the most important means of transferring the wealth of tradition from one generation to the next. This applies today in an even higher degree than in former times for, through the modern development of economy, the family as bearer of tradition and education has become weakened. This passage best supports the statement that for transferring the wealth of tradition from one generation to the next -

- A.there are means other than the school.
- B.several different sources must be tried.
- C.economic development plays a crucial role
- D.modern technology must be put to use.
- E.family, as ever, is the most potent means.

Answer: Option C

4) Industrial exhibitions play a major role in a country's economy. Such exhibitions, now regularly held in Delhi, enable us to measure the extent of our own less advanced industrial progress and the mighty industrial power and progress of countries like the U.K., U.S.A. and Russia whose pavilions are the centres of the greatest attention and attractions. The passage best supports the statement that industrial exhibitions -

- A.greatly tax the poor economies.
- B.are more useful for the developed countries like U.S.A. whose products stand out superior to those of the developing countries.
- C.are not of much use to the countries who are industrially backward.
- D.boost up production qualitatively and quantitatively by analytical comparison of a country's products with those of the developed countries

Answer: Option D

5) To forgive an injury is often considered to be a sign of weakness; it is really a sign of strength. It is easy to allow oneself to be carried away by resentment and hate into an act of vengeance; but it takes a strong character to restrain those natural passions. The man who forgives an injury proves himself to be the superior of the man who wronged himself and puts the wrong-doer to shame.

The passage best supports' the statement that:

- A.the sufferer alone knows the intensity of his sufferings.
- B.people tend to forgive the things happened in the past.
- C.natural passions are difficult to suppress.
- D.mercy is the noblest form of revenge.
- E.a person with calm and composed nature has depth of thought and vision.

Answer: Option D

6) The prevention of accidents makes it necessary not only that safety devices be used to guard exposed machinery but also that mechanics be instructed in safety rules which they must follow for their own protection, and that lighting in the plant be adequate.

The passage best supports the statement that industrial accidents -

- A.are always avoidable;
- B.may be due to ignorance.
- C.cannot be entirely overcome.
- D.can be eliminated with the help of safety rules.
- E.usually result from inadequate machinery.

Answer: Option D

7) The future of women in India is quite bright and let us hope that they will justify their abilities by rising to the occasion. Napoleon was right when he declared that by educating the women we can educate the whole nation. Because a country can never rise without the contribution of 50% of their population.

The passage best supports the statement that:

- A.India is striving hard for the emancipation of women.
- B.all women should be well educated.
- C.a nation can progress only when women are given equal rights and opportunities as men.
- D.women ought to be imparted full freedom to prove their worth and contribute to the progress of the nation.

Answer: Option D

8) One of the important humanitarian by-products of technology is the greater dignity and value that it imparts to human labour. In a highly industrialized society, there is no essential difference between Brahmin and Dalit, Muslim and Hindu; they are equally useful and hence equally valuable for in the industrial society individual productivity fixes the size of the pay cheque and this fixes social status.

The passage best supports the statement that:

- A.technology decides individual's social status.
- B.castes and religions are man-made.
- C.human labour has dignity and value.
- D.all individuals, irrespective of caste and creed, are born equal.

E.industrial society is a great leveller of men.

Answer: Option C

9) There is a shift in our economy from a manufacturing to a service orientation. The increase in service-sector will require the managers to work more with people rather than with objects and things from the assembly line. This passage best supports the statement that:

- A.managers should have a balanced mind.
- B.assembly line will exist in service organisations.
- C.interpersonal skills will become more important in the future work place.
- D.manufacturing organisations ignore importance of people.
- E.service organisations will not deal with objects and things.

Answer: Option C

10) The virtue of art does not allow the work to be interfered with or immediately ruled by anything other than itself. It insists that it alone shall touch the work in order to bring it into being. Art requires that nothing shall attain the work except through art itself. This passage best supports the statement that:

- A.art is governed by external rules and conditions.
- B.art is for the sake of art and life.
- C.art is for the sake of art alone.
- D.artist realises his dreams through his artistic creation.
- E.artist should use his art for the sake of society.

Answer: Option C

