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QUANTITATIVE APTITUDE

NUMBERS

I. Even and Odd Integers

Sum of an odd number of odd integers is odd.

Sum of an even number of odd integers is even.

Sum of any number of even integers is even.

Product of any number of even integers is even.

Product of any number of odd integers is odd.

II. Divisibility Criteria

A given number n is divisible by a number k.

k	n is divisible by k if
2	the last digit of n is divisible by 2,
3	the sum of the digits of n is a multiple of 3,
4	the number formed by the last two digits is divisible by 4,
5	the last digit is 0 or 5,
6	n is divisible by both 2 and 3,
8	the number formed by the last three digits is divisible by 8,
9	the sum of the digits of n is a multiple of 9,
10	the last digit is 0,
11	(Sum of its digits at the odd place) – (Sum of its digits at even place) is equal to 0 or 11x

1. Results on Division = Dividend = Quotient × Divisor + Remainder
2. Number of Divisors:
   - Steps involved in determining the number of divisors of a number n:
   - Express n as a product of powers of prime numbers, say $n = pk \times qm \times rs$.
   - The number of divisors = $(k + 1)(m + 1)(s + 1)$.

If $pq = 60$, what is the maximum number of values p can take?

Given condition implies that p and q are divisors of 60.

Now, 60 = 22.31.51 and hence the number of divisors of

60 = (2 + 1)(1 + 1)(1 + 1) = 12.

So, p can take any of these 12 values.

III. Prime Number

A natural number which has exactly 2 factors is a prime number. Ex number 2 has factors 1 and 2 only. Similarly 3,5,7,11,13,17,19,23,29,31,37,41 etc . **1 is not a prime number. A number n is a prime number if it is not divisible by any prime less than [√n] where [√n] is the largest natural number less than or equal to √n.**

IV. Some Basic Formulae:

i. $(a + b)(a - b) = (a^2 - b^2)$

ii. $(a + b)^2 = (a^2 + b^2 + 2ab)$

iii. $(a - b)^2 = (a^2 + b^2 - 2ab)$

iv. $(a + b + c)^2 = a^2 + b^2 + c^2 + 2(ab + bc + ca)$

v. $(a^3 + b^3) = (a + b)(a^2 - ab + b^2)$

vi. $(a^3 - b^3) = (a - b)(a^2 + ab + b^2)$

vii. $(a^3 + b^3 + c^3 - 3abc) = (a + b + c)(a^2 + b^2 + c^2 - ab - bc - ac)$

viii. When $a + b + c = 0$, then $a^3 + b^3 + c^3 = 3abc$.

Arithmetic Progression (A. P.) with first term 'a' and Common Difference 'd' is given by:

[a], [(a + d)], [(a + 2d)], … … …, [a + (n - 1)d]

nth term, Tn = a + (n - 1)d

Sum of first 'n' terms, Sn = n/2 (First Term + Last Term)

Geometric Progression (G. P.) with first term 'a' and Common Ratio 'r' is given by:

a, ar, ar^2, ar^3, … … …, ar^{n-1}

nth term, Tn = ar^{n-1}

Sum of first 'n' terms Sn = [a(1 - r^n)] / [1 - r]

(1 + 2 + 3 + … … … + n) = [n(n + 1)] / 2

($1^2 + 2^2 + 3^2$ + ……+n^2) = [n(n + 1)(2n + 1)] / 6

($1^3 + 2^3 + 3^3$ + ……+n^3) = [$n^2((n + 1)^2$] / 4

EXERCISES

1) 1397 × 1397 = ?

2) (112 × 5^4) = ?

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?

4) Which one of the following is not a prime number?
A.31 B.61 C.71 D.91

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

6) How many of the following numbers are divisible by 132?
264, 396, 462, 792, 968, 2178, 5184,

6336

7) (935421 x 625) = ?

8) The largest 4 digit number exactly divisible by 88 is:
A.9944 B.9768 C.9988
D.8888 E. None of these

9) On dividing a number by 5, we get 3 as remainder. What will the remainder when the square of the number is divided by 5?
A. 0 B. 1 C. 2 D. 4

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
A. 5 B. 6 C. 7 D. None of these

11) $(x^n - a^n)$ is completely divisible by $(x - a)$, when
A. n is any natural number
B. n is an even natural number
C. n is and odd natural number
D. n is prime

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) =
A. 10 B. 11 C. 12 D. 15

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

14) $\dfrac{(963 + 476)^2 + (963 - 476)^2}{(963 \times 963 + 476 \times 476)} = ?$

15) 8597 - ? = 7429 - 4358

16) (12345679 x 72) = ?

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

18) Which of the following numbers will completely divide (4915 - 1)

19) (112 + 122 + 132 + ... + 202) = ?

20) (51 + 52 + 53 + ... + 100) = ?

21) (1 - 1/n) + (1 - 2/n) + (1 -3/n) + ... up to n terms =?

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

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:

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:

25) How many prime numbers are less than 50?

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?

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?

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

29) $5358 \times 51 = ?$

30) The sum of first five prime numbers is

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?

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

33) $72519 \times 9999 = ?$

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

35) The smallest 3 digit prime number is

36) Which one of the following numbers is exactly divisible by 11?
A. 235641 B. 245642 C. 315624 D. 415624

37) (?) - 19657 - 33994 = 9999

38) The sum of first 45 natural numbers is

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

40) $\dfrac{753 \times 753 + 247 \times 247 - 753 \times 247}{753 \times 753 \times 753 + 247 \times 247 \times 247} = ?$

41) Which of the following number is divisible by 24?
A. 35718 B. 63810
C. 537804 D. 3125736

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

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

44) The difference between a positive proper fraction and its reciprocal is 9/20. The fraction is

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

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

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

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

49) Which of the following is a prime number
A.33 B.81 C.93 D.97

V. 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?

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

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

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

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

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

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

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

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

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

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

12) Three times the first of three consecutive odd integers is 3 more than twice the third. The third integer is:

13) The difference between a two-digit number and the number obtained by interchanging the positions of its digits is 36. What is the difference between the two digits of that number?

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?

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:

VI. FIND ODD NUMBER

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

2) 1, 4, 9, 1, 20, 36, 49

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

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

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

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

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

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

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

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

11) 10, 25, 45, 54, 60, 75, 80

12) 8, 27, 64, 100, 125, 216, 343

13) 6, 9, 15, 21, 24, 28, 30

14) 396, 462, 572, 396, 427, 671, 264

VII. WRONG MAN OUT

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

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

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

4) 5, 16, 6, 16, 7, 16, 9

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

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

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

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

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

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

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

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

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

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

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

VIII. MISSING MAN OUT

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

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

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

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

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

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

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

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

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

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

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

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

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

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

IX. WRONG NUMBER OUT

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

X. NUMBER SERIES

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

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

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

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

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

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

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

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

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

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

11) Choose which pair of numbers comes next 9 16 23 30 37 44 51

12) Choose which pair of numbers comes next 2 8 14 20 26 32 38

13) 9 11 33 13 15 33 17

14) 2 3 4 5 6 4 8

15) 17 17 34 20 20 31 23

16) 6 20 8 14 10 8 12

17) 21 25 18 29 33 18

18) 75 65 85 55 45 85 35

19) 11 16 21 26 31 36 41

20) 11 16 21 26 31 36 41

21) 42 40 38 35 33 31 28

22) 6 10 14 18 22 26 30

23) 8 12 9 13 10 14 11

24) 36 31 29 24 22 17 15

25) 3 5 35 10 12 35 17

26) 13 29 15 26 17 23 19

27) 14 14 26 26 38 38 50

28) 44 41 38 35 32 29 26

29) 34 30 26 22 18 14 10

30) 32 31 32 29 32 27 32

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

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

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

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

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

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

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

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

39) Look at this series: 0.15, 0.3, ____, 1.2, 2.4, ... What number should fill the blank?

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

PROBLEMS ON H.C.F AND L.C.M

IMPORTANT FORMULAS

1. Factors and Multiples:

   If number a divided another number b exactly, we say that a is a factor of b.

   In this case, b is called a multiple of a.

2. Highest Common Factor (H.C.F.) or Greatest Common Measure (G.C.M.) or Greatest Common Divisor (G.C.D.):

   The H.C.F. of two or more than two numbers is the greatest number that divided each of them exactly.

   There are two methods of finding the H.C.F. of a given set of numbers:

   I. Factorization Method: Express the each one of the given numbers as the product of prime factors. The product of least powers of common prime factors gives H.C.F.

   II. Division Method: Suppose we have to find the H.C.F. of two given numbers, divide the larger by the smaller one. Now, divide the divisor by the remainder. Repeat the process of dividing the preceding number by the remainder last obtained till

zero is obtained as remainder. The last divisor is required H.C.F.

Finding the H.C.F. of more than two numbers: Suppose we have to find the H.C.F. of three numbers, then, H.C.F. of [(H.C.F. of any two) and (the third number)] gives the H.C.F. of three given number.

Similarly, the H.C.F. of more than three numbers may be obtained.

3. Least Common Multiple (L.C.M.):

The least number which is exactly divisible by each one of the given numbers is called their L.C.M.

There are two methods of finding the L.C.M. of a given set of numbers:

I. Factorization Method: Resolve each one of the given numbers into a product of prime factors. Then, L.C.M. is the product of highest powers of all the factors.

II. Division Method (short-cut): Arrange the given numbers in a row in any order. Divide by a number which divided exactly at least two of the given numbers and carry forward the numbers which are not divisible. Repeat the above process till no two of the numbers are divisible by the same number except 1. The product of the divisors and the undivided numbers is the required L.C.M. of the given numbers.

4. Product of two numbers = Product of their H.C.F. and L.C.M.

5. Co-primes: Two numbers are said to be co-primes if their H.C.F. is 1.

6. H.C.F. and L.C.M. of Fractions:

1. H.C.F. = $\frac{\text{H.C.F. of Numerators}}{\text{L.C.M. of Denominators}}$

2. L.C.M. = $\frac{\text{L.C.M. of Numerators}}{\text{H.C.F. of Denominators}}$

8. H.C.F. and L.C.M. of Decimal Fractions:

In a given numbers, make the same number of decimal places by annexing zeros in some numbers, if necessary. Considering these numbers without decimal point, find H.C.F. or L.C.M. as the case may be. Now, in the result, mark off as many decimal places as are there in each of the given numbers.

9. Comparison of Fractions:

Find the L.C.M. of the denominators of the given fractions. Convert each of the fractions into an equivalent fraction with L.C.M as the denominator, by multiplying both the numerator and denominator by the same number. The resultant fraction with the greatest numerator is the greatest.

EXERCISES

1) The product of two numbers is 4107. If the H.C.F. of these numbers is 37, then the greater number is

2) Three numbers are in the ratio of 3 : 4 : 5 and their L.C.M. is 2400. Their H.C.F. is

3) The G.C.D. of 1.08, 0.36 and 0.9 is

4) The product of two numbers is 2028 and their H.C.F. is 13. The number of such pairs is

5) The least multiple of 7, which leaves a remainder of 4, when divided by 6, 9, 15 and 18 is

6) Find the lowest common multiple of 24, 36 and 40.

7) The least number which should be added to 2497 so that the sum is exactly divisible by 5, 6, 4 and 3 is

8) Reduce 128352 / 238368 to its lowest terms.

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

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 ?

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

12) What will be the least number which when doubled will be exactly divisible by 12, 18, 21 and 30 ?

13) The ratio of two numbers is 3 : 4 and their H.C.F. is 4. Their L.C.M. is

14) The smallest number which when diminished by 7, is divisible 12, 16, 18, 21 and 28 is

15) 252 can be expressed as a product of primes as

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

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

18) Find the highest common factor of 36 and 84.

19) Find the greatest number that will divide 43, 91 and 183 so as to leave the same remainder in each case.

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:

21) Six bells commence tolling together and toll at intervals of 2, 4, 6, 8 10 and 12

22) Let N be the greatest number that will divide 1305, 4665 and 6905, leaving the same

seconds respectively. In 30 minutes, how many times do they toll together ?

23) The greatest number of four digits which is divisible by 15, 25, 40 and 75 is:

A. 9000 B. 9400
C. 9600 D. 9800

25) The least number, which when divided by 12, 15, 20 and 54 leaves in each case a remainder of 8 is

remainder in each case. Then sum of the digits in N is:

24) Which of the following fraction is the largest?

A. 7/8 B. 13/16
C. 31/40 D. 63/80

SURDS AND INDICES

IMPORTANT FORMULAS

1. Laws of Indices:

$a^m \times a^n = a^{m+n}$

$\frac{a^m}{a^n} = a^{m-n}$

$(a^m)^n = a^{mn}$

$(ab)^n = a^n b^n$

$(\frac{a}{b})^n = \frac{a^n}{b^n}$

$a^0 = 1$

2. Surds:

Let a be rational number and n be a positive integer such that $a^{(1/n)} = \sqrt[n]{a}$

Then, $\sqrt[n]{a}$ is called a surd of order n.

3. Laws of Surds:

$\sqrt[n]{a} = a^{(1/n)}$

$\sqrt[n]{ab} = \sqrt[n]{a} \times \sqrt[n]{b}$

$\sqrt[n]{\frac{a}{b}} = \frac{\sqrt[n]{a}}{\sqrt[n]{a}}$

$(\sqrt[n]{a})^n = a$

$\sqrt[m]{\sqrt[n]{a}} = \sqrt[mn]{a}$

$(\sqrt[n]{a})^m = \sqrt[n]{a^m}$

EXERCISES

1) $(256)^{0.16} \times (256)^{0.09} = ?$

2) The value of $[(10)^{150} \div (10)^{146}]$

3) If $\left(\frac{a}{b}\right)^{x-1} = \left(\frac{b}{a}\right)^{x-3}$ then the value of x is

4) $(25)^{7.5} \times (5)^{2.5} \div (125)^{1.5} = 5^?$

5) $(0.04)^{-1.5} = ?$

6) $\frac{(243)^{n/5} \times 3^{2n+1}}{9^n \times 3^{n-1}} = ?$

7) $\frac{1}{1 + a^{(n-m)}} + \frac{1}{1 + a^{(m-n)}} = ?$

8) If m and n are whole numbers such that $m^n = 121$, the value of $(m - 1)^{n+1}$ is

9) $\left(\frac{x^b}{x^c}\right)^{(b+c-a)} \cdot \left(\frac{x^c}{x^a}\right)^{(c+a-b)} \cdot \left(\frac{x^a}{x^b}\right)^{(a+b-c)} = ?$

10) If $x = 3 + 2\sqrt{2}$, then the value of $\left(\sqrt{x} - \frac{1}{\sqrt{x}}\right)$ is:

11) $(17)^{3.5} \times (17)^? = 17^8$

12) Given that $10^{0.48} = x$, $10^{0.70} = y$ and $x^z = y^2$, then the value of z is close to

13) If $5^a = 3125$, then the value of $5^{(a-3)}$ is

14) If $3^{(x-y)} = 27$ and $3^{(x+y)} = 243$, then x is equal to

1) $\frac{1}{1 + x^{(b-a)} + x^{(c-a)}} + \frac{1}{1 + x^{(a-b)} + x^{(c-b)}} + \frac{1}{1 + x^{(b-c)} + x^{(a-c)}} = ?$

PROBLEMS ON TRAINS

IMPORTANT FORMULAS

1. *km/hr to m/s conversion:*

a km/hr $= \left(a \times \frac{5}{18}\right)$ m/s.

2. *m/s to km/hr conversion:*

a m/s $= \left(a \times \frac{18}{5}\right)$ km/hr.

3. Time taken by a train of length l metres to pass a pole or standing man or a signal post is

equal to the time taken by the train to cover l metres.

4. Time taken by a train of length l metres to pass a stationery object of length b metres is the time taken by the train to cover $(l + b)$ metres.
5. Suppose two trains or two objects bodies are moving in the same direction at u m/s and v m/s, where $u > v$, then their relative speed is = $(u - v)$ m/s.
6. Suppose two trains or two objects bodies are moving in opposite directions at u m/s and v m/s, then their relative speed is = $(u + v)$ m/s.
7. If two trains of length a metres and b metres are moving in opposite directions at u m/s and v m/s, then:

   The time taken by the trains to cross each other = $\frac{(a + b)}{(u + v)}$ sec.
8. If two trains of length a metres and b metres are moving in the same direction at u m/s and v m/s, then:

   The time taken by the faster train to cross the slower train = $\frac{(a + b)}{(u - v)}$ sec.
9. If two trains (or bodies) start at the same time from points A and B towards each other and after crossing they take a and b sec in reaching B and A respectively, then:
   (A's speed) : (B's speed) = $(\sqrt{b} : \sqrt{a})$

EXERCISES

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

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

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:

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?

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

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?

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

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

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?

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?

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?

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

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

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?

15) A train travelling at a speed of 75 mph enters a tunnel 3 miles long. The train is 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?

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

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?

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

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?

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?

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.

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

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

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

120 metres, in what time (in seconds) will they cross each other travelling in opposite direction?

speed of the second train is

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

TIME AND DISTANCE

IMPORTANT FORMULAS

1. *Speed, Time and Distance:*

$$\text{Speed} = \left(\frac{\text{Distance}}{\text{Time}}\right), \quad \text{Time} = \left(\frac{\text{Distance}}{\text{Speed}}\right), \quad \text{Distance} = (\text{Speed} \times \text{Time}).$$

2. *km/hr to m/sec conversion:*

$$x \text{ km/hr} = \left(x \times \frac{5}{18}\right) \text{m/sec}.$$

3. *m/sec to km/hr conversion:*

$$x \text{ m/sec} = \left(x \times \frac{18}{5}\right) \text{km/hr}.$$

4. If the ratio of the speeds of A and B is $a : b$, then the ratio of the times taken by then to cover the same distance is

$$\frac{1}{a} : \frac{1}{b} \text{ or } b : a.$$

5. Suppose a man covers a certain distance at x km/hr and an equal distance at y km/hr. Then, the average speed during the whole journey is

$$\frac{2xy}{x+y} \text{ km/hr}.$$

EXERCISES

1) 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

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

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

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

5) A car travelling with 5/7 of its actual speed covers 42 km in 1 hr 40 min 48 sec. Find the actual speed of the car.

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

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.?

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

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

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

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

12) An aeroplane covers a certain distance at a speed of 240 kmph in 5 hours. To cover the same distance in 1(2/3) hours, it must travel at a speed of

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

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:

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?

TIME AND WORK

IMPORTANT FORMULAS

1. *Work from Days:*

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

2. *Days from Work:*

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

3. *Ratio:*

If A is thrice as good a workman as B, then:

Ratio of work done by A and B = 3: 1.

Ratio of times taken by A and B to finish a work = 1: 3.

EXERCISES

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

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?

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

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?

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?

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?

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?

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?

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?

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?

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?

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?

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?

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

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

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

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

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?

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 in

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?

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

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

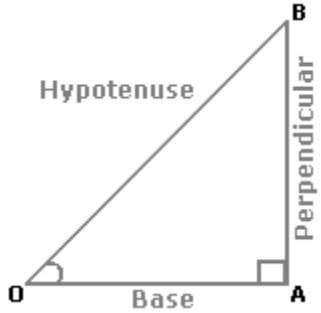
23) A, B and C can do a piece of work in 20, 30 and 60 days respectively. In how many days can A do the work if he is assisted by B and C on every third day?

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

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?

HEIGHT AND DISTANCE

1. *Trigonometry*:
In a right angled $\triangle$OAB, where $\angle$BOA = θ,



i. $\sin\theta = \frac{\text{Perpendicular}}{\text{Hypotenuse}} = \frac{AB}{OB}$

ii. $\cos\theta = \frac{\text{Base}}{\text{Hypotenuse}} = \frac{OA}{OB}$

iii. $\tan\theta = \frac{\text{Perpendicular}}{\text{Base}} = \frac{AB}{OA}$

iv. $\text{cosec}\,\theta = \frac{1}{\sin\theta} = \frac{OB}{AB}$

v. $\sec\theta = \frac{1}{\cos\theta} = \frac{OB}{OA}$

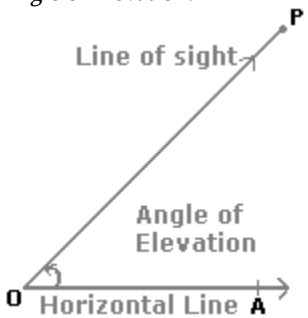
vi. $\cot\theta = \frac{1}{\tan\theta} = \frac{OA}{AB}$

2. *Trigonometrical Identities:*
   i. $\sin^2\theta + \cos^2\theta = 1$.
   ii. $1 + \tan^2\theta = \sec^2\theta$.
   iii. $1 + \cot^2\theta = \text{cosec}^2\theta$.

3. *Values of T-ratios:*

θ	0°	$(\pi/6)$ 30°	$(\pi/4)$ 45°	$(\pi/3)$ 60°	$(\pi/2)$ 90°
$\sin\theta$	0	$\frac{1}{2}$	$1/\sqrt{2}$	$\sqrt{3}/2$	1
$\cos\theta$	1	$\sqrt{3}/2$	$1/\sqrt{2}$	$\frac{1}{2}$	0
$\tan\theta$	0	$1/\sqrt{3}$	1	$\sqrt{3}$	not defined

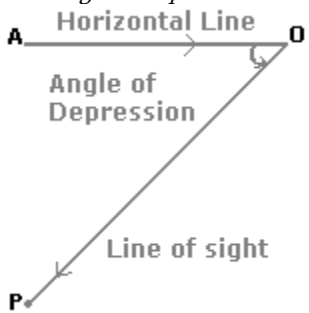
4. *Angle of Elevation:*



Suppose a man from a point O looks up at an object P, placed above the level of his eye. Then, the angle which the line of sight makes with the horizontal through O, is called the *anlge of elevation* of P as seen from O.

$\therefore$ Angle of elevation of P from O = $\angle$AOP.

5. *Angle of Depression:*



Suppose a man from a point O looks down at an object P, placed below the level of his eye, then the angle which the line of sight makes with the horizontal through O, is called the *angle of depression* of P as seen from O.

EXERCISES

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 30º and 45º respectively. If the lighthouse is 100 m high, the distance between the two ships is:

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

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

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 30º. The heights of the tower is:

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

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:

PIPES AND CISTERN

IMPORTANT FORMULAS

1. Inlet:

   A pipe connected with a tank or a cistern or a reservoir, that fills it, is known as an inlet.

   Outlet:

   A pipe connected with a tank or cistern or reservoir, emptying it, is known as an outlet.
2. If a pipe can fill a tank in x hours, then:

   part filled in 1 hour $= \frac{1}{x}$.
3. If a pipe can empty a tank in y hours, then:

   part emptied in 1 hour $= \frac{1}{y}$.
4. If a pipe can fill a tank in x hours and another pipe can empty the full tank in y hours (where y > x), then on opening both the pipes, then

   the net part filled in 1 hour $= \left(\frac{1}{x} - \frac{1}{y}\right)$.
5. If a pipe can fill a tank in x hours and another pipe can empty the full tank in y hours (where y > x), then on opening both the pipes, then

   the net part emptied in 1 hour $= \left(\frac{1}{y} - \frac{1}{x}\right)$.

EXERCISES

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

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?

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?

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?

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?

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

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?

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?

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

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

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?

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

13) A pump can fill a tank with water in 2 hours. Because of la leak, it took 2 1/3 hours to fill the tank. The leak can drain all the water of the tank in

14) Two pipes A and B can fill a cistern in 37 1/2 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

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

BOATS AND STREAMS

IMPORTANT FORMULAS

1. Downstream/Upstream:
   In water, the direction along the stream is called downstream. And, the direction against the stream is called upstream.
2. If the speed of a boat in still water is u km/hr and the speed of the stream is v km/hr, then:
   Speed downstream = (u + v) km/hr.
   Speed upstream = (u - v) km/hr.
3. If the speed downstream is a km/hr and the speed upstream is b km/hr, then:
   Speed in still water $=\frac{1}{2}(a + b)$ km/hr.
   Rate of stream $=\frac{1}{2}(a - b)$ km/hr.

EXERCISES

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?

2) The speed of a boat in still water in 15 km/hr and the rate of current is 3 km/hr. The distance travelled downstream in 12 minutes is

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

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?

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?

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?

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

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

9) A man takes twice as long to row a distance against the stream as to row the same distance in favor of the stream. The ratio of the speed of the boat (in still water) and the stream is

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

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.

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:

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?

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

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

RACES AND GAMES

IMPORTANT FORMULAS

1. Races: A contest of speed in running, riding, driving, sailing or rowing is called a race.
2. Race Course: The ground or path on which contests are made is called a race course.
3. Starting Point: The point from which a race begins is known as a starting point.
4. Winning Point or Goal: The point set to bound a race is called a winning point or a goal.
5. Winner: The person who first reaches the winning point is called a winner.
6. Dead Heat Race: If all the persons contesting a race reach the goal exactly at the same time, the race is said to be dead heat race.
7. Start: Suppose A and B are two contestants in a race. If before the start of the race, A is at the starting point and B is ahead of A by 12 metres, then we say that 'A gives B, a start of 12 metres.
   To cover a race of 100 metres in this case, A will have to cover 100 metres while B will have to cover only (100 - 12) = 88 metres.
   In a 100 race, 'A can give B 12 m' or 'A can give B a start of 12 m' or 'A beats B by 12 m' means that while A runs 100 m, B runs (100 - 12) = 88 m.

8. Games: 'A game of 100, means that the person among the contestants who scores 100 points first is the winner'.
   If A scores 100 points while B scores only 80 points, then we say that 'A can give B 20 points.

EXERCISES

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

2) In 100 m race, A covers the distance in 36 seconds and B in 45 seconds. In this race A beats B by

3) In a game of 100 points, A can give B 20 points and C 28 points. Then, B can give C

4) In a 200 metres race A beats B by 35 m or 7 seconds. A's time over the course is

5) A can run 22.5 m while B runs 25 m. In a kilometre race B beats A by

6) In a 300 m race A beats B by 22.5 m or 6 seconds. B's time over the course is

7) A runs 1 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?

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

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?

10) In a 10 m race, A beats B by 10 m and C by 13 m. In a race of 180 m, B will beat C by:

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:

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:

13) In a 100 m race, A can give B 10 m and C 28 m. In the same race B can give C:

PERCENTAGE

IMPORTANT FORMULAS

1. Concept of Percentage:
   By a certain percent, we mean that many hundredths.
   Thus, x percent means x hundredths, written as x%.

   To express x% as a fraction: We have, $x\% = \frac{x}{100}$.

   Thus, $20\% = \frac{20}{100} = \frac{1}{5}$.

   To express $\frac{a}{b}$ as a percent: We have, $\frac{a}{b} = \left(\frac{a}{b} \times 100\right)\%$.

   Thus, $\frac{1}{4} = \left(\frac{1}{4} \times 100\right)\% = 25\%$.

2. Percentage Increase/Decrease:
   If the price of a commodity increases by R%, then the reduction in consumption so as not to increase the expenditure is:
   $$\left[\frac{R}{(100 + R)} \times 100\right]\%$$
   If the price of a commodity decreases by R%, then the increase in consumption so as not to decrease the expenditure is:
   $$\left[\frac{R}{(100 - R)} \times 100\right]\%$$

3. Results on Population:
   Let the population of a town be P now and suppose it increases at the rate of R% per annum, then:

   1. Population after n years = $P\left(1 + \frac{R}{100}\right)^n$

   2. Population n years ago = $\frac{P}{\left(1 + \frac{R}{100}\right)^n}$

4. Results on Depreciation:
   Let the present value of a machine be P. Suppose it depreciates at the rate of R% per annum. Then:

   1. Value of the machine after n years = $P\left(1 - \frac{R}{100}\right)^n$

   2. Value of the machine n years ago = $\frac{P}{\left(1 - \frac{R}{100}\right)^n}$

   3. If A is R% more than B, then B is less than A by $\left[\frac{R}{(100 + R)} \times 100\right]\%$.

   4. If A is R% less than B, then B is more than A by $\left[\frac{R}{(100 - R)} \times 100\right]\%$.

EXERCISES

1) If 20% of a = b, then b% of 20 is the same as

2) A student multiplied a number by 3/5 instead of 5/3. What is the percentage error in the calculation?

3) In a certain school, 20% of students are below 8 years of age. The number of students above 8 years of age is 2/3 of the number of students of 8 years of age which is 48. What is the total number of students in the school?

4) 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.

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

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?

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?

8) Gauri went to the stationers and bought things worth Rs. 25, out of which 30 paisa went on sales tax on taxable purchases. If the tax rate was 6%, then what was the cost of the tax free items?

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.

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

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?

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:

13) A fruit seller had some apples. He sells 40% apples and still has 420 apples. Originally, he had

14) What percentages of numbers from 1 to 70 have 1 or 9 in the unit's digit?

15) If A = x% of y and B = y% of x, then which of the following is true?

A. A is smaller than B. B. A is greater than B

C. Relationship cannot be determined. D. If x is smaller than y, then A is greater than B.

E. None of these

AVERAGE

IMPORTANT FORMULAS

1. Average:

   $$\text{Average} = \left(\frac{\text{Sum of observations}}{\text{Number of observations}}\right)$$

2. Average Speed:

   Suppose a man covers a certain distance at x kmph and an equal distance at y kmph.

   Then, the average speed during the whole journey is $\left(\frac{2xy}{x+y}\right)$ kmph.

EXERCISES

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?

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

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

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?

5) In Arun's opinion, his weight is greater than 65 kg but less than 72 kg. His brother doest 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?

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

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.

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

9) If the average marks of three batches of 55,

10) A pupil's marks were wrongly entered

60 and 45 students respectively is 50, 55, 60, then the average marks of all the students is

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

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?

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?

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?

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?

15) The average of 20 numbers is zero. Of them, at the most, how many may be greater than zero?

PROFIT AND LOSS

IMPORTANT FORMULAS

Cost Price:

The price, at which an article is purchased, is called its cost price, abbreviated as C.P.

Selling Price:

The price, at which an article is sold, is called its selling prices, abbreviated as S.P.

Profit or Gain:

If S.P. is greater than C.P., the seller is said to have a profit or gain.

Loss:

If S.P. is less than C.P., the seller is said to have incurred a loss.

1. Gain = (S.P.) - (C.P.)
2. Loss = (C.P.) - (S.P.)
3. Loss or gain is always reckoned on C.P.
4. Gain Percentage: (Gain %)

   $$\text{Gain \%} = \frac{\text{Gain} \times 100}{\text{C.P.}}$$

5. Loss Percentage: (Loss %)

   $$\text{Loss \%} = \frac{\text{Loss} \times 100}{\text{C.P.}}$$

6. Selling Price: (S.P.)

   $$\text{SP} = \frac{(100 + \text{Gain \%})}{100} \times \text{C.P}$$

7. Selling Price: (S.P.)

   $$\text{SP} = \frac{(100 - \text{Loss \%})}{100} \times \text{C.P.}$$

8. Cost Price: (C.P.)

   $$\text{C.P.} = \frac{100}{(100 + \text{Gain \%})} \times \text{S.P.}$$

9. Cost Price: (C.P.)

   $$\text{C.P.} = \frac{100}{(100 - \text{Loss \%})} \times \text{S.P.}$$

10. If an article is sold at a gain of say 35%, then S.P. = 135% of C.P.
11. If an article is sold at a loss of say, 35% then S.P. = 65% of C.P.
12. When a person sells two similar items, one at a gain of say x%, and the other at a loss of x%, then the seller always incurs a loss given by:

    $$\text{Loss \%} = \left(\frac{\text{Common Loss and Gain \%}}{10} \right)^2 = \left(\frac{x}{10} \right)^2$$

13. If a trader professes to sell his goods at cost price, but uses false weights, then

    $$\text{Gain \%} = \left[\frac{\text{Error}}{(\text{True Value}) - (\text{Error})} \times 100 \right] \%.$$

EXERCISES

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?

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?

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?

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?

5) Some articles were bought at 6 articles for Rs. 5 and sold at 5 articles for Rs. 6. Gain percent is

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

7) When a plot is sold for Rs. 18,700, the owner loses 15%. At what price must that plot

8) 100 oranges are bought at the rate of Rs. 350 and sold at the rate of Rs. 48 per dozen.

be sold in order to gain 15%?

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

11) Alfred buys an old scooter for Rs. 4700 and spends Rs. 800 on its repairs. If he sells the scooter for Rs. 5800, his gain percent is:

13) If selling price is doubled, the profit triples. Find the profit percent.

15) A vendor bought toffees at 6 for a rupee. How many for a rupee must he sell to gain 20%?

The percentage of profit or loss is

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

12) The cost price of 20 articles is the same as the selling price of x articles. If the profit is 25%, then the value of x is:

14) In a certain store, the profit is 320% of the cost. If the cost increases by 25% but the selling price remains constant, approximately what percentage of the selling price is the profit?

PARTNERSHIP

IMPORTANT FORMULAS

1. Partnership:
   When two or more than two persons run a business jointly, they are called **partners** and the deal is known as **partnership**. If a number of partners have invested in a business and it has a profit, then
   Share Of Partner = (Total_Profit × Part_Share / Total_Share)
2. Ratio of Divisions of Gains:
   I. When investments of all the partners are for the same time, the gain or loss is distributed among the partners in the ratio of their investments.
   Suppose A and B invest Rs. x and Rs. y respectively for a year in a business, then at the end of the year:
   (A's share of profit) : (B's share of profit) = x : y.
   II. When investments are for different time periods, then equivalent capitals are calculated for a unit of time by taking (capital x number of units of time).
   Now gain or loss is divided in the ratio of these capitals.
   Suppose A invests Rs. x for p months and B invests Rs. y for q months then,
   (A's share of profit) : (B's share of profit)= xp : yq.
3. Working and Sleeping Partners:
   A partner who manages the business is known as a **working partner** and the one who simply invests the money is a **sleeping partner**.

EXERCISES

1) A starts business with Rs. 3500 and after 5 months, B joins with A as his partner. After a year, the profit is divided in the ratio 2 : 3. What is B's contribution in the capital?

2) 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?

3) A and B entered into partnership with capitals in the ratio 4 : 5. After 3 months, A withdrew ¼ of his capital and B withdrew 1/5 of his capital. The gain at the end of 10 months was Rs. 760. A's share in this profit is

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?

5) Two friends P and Q started a business investing in the ration 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?

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?

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?

8) 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?

9) 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

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?

after Aman started the business?

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:

12) 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:

13) 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.

14) 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:

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?

TRUE DISCOUNT

IMPORTANT CONCEPTS

Suppose a man has to pay Rs. 156 after 4 years and the rate of interest is 14% per annum. Clearly, Rs. 100 at 14% will amount to R. 156 in 4 years. So, the payment of Rs. now will clear off the debt of Rs. 156 due 4 years hence. We say that:

Sum due = Rs. 156 due 4 years hence;

Present Worth (P.W.) = Rs. 100;

True Discount (T.D.) = Rs. (156 - 100) = Rs. 56 = (Sum due) - (P.W.)

We define: *T.D. = Interest on P.W.; Amount = (P.W.) + (T.D.)*

Interest is reckoned on P.W. and true discount is reckoned on the amount.

IMPORTANT FORMULAS

Let rate = R% per annum and Time = T years. Then,

1. P.W. = $\dfrac{100 \times \text{Amount}}{100 + (R \times T)} = \dfrac{100 \times \text{T.D.}}{R \times T}$

2. T.D. = $\dfrac{(\text{P.W.}) \times R \times T}{100} = \dfrac{\text{Amount} \times R \times T}{100 + (R \times T)}$

3. Sum = $\dfrac{(\text{S.I.}) \times (\text{T.D.})}{(\text{S.I.}) - (\text{T.D.})}$

4. (S.I.) - (T.D.) = S.I. on T.D.

5. When the sum is put at compound interest, then P.W. = $\dfrac{\text{Amount}}{\left(1 + \dfrac{R}{100}\right)^T}$

EXERCISES

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

2) The true discount on a bill due 9 months hence at 16% per annum is Rs. 189. The amount of the bill is

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

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

5) The present worth of Rs. 2310 due 2 years hence, the rate of interest being 15% per annum, is

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?

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

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

9) The present worth of Rs. 1404 due in two equal half-yearly installments at 8% per annum simple interest is

10) If the true discount on s sum due 2 years hence at 14% per annum be Rs. 168, the sum due is

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

12) 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?

13) 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

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

due at the end of double the time is:

15) The true discount on Rs. 2562 due 4 months hence is Rs. 122. The rate percent is:

SIMPLE INTEREST

IMPORTANT FORMULAS

1. Principal:
   The money borrowed or lent out for a certain period is called the **principal** or the **sum**.
2. Interest:
   Extra money paid for using other's money is called **interest**.
3. Simple Interest (S.I.):
   If the interest on a sum borrowed for certain period is reckoned uniformly, then it is called **simple interest**.
   Let Principal = P, Rate = R% per annum (p.a.) and Time = T years. Then

   (i). Simple Intereest = $\left(\frac{P \times R \times T}{100}\right)$

   (ii). P = $\left(\frac{100 \times S.I.}{R \times T}\right)$; R = $\left(\frac{100 \times S.I.}{P \times T}\right)$ and T = $\left(\frac{100 \times S.I.}{P \times R}\right)$

EXERCISES

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?

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

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

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

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?

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

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

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?

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?

10) A person borrows Rs. 5000 for 2 years at 4% p.a. simple interest. He immediately lends it to another person at 6 p.a for 2 years. Find his gain in the transaction per year.

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:

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?

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?

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?

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?

COMPOUND INTEREST

IMPORTANT FORMULAS

1. Let Principal = P, Rate = R% per annum, Time = n years.
2. When interest is compound Annually:
   Amount = $P\left(1 + \frac{R}{100}\right)^n$
3. When interest is compounded Half-yearly:
   Amount = $P\left[1 + \frac{(R/2)}{100}\right]^{2n}$
4. When interest is compounded Quarterly:

Amount = $P\left[1+\frac{(R/4)}{100}\right]^{4n}$

5. When interest is compounded Annually but time is in fraction, say 3 2/5 years.

Amount = $P\left(1+\frac{R}{100}\right)^{3}\times\left(1+\frac{2R/5}{100}\right)$

6. When Rates are different for different years, say R_1%, R_2%, R_3% for 1st, 2nd and 3rd year respectively.

Then, Amount = $P\left(1+\frac{R_1}{100}\right)\left(1+\frac{R_2}{100}\right)\left(1+\frac{R_3}{100}\right)$

7. Present worth of Rs. x due n years hence is given by:

Present Worth = $\frac{x}{\left(1+\frac{R}{100}\right)^{n}}$

EXERCISES

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.?

2) At what rate of compound interest per annum will a sum of Rs. 1200 become Rs. 1348.32 in 2 years?

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

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?

5) The effective annual rate of interest corresponding to a nominal rate of 6% per annum payable half-yearly is

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

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?

8) The difference between simple interest and compound on Rs. 1200 for one year at 10% per annum reckoned half-yearly is

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?

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

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:

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:

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?

14) What is the difference between the compound interests on Rs. 5000 for 1 ½ years at 4% per annum compounded yearly and half-yearly?

15) The compound interest on Rs. 30,000 at 7% per annum is Rs. 4347. The period is:

RATIO AND PROPORTION

IMPORTANT FORMULAS

1. Ratio:

   The ratio of two quantities a and b in the same units, is the fraction (a/b) and we write it as a : b.

   In the ratio a : b, we call a as the first term or antecedent and b, the second term or consequent.

Eg. The ratio 5 : 9 represents $\frac{5}{9}$ With antecedent = 5, consequent = 9.

Rule: The multiplication or division of each term of a ratio by the same non-zero number does not affect the ratio.

Eg. 4 : 5 = 8 : 10 = 12 : 15. Also, 4 : 6 = 2 : 3.

2. Proportion:

   The equality of two ratios is called proportion.

   If a : b = c : d, we write a : b :: c : d and we say that a, b, c, d are in proportion.

   Here a and d are called extremes, while b and c are called mean terms.

   Product of means = Product of extremes.

   Thus, a : b :: c : d $\Leftrightarrow$ (b x c) = (a x d).

3. Fourth Proportional:

If a : b = c : d, then d is called the fourth proportional to a, b, c.

Third Proportional:

a : b = c : d, then c is called the third proportion to a and b.

Mean Proportional:

Mean proportional between a and b is √(ab).

4. Comparison of Ratios:

We say that (a : b) > (c : d) $\Leftrightarrow$ $\frac{a}{b} > \frac{c}{d}$.

5. Compounded Ratio:

The compounded ratio of the ratios: (a : b), (c : d), (e : f) is (ace : bdf).

6. Duplicate Ratios:

Duplicate ratio of (a : b) is $(a^2 : b^2)$.

Sub-duplicate ratio of (a : b) is $(\sqrt{a} : \sqrt{b})$.

Triplicate ratio of (a : b) is $(a^3 : b^3)$.

Sub-triplicate ratio of (a : b) is $(a^{1/3} : b^{1/3})$.

If $\frac{a}{b} = \frac{c}{d}$, then $\frac{a+b}{a-b} = \frac{c+d}{c-d}$. [componendo and dividendo]

7. Variations:

We say that x is directly proportional to y, if x = ky for some constant k and we write, $x \propto y$.

We say that x is inversely proportional to y, if xy = k for some constant k and we write, $x \propto \frac{1}{y}$

EXERCISES

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?

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?

3) If 0.75 : x :: 5 : 8, then x is equal to:

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

5) If Rs. 782 be divided into three parts, proportional to 1/2, 2/3, 3/4, then the first part is

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?

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?

8) The fourth proportional to 5, 8, 15 is

9) Two numbers 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

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?

11) A and B together have Rs. 1210. If 4/15 of A's amount is equal to 2/5 of B's amount, how much amount does B have?

12) Two numbers are respectively 20% and 50% more than a third number. The ratio of the two numbers is:

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?

14) 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:

15) 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?

ALLIGATION OR MIXTURE

IMPORTANT FORMULAS

1. *Alligation:*

   It is the rule that enables us to find the ratio in which two or more ingredients at the given price must be mixed to produce a mixture of desired price. Alligation

2. *Mean Price:*

   The cost of a unit quantity of the mixture is called the mean price.

3. *Rule of Alligation:*

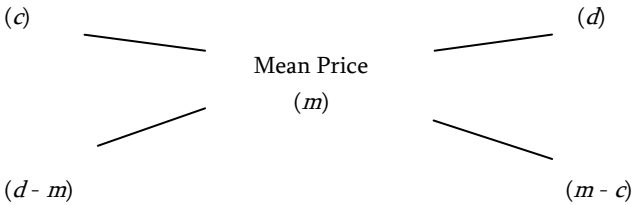
   If two ingredients are mixed, then

$$\left(\frac{\text{Quantity of cheaper}}{\text{Quantity of dearer}}\right) = \left(\frac{\text{C.P. of dearer - Mean Price}}{\text{Mean price - C.P. of cheaper}}\right)$$

   We present as under:

   C.P. of a unit quantity of cheaper = (c)

   C.P. of a unit quantity of dearer = (d)



(Cheaper quantity) : (Dearer quantity) = $(d - m) : (m - c)$.

4. Suppose a container contains x of liquid from which y units are taken out and replaced by water.

After n operations, the quantity of pure liquid = $\left[x \left(1 - \frac{y}{x} \right)^n \right]$ units.

EXERCISES

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?

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?

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?

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

5) In what ratio must water be mixed with milk to gain 162/3% on selling the mixture at cost price?

6) Find the ratio in which rice at Rs. 7.20 a kg is mixed with rice at Rs. 5.70 a kg to produce a mixture worth Rs. 6.30 a kg.

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%?

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

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?

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

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?

12) Tea worth Rs. 126 per kg and Rs. 135 per kg is 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

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?

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:

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?

PROBLEMS ON AGES

IMPORTANT FORMULAS

Odd Days:

We are supposed to find the day of the week on a given date.

For this, we use the concept of 'odd days'.

In a given period, the number of days more than the complete weeks are called odd days.

Leap Year:

(i). Every year divisible by 4 is a leap year, if it is not a century.

(ii). Every 4th century is a leap year and no other century is a leap year.

Note: A leap year has 366 days.

Examples:

i. Each of the years 1948, 2004, 1676 etc. is a leap year.
ii. Each of the years 400, 800, 1200, 1600, 2000 etc. is a leap year.
iii. None of the years 2001, 2002, 2003, 2005, 1800, 2100 is a leap year.

Ordinary Year:

The year which is not a leap year is called an ordinary years. An ordinary year has 365 days.

Counting of Odd Days:

1. 1 ordinary year = 365 days = (52 weeks + 1 day.)
1 ordinary year has 1 odd day.
2. 1 leap year = 366 days = (52 weeks + 2 days)
1 leap year has 2 odd days.
3. 100 years = 76 ordinary years + 24 leap years
= (76 x 1 + 24 x 2) odd days = 124 odd days.
= (17 weeks + days) 5 odd days.
Number of odd days in 100 years = 5.
Number of odd days in 200 years = (5 x 2) 3 odd days.
Number of odd days in 300 years = (5 x 3) 1 odd day.
Number of odd days in 400 years = (5 x 4 + 1) 0 odd day.
Similarly, each one of 800 years, 1200 years, 1600 years, 2000 years etc. has 0 odd days.

Day of the Week Related to Odd Days:

No. of days:	0	1	2	3	4	5	6
Day:	Sun.	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.

EXERCISES

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?

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

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?

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

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?

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

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).

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?

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?

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?

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

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?

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?

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?

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:

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?

CALENDAR

IMPORTANT FORMULAS

1. Odd Days:
   We are supposed to find the day of the week on a given date.
   For this, we use the concept of 'odd days'.
   In a given period, the number of days more than the complete weeks are called odd days.
2. Leap Year:
   (i). Every year divisible by 4 is a leap year, if it is not a century.
   (ii). Every 4th century is a leap year and no other century is a leap year.
   Note: A leap year has 366 days.
   Examples:
   i. Each of the years 1948, 2004, 1676 etc. is a leap year.
   ii. Each of the years 400, 800, 1200, 1600, 2000 etc. is a leap year.
   iii. None of the years 2001, 2002, 2003, 2005, 1800, 2100 is a leap year.
3. Ordinary Year:
   The year which is not a leap year is called an ordinary years. An ordinary year has 365 days.
4. Counting of Odd Days:
   1. 1 ordinary year = 365 days = (52 weeks + 1 day.)
      ∴ 1 ordinary year has 1 odd day.

2. 1 leap year = 366 days = (52 weeks + 2 days)
   ∴ 1 leap year has 2 odd days.
3. 100 years = 76 ordinary years + 24 leap years
   = (76 x 1 + 24 x 2) odd days = 124 odd days.
   = (17 weeks + days) ≡ 5 odd days.
   ∴ Number of odd days in 100 years = 5.
   Number of odd days in 200 years = (5 x 2) ≡ 3 odd days.
   Number of odd days in 300 years = (5 x 3) ≡ 1 odd day.
   Number of odd days in 400 years = (5 x 4 + 1) ≡ 0 odd day.
   Similarly, each one of 800 years, 1200 years, 1600 years, 2000 years etc. has 0 odd days.

Day of the Week Related to Odd Days:

No. of days:	0	1	2	3	4	5	6
Day:	Sun.	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.

EXERCISES

1) If 6th March, 2005 is Monday, what was the day of the week on 6th March, 2004?

2) On what dates of April, 2001 did Wednesday fall?

3) How many days are there in *x* weeks *x* days?

4) The last day of a century cannot be

5) On 8th Feb, 2005 it was Tuesday. What was the day of the week on 8th Feb, 2004?

6) The calendar for the year 2007 will be the same for the year

7) Which of the following is not a leap year?

8) On 8th Dec, 2007 Saturday falls. What day of the week was it on 8th Dec, 2006?

9) January 1, 2008 is Tuesday. What day of the week lies on Jan 1, 2009?

10) January 1, 2007 was Monday. What day of the week lies on Jan. 1, 2008?

11) Today is Monday. After 61 days, it will be

12) What will be the day of the week 15th August, 2010?

13) What was the day of the week on 17th June, 1998?

14) It was Sunday on Jan 1, 2006. What was the day of the week Jan 1, 2010?

15) What was the day of the week on 28th May, 2006?

CLOCK

IMPORTANT FORMULAS

1. Minute Spaces:
   The face or dial of watch is a circle whose circumference is divided into 60 equal parts, called minute spaces.
   Hour Hand and Minute Hand:
   A clock has two hands, the smaller one is called the hour hand or short hand while the larger one is called minute hand or long hand.
2.
   i. In 60 minutes, the minute hand gains 55 minutes on the hour on the hour hand.
   ii. In every hour, both the hands coincide once.
   iii. The hands are in the same straight line when they are coincident or opposite to each other.
   iv. When the two hands are at right angles, they are 15 minute spaces apart.
   v. When the hands are in opposite directions, they are 30 minute spaces apart.
   vi. Angle traced by hour hand in 12 hrs = 360°
   vii. Angle traced by minute hand in 60 min. = 360°.
   viii. If a watch or a clock indicates 8.15, when the correct time is 8, it is said to be 15 minutes too fast.
   ix. On the other hand, if it indicates 7.45, when the correct time is 8, it is said to be 15 minutes too slow.

EXERCISES

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?

2) At what time between 5.30 and 6 will the hands of a clock be at right angles?

3) The angle between the minute hand and the hour hand of a clock when the time is 4.20, is

4) At what angle the hands of a clock are inclined at 15 minutes past 5?

5) At 3.40, the hour hand and the minute hand of a clock form an angle of

6) How many times are the hands of a clock at right angle in a day?

7) The angle between the minute hand and the hour hand of a clock when the time is 8.30, is

8) How many times in a day, are the hands of a clock in straight line but

opposite in direction?

9) At what time between 4 and 5 o'clock will the hands of a watch point in opposite directions?

10) At what time between 9 and 10 o'clock will the hands of a watch be together?

11) At what time, in minutes, between 3 o'clock and 4 o'clock, both the needles will coincide each other?

12) How many times do the hands of a clock coincide in a day?

13) How many times in a day, the hands of a clock are straight?

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?

15) How much does a watch lose per day, if its hands coincide ever 64 minutes?

16) The reflex angle between the hands of a clock at 10.25 is:

17) An accurate clock shows 8 o'clock in the morning. Through how may degrees will the hour hand rotate when the clock shows 2 o'clock in the afternoon?

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:

19) A clock is started at noon. By 10 minutes past 5, the hour hand has turned through:

PERMUTATION AND COMBINATION

IMPORTANT FORMULAS

1. Factorial Notation:

   Let n be a positive integer. Then, factorial n, denoted n! is defined as:

   $n! = n(n - 1)(n - 2) \ldots 3.2.1.$

   Examples:

   i. We define $0! = 1$.

   ii. $4! = (4 \times 3 \times 2 \times 1) = 24$.

   iii. $5! = (5 \times 4 \times 3 \times 2 \times 1) = 120$.

2. Permutations:

   The different arrangements of a given number of things by taking some or all at a time, are called permutations.

   Examples:

   i. All permutations (or arrangements) made with the letters a, b, c by taking two at a time are (ab, ba, ac, ca, bc, cb).

   ii. All permutations made with the letters a, b, c taking all at a time are: (abc, acb, bac, bca, cab, cba)

3. Number of Permutations:

   Number of all permutations of n things, taken r at a time, is given by:

   $$^nP_r = n(n - 1)(n - 2) \ldots (n - r + 1) = \frac{n!}{(n - r)!}$$

   Examples:

   i. $^6P_2 = (6 \times 5) = 30$.

   ii. $^7P_3 = (7 \times 6 \times 5) = 210$.

   iii. Cor. number of all permutations of n things, taken all at a time = n!.

4. An Important Result:

   If there are n subjects of which p_1 are alike of one kind; p_2 are alike of another kind; p_3 are alike of third kind and so on and p_r are alike of r^{th} kind, such that $(p_1 + p_2 + \ldots p_r) = n$.

   Then, number of permutations of these n objects is $= \frac{n!}{(p_1!).(p_2)!.....(p_r!)}$

5. Combinations:

   Each of the different groups or selections which can be formed by taking some or all of a number of objects is called a combination.

   Examples:

   1. Suppose we want to select two out of three boys A, B, C. Then, possible selections are AB, BC and CA.

      Note: AB and BA represent the same selection.

   2. All the combinations formed by a, b, c taking ab, bc, ca.

   3. The only combination that can be formed of three letters a, b, c taken all at a time is abc.

   4. Various groups of 2 out of four persons A, B, C, D are:

      AB, AC, AD, BC, BD, CD.

   5. Note that ab ba are two different permutations but they represent the same combination.

   Number of Combinations:

   The number of all combinations of n things, taken r at a time is:

   $$^nC_r = \frac{n!}{(r!)(n - r!)} = \frac{n(n - 1)(n - 2) \ldots \text{to r factors}}{r!} .$$

   Note:

i. ${}^{n}C_{n} = 1$ and ${}^{n}C_{0} = 1$.

ii. ${}^{n}C_{r} = {}^{n}C_{(n-r)}$

Examples:

i. ${}^{11}C_{4} = \dfrac{(11 \times 10 \times 9 \times 8)}{(4 \times 3 \times 2 \times 1)} = 330.$

ii. ${}^{16}C_{13} = {}^{16}C_{(16-13)} = {}^{16}C_{3} = \dfrac{16 \times 15 \times 14}{3!} = \dfrac{16 \times 15 \times 14}{3 \times 2 \times 1} = 560.$

EXERCISES

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?

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?

3) In how many ways a committee, consisting of 5 men and 6 women can be formed from 8 men and 10 women?

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?

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?

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?

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?

8) In how many different ways can the letters of the word 'MATHEMATICS' be arranged so that the vowels always come together?

9) In how many different ways can the letters of the word 'OPTICAL' be arranged so that the vowels always come together?

10) In how many ways can the letters of the word 'LEADER' be arranged?

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?

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?

13) In how many different ways can the letters of the word 'CORPORATION' be arranged so that the vowels always come together?

14) Out of 7 consonants and 4 vowels, how many words of 3 consonants and 2 vowels can be formed?

PROBABILITY

IMPORTANT FORMULAS

1. Experiment:

   An operation which can produce some well-defined outcomes is called an experiment.

2. Random Experiment:

   An experiment in which all possible outcomes are know and the exact output cannot be predicted in advance, is called a random experiment.

   Examples:

   i. Rolling an unbiased dice.
   ii. Tossing a fair coin.
   iii. Drawing a card from a pack of well-shuffled cards.
   iv. Picking up a ball of certain color from a bag containing balls of different colors.

   Details:

   i. When we throw a coin, then either a Head (H) or a Tail (T) appears.
   ii. A dice is a solid cube, having 6 faces, marked 1, 2, 3, 4, 5, 6 respectively. When we throw a die, the outcome is the number that appears on its upper face.
   iii. A pack of cards has 52 cards.
   It has 13 cards of each suit, name Spades, Clubs, Hearts and Diamonds.
   Cards of spades and clubs are black cards.
   Cards of hearts and diamonds are red cards.
   There are 4 honors of each unit.
   There are Kings, Queens and Jacks. These are all called face cards.

3. Sample Space:

   When we perform an experiment, then the set S of all possible outcomes is called the sample space.

   Examples:

   1. In tossing a coin, S = {H, T}
   2. If two coins are tossed, the S = {HH, HT, TH, TT}.
   3. In rolling a dice, we have, S = {1, 2, 3, 4, 5, 6}.

4. Event:

   Any subset of a sample space is called an event.

5. Probability of Occurrence of an Event:

   Let S be the sample and let E be an event.

   Then, E $\subseteq$ S.

$\therefore$ $P(E) = \frac{n(E)}{n(S)}$.

6. Results on Probability:

$P(S) = 1$

$0 \leq P(E) \leq 1$

$P(\phi) = 0$

For any events A and B we have : $P(A \cup B) = P(A) + P(B) - P(A \cap B)$

If $\overline{A}$ denotes (not-A), then $P(\overline{A}) = 1 - P(A)$.

EXERCISES

1) Two dice are thrown simultaneously. What is the probability of getting two numbers whose product is even?

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

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?

4) From a pack of 52 cards, two cards are drawn together at random. What is the probability of both the cards being kings?

5) Two dice are tossed. The probability that the total score is a prime number is

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:

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

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

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?

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?

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?

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?

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?

14) What is the probability of getting a sum 9 from two throws of a dice?

15) Three unbiased coins are tossed. What is the probability of getting at most two heads?

SQUARE ROOT AND CUBE ROOT

IMPORTANT FORMULAS

1. Square Root:

   If $x^2 = y$, we say that the square root of y is x and we write $\sqrt{y} = x$.

   Thus, $\sqrt{4} = 2$, $\sqrt{9} = 3$, $\sqrt{196} = 14$.

2. Cube Root:

   The cube root of a given number x is the number whose cube is x.

   We, denote the cube root of x by x.

   Thus, $3\sqrt{8} = 3\sqrt{(2 \times 2 \times 2)} = 2$, $3\sqrt{343} = 3\sqrt{(7 \times 7 \times 7)} = 7$ etc.

   Note:

   1. $\sqrt{xy} = (\sqrt{x}) \times (\sqrt{y})$
   2. $\sqrt{x/y} = \frac{\sqrt{x}}{\sqrt{y}} = \frac{\sqrt{x}}{\sqrt{y}} \times \frac{\sqrt{y}}{\sqrt{y}} = \frac{\sqrt{xy}}{y}$.

EXERCISES

If $a = 0.1039$, then the value of $(\sqrt{(4a^2 - 4a + 1)}) + 3a$ is:		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:
A group of students decided to collect as many paisas from each member of group as is the number of members. If the total collection accounts to Rs. 59.29, the number of the member is the group is		$\frac{x}{\text{Sq rt}(128)} = \frac{\text{Sq rt}(162)}{x}$ What should come in place of both x in the equation
If $\sqrt{5} = 2.236$, then the value of $\frac{\sqrt{5}}{2} - \frac{10}{\sqrt{5}} + \sqrt{125}$ is equal to:		$\left(\frac{\sqrt{625}}{11} \times \frac{14}{\sqrt{25}} \times \frac{11}{\sqrt{196}}\right)$ is equal to:
$\sqrt{0.0169}$ x = 1.3		The square root of 64009 is

How many two-digit numbers satisfy this property.: The last digit (unit's digit) of the square of the two-digit number is 8 ?		$\left(\sqrt{3} - \frac{1}{\sqrt{3}}\right)^2$ simplifies to:
The cube root of .000216 is:		The least perfect square, which is divisible by each of 21, 36 and 66 is
Sq Rt (1.5625) = ?		The square root of $(7 + 3\sqrt{5})(7 - 3\sqrt{5})$ is

LOGARITHM

IMPORTANT FORMULAS

1. Logarithm:
   If a is a positive real number, other than 1 and $a^m = x$, then we write:
   $m = \log_a x$ and we say that the value of log x to the base a is m.
   Examples:
   (i). $10^3 = 1000 \Rightarrow \log_{10} 1000 = 3$.
   (ii). $3^4 = 81 \Rightarrow \log_3 81 = 4$.
   (iii). $2^{-3} = \frac{1}{8} \Rightarrow \log_2 \frac{1}{8} = -3$.
   (iv). $(.1)^2 = .01 \Rightarrow \log_{(.1)} .01 = 2$.
2. Properties of Logarithms:
   1. $\log_a (xy) = \log_a x + \log_a y$
   2. $\log_a \left(\frac{x}{y}\right) = \log_a x - \log_a y$
   3. $\log_x x = 1$
   4. $\log_a 1 = 0$
   5. $\log_a (x^n) = n(\log_a x)$
   6. $\log_a x = \frac{1}{\log_x a}$
   7. $\log_a x = \frac{\log_b x}{\log_b a} = \frac{\log x}{\log a}$.
3. Common Logarithms:
   Logarithms to the base 10 are known as common logarithms.
4. The logarithm of a number contains two parts, namely 'characteristic' and 'mantissa'.

Characteristic: The internal part of the logarithm of a number is called its characteristic.
Case I: When the number is greater than 1.
In this case, the characteristic is one less than the number of digits in the left of the decimal point in the given number.
Case II: When the number is less than 1.
In this case, the characteristic is one more than the number of zeros between the decimal point and the first significant digit of the number and it is negative.
Instead of -1, -2 etc. we write $\bar{1}$(one bar), $\bar{2}$ (two bar), etc.
Examples:-

Number	Characteristic	Number	Characteristic
654.24	2	0.6453	$\bar{1}$
26.649	1	0.06134	$\bar{2}$
8.3547	0	0.00123	$\bar{3}$

Mantissa:
The decimal part of the logarithm of a number is known is its mantissa. For mantissa, we look through log table.

EXERCISES

1) If $\log_{10} 7 = a$, then $\log_{10} \left(\frac{1}{10}\right)$ is equal to

2) If $\log_{10} 2 = 0.3010$, then $\log_2 10$ is equal to

3) If $\log_{10} 2 = 0.3010$, the value of $\log_{10} 80$ is

4) If $\log_{10} 5 + \log_{10} (5x + 1) = \log_{10} (x + 5) + 1$, then x is equal to

5) The value of $\left(\frac{1}{\log_3 60} + \frac{1}{\log_4 60} + \frac{1}{\log_5 60}\right)$ is:

6) If log 2 = 0.30103, the number of digits in 2^{64} is

7) If $\log_x \left(\frac{9}{16}\right) = -\frac{1}{2}$, then x is equal to

8) If $a^x = b^y$, then

9) If $\log_x y = 100$ and $\log_2 x = 10$, then the value of y is

10) The value of $\log_2 16$ is

7) If log 2 = 0.3010 and log 3 = 0.4771, the value of log5 512 is:

A. 2.870 B. 2.967
C. 3.876 D. 3.912

11) Which of the following statements is not correct?

A. log10 10 = 1
B. log (2 + 3) = log (2 x 3)
C. log10 1 = 0
D. log (1 + 2 + 3) = log 1 + log 2 + log 3

AREA

IMPORTANT FORMULAS

Results on Triangles:

Sum of the angles of a triangle is 180°.

The sum of any two sides of a triangle is greater than the third side.

Pythagoras Theorem:

In a right-angled triangle, (Hypotenuse)2 = (Base)2 + (Height)2.

The line joining the mid-point of a side of a triangle to the positive vertex is called the median.

The point where the three medians of a triangle meet, is called centroid. The centroid divided each of the medians in the ratio 2 : 1.

In an isosceles triangle, the altitude from the vertex bisects the base.

The median of a triangle divides it into two triangles of the same area.

The area of the triangle formed by joining the mid-points of the sides of a given triangle is one-fourth of the area of the given triangle.

Results on Quadrilaterals:

The diagonals of a parallelogram bisect each other.

Each diagonal of a parallelogram divides it into triangles of the same area.

The diagonals of a rectangle are equal and bisect each other.

The diagonals of a square are equal and bisect each other at right angles.

The diagonals of a rhombus are unequal and bisect each other at right angles.

A parallelogram and a rectangle on the same base and between the same parallels have equal area.

Of all the parallelogram of given sides, the parallelogram which is a rectangle has the greatest area.

I. 1. Area of a rectangle = (Length × Breadth).

$\therefore$ Length = $\left(\frac{\text{Area}}{\text{Breadth}}\right)$ and Breadth = $\left(\frac{\text{Area}}{\text{Length}}\right)$.

2. Perimeter of a rectangle = 2(Length + Breadth).

II. Area of a square = $(\text{side})^2 = \frac{(\text{diagonal})^2}{2}$.

III. Area of 4 walls of a room = 2 (Length + Breadth) × Height.

IV. 1. Area of a triangle = (Base × Height) / 2.

2. Area of a triangle = $\sqrt{[s(s-a)(s-b)(s-c)]}$

where a, b, c are the sides of the triangle and $s = (a + b + c) / 2$.

3. Area of an equilateral triangle = $\frac{\sqrt{3}}{4} \times (\text{side})^2$.

4. Radius of incircle of an equilateral triangle of side $a = \frac{a}{2\sqrt{3}}$.

5. Radius of circumcircle of an equilateral triangle of side $a = \frac{a}{\sqrt{3}}$.

6. Radius of incircle of a triangle of area Δ and semi-perimeter $s = \frac{\Delta}{s}$

V. 1. Area of parallelogram = (Base x Height).

2. Area of a rhombus = (Product of diagonals) / 2.

3. Area of a trapezium = [(sum of parallel sides) × (distance between them)] / 2.

VI. 1. Area of a circle = πR^2, where R is the radius.

2. Circumference of a circle = $2\pi R$.

3. Length of an arc = $\frac{2\pi R\theta}{360}$, where θ is the central angle.

4. Area of a sector = $\frac{1}{2}$(arc x R) = $\frac{\pi R^2 \theta}{360}$.

VII. 1. Circumference of a semi-circle = πR.

2. Area of semi-circle = $\frac{\pi R^2}{2}$.

EXERCISES

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?

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

3) A man walked diagonally across a square lot. Approximately, what was the percent saved by not walking along the edges?

4) The diagonal of a rectangle is 41 cm and its area is 20 sq. cm. The perimeter of the rectangle must be

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?

6) The difference between the length and breadth of a rectangle is 23 m. If its perimeter is 206 m, then its area is

7) The length of a rectangle is halved, while its breadth is tripled. What is the percentage change in area?

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?

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?

10) A tank is 25 m long, 12 m wide and 6 m deep. The cost of plastering its walls and bottom at 75 paisa per sq. m, is

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:

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?

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?

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:

15) The percentage increase in the area of a rectangle, if each of its sides is increased by 20% is:

VOLUME AND SURFACE AREA

IMPORTANT FORMULAS

1. CUBOID

   Let length = l, breadth = b and height = h units. Then

   i. Volume = $(l \times b \times h)$ cubic units.

   ii. Surface area = $2(lb + bh + lh)$ sq. units.

   iii. Diagonal = $\sqrt{(l^2 + b^2 + h^2)}$ units.

2. CUBE

   Let each edge of a cube be of length a. Then,

   i. Volume = a^3 cubic units.

   ii. Surface area = $6a^2$ sq. units.

   iii. Diagonal = $\sqrt{3}a$ units.

3. CYLINDER

   Let radius of base = r and Height (or length) = h. Then,

   i. Volume = $(\pi r^2 h)$ cubic units.

   ii. Curved surface area = $(2\pi rh)$ sq. units.

   iii. Total surface area = $2\pi r(h + r)$ sq. units.

4. CONE

   Let radius of base = r and Height = h. Then,

   i. Slant height, $l = \sqrt{(h^2 + r^2)}$ units.

   ii. Volume = $\left(\frac{1}{3}\pi r^2 h\right)$ cubic units.

   iii. Curved surface area = (πrl) sq. units.

   iv. Total surface area = $(\pi rl + \pi r^2)$ sq. units.

5. SPHERE

   Let the radius of the sphere be r. Then,

   i. Volume = $\left(\frac{4}{3}\pi r^3\right)$ cubic units.

   ii. Surface area = $(4\pi r^2)$ sq. units.

6. HEMISPHERE

   Let the radius of a hemisphere be r. Then,

   i. Volume = $\left(\frac{2}{3}\pi r^3\right)$ cubic units.

   ii. Curved surface area = $(2\pi r^2)$ sq. units.

   iii. Total surface area = $(3\pi r^2)$ sq. units.

   Note: 1 litre = 1000 cm^3.

EXERCISES

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

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

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.

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

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

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.

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

8) What is the total surface area of a right circular cone of height 14 cm and base radius 7 cm?

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?

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?

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:

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:

13) In a shower, 5 cm of rain falls. The volume of water that falls on 1.5 hectares of ground is:

14) 66 cubic centimetres of silver is drawn into a wire 1 mm in diameter. The length of the wire in metres will be:

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

GEOMETRY

STRAIGHT LINES

1. Two angles x and y are said to be complementary if $(x + y) = 90^0$
2. Two angles x and y are said to be supplementary if $(x + y) = 180^0$
3. When a straight line stands on another straight line, the two adjacent angles are supplementary. i.e. the two angles add up to 180^o.
4. When two straight lines intersect, the vertically opposite angles are equal.
5. When a pair of parallel lines is intersected by a transversal,
   i. the corresponding angles are equal
   ii. the alternate angles are equal
   iii. the interior angles are supplementary.
6. If a straight line L is parallel to another straight line L1, then it is parallel to all straight lines parallel to L1.

TRIANGLES

1. The sum of all interior angles of a triangle is 180^0.
2. Each exterior angle of a triangle is equal to the sum of the opposite interior angles.
3. The sum of any two sides of a triangle is always greater than the third side.
4. The line joining the midpoints of any two sides of a triangle is parallel to the third side and half its length. [This is known as *midpoint theorem*]
5. A triangle with any two sides equal is called an *isosceles triangle*.
6. A triangle with all three sides equal is called an *equilateral triangle*.
7. A triangle with one angle as 90^0 is called a *right triangle*.
8. Area of a triangle = (½) Any side × the altitude on that side,
   $= \sqrt{\{s(s-a)(s-b)(s-c)\}}$, $[s = (a + b + c)/2$, a, b, c being the sides],
   = (½) Product of any two sides × sin(included angle).
9. In a right triangle,
   i. the side opposite the right angle is called the hypotenuse,
   ii. the square of the hypotenuse is equal to the sum of the squares of the other two sides. [This is the famous Pythagorus Theorem.]
10. In a 30^0- 60^0- 90^0 right triangle, the sides are in the ratio 1 : √3 : 2.
11. In a 45^0- 45^0- 45^0 right triangle, the sides are in the ratio 1 : 1 : √2.
12. In an equilateral triangle with edge a,
    i. the altitude = $(\sqrt{3}/2)a$,
    ii. the area = $(\sqrt{3})a^2/4$,
    iii. in-radius = (½) Circum-radius,
    iv. area of the circum-circle = 4 × area of the in-circle.
13. In an isosceles triangle, the angles opposite the equal sides are also equal.

QUADRILATERALS

1. A quadrilateral is a
   - trapezium if just one pair of opposite sides is parallel,
   - parallelogram if both pairs of opposite sides are parallel or both pairs of opposite sides are equal or any one pair of opposite sides is both parallel and equal,
   - rectangle if all the vertical angles are right, the opposite sides are equal but the adjacent sides are unequal,
   - square if all the vertical angles are right and all the sides are equal,
   - rhombus if all the sides are equal,

- cyclic if it is inscribed in a circle, i.e. the vertices lie on the circumference of a circle.

2. In a parallelogram
   - The diagonals bisect each other.
   - The opposite angles are equal.
3. In a rectangle
   - The diagonals bisect each other.
   - The diagonals are equal.
4. In a square
   - The diagonals bisect each other at right angles.
   - The diagonals are equal.
5. In a rhombus
   - The diagonals bisect each other at right angles.
   - $4a^2 = d1^2 + d2^2$ where a = edge and $d1$ and $d2$ are diagonals.
6. In a cyclic quadrilateral, the opposite angles are supplementary.

POLYGONS

1. An n-sided figure is called a *polygon*.
2. Sum of all interior angles of a n-sided polygon = $(n-2) \times 180^0$.
3. Sum of all exterior angles of any polygon = 360^0
4. A polygon is *regular* if all its sides are equal and all its interior angles are equal.
5. Polygon nomenclature

No of Sides	5	6	7	8	9	10
Name of Polygon	Pentagon	Hexagon	Heptagon	Octagon	Nonagon	Decagon

6. Each angle of a regular hexagon = 120^0
7. Each angle of a regular decagon = 144^0

CIRCLES

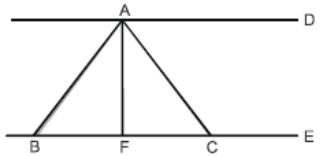
1. A circle is described as the path of a point which moves keeping a constant distance from a fixed reference point. The constant distance is called the radius and the fixed reference point is called the centre. Double the radius is called the diameter. Any straight line joining any two points on the circumference of the circle is called a chord and the part of the circumference cut off by the chord is called arc – the smaller one is called the minor arc and the larger one is known as major arc. A chord divides a circle into two parts called segments – the smaller one is called the minor segment and the larger one the major segment. Any straight line that cuts across a circle is called a secant and a straight line which touches a circle only at a single point is called a tangent.
2. The perpendicular from the centre to a chord bisects the chord and consequently, if l is the chord length, r the radius and d the distance of the centre from the chord, then $r^2 = (l/2)^2 + d^2$.
3. A chord subtends the same angle at every point on the same segment.
4. The angles subtended by a chord on any point on the major segment and on any point on the minor segment add to 180^0.
5. The angle subtended by a chord at any point on the circumference is half the angle subtended by the chord at the centre.
6. Diameter subtends 90^0 at every point on the circumference of the circle.
7. The angle between the tangent and the radius at the point of contact is 90^0.
8. From any point outside the circle, two tangents can be drawn and these two tangents are equal in length.
9. The part of the circle enclosed by any two radii and the intervening arc is called a *sector* of the circle. A sector is made up of a segment and a triangle.

EXERCISES

1) What is the complementary angle of half the supplementary angle of 60^0?

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

3) In the diagram given alongside, AD ∥ BE and ABC is isosceles with AB = AC. If AF is the altitude on BC and ∠DAC is 30^0., what is the measure of ∠BAF?



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

5) In a polygon one interior angle is 162^0. and each of the other interior angles is 142^0. How many sides does the polygon have?

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?

7) AB is a chord of a circle O and C is any point on the circumference of the circle. If ∠ACB = 60^0, what is the measure of ∠OAB?

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?

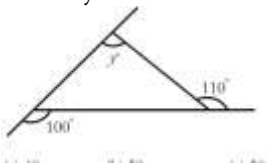
9) In a rhombus, the lengths of the diagonals are 40 metres and 30 metres respectively. Find its area and perimeter.

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

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?

12) In the figure given below, what is the value of y?



13) In a certain parallelogram the degree measure of one angle lower that of another angle by 60. What is the degree measure of the smaller angle?

14) In ΔABC, 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, ΔABC is

15) A circle has area which is 100 times the area of another circle. What is the ratio of their circumference?

16) If the height of a cone is increased by 21%, find the percentage decrease in its radius to make the volume constant.

17) Two chords of a circle when produced beyond the circle intersect at E. If ∠E = 30º and ∠A = 25º, Find ∠CBA.

CHAIN RULE

IMPORTANT FORMULAS

1. Direct Proportion:
   Two quantities are said to be directly proportional, if on the increase (or decrease) of the one, the other increases (or decreases) to the same extent.
   Eg. Cost is directly proportional to the number of articles.
   (More Articles, More Cost)
2. Indirect Proportion:
   Two quantities are said to be indirectly proportional, if on the increase of the one, the other decreases to the same extent and vice-versa.
   Eg. The time taken by a car is covering a certain distance is inversely proportional to the speed of the car. (More speed, Less is the time taken to cover a distance.)
   Note: In solving problems by chain rule, we compare every item with the term to be found out.

EXERCISES

1) A man completes 5/8 of a job in 10 days. At this rate, how many more days will it takes him to finish the job?

2) If a quarter kg of potato costs 60 paisa, how many paisas will 200 gm cost?

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?

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

5) If 7 spiders make 7 webs in 7 days, then 1 spider will make 1 web in how many days?

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

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?

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?

9) 36 men can complete a piece of work in 18 days. In how many days will 27 men complete the same work?

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?

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?

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?

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?

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:

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?

SIMPLIFICATION

IMPORTANT FORMULAS

1. 'BODMAS' Rule:
   This rule depicts the correct sequence in which the operations are to be executed, so as

to find out the value of given expression.

Here B - Bracket,

O - of,

D - Division,

M - Multiplication,

A - Addition and

S - Subtraction

Thus, in simplifying an expression, first of all the brackets must be removed, strictly in the order (), {} and ||.

After removing the brackets, we must use the following operations strictly in the order: (i) of (ii) Division (iii) Multiplication (iv) Addition (v) Subtraction.

2. Modulus of a Real Number:

Modulus of a real number a is defined as

$$|a| = \begin{cases} a, \text{ if } a > 0 \\ -a, \text{ if } a < 0 \end{cases}$$

Thus, $|5| = 5$ and $|-5| = -(-5) = 5$.

3. Virnaculum (or Bar):

When an expression contains Virnaculum, before applying the 'BODMAS' rule, we simplify the expression under the Virnaculum.

EXERCISES

1) A sum of Rs. 1360 has been divided among A, B and C such that A gets 2/3 of what B gets and B gets 1/4 of what C gets. B's share is

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 ?

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

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

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 ?

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 ?

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 ?

8) 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 ?

9) 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

10) $\dfrac{(469 + 174)^2 - (469 - 174)^2}{(469 \times 174)} = ?$

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?

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:

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:

14) 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?

15) If $a - b = 3$ and $a^2 + b^2 = 29$, find the value of ab

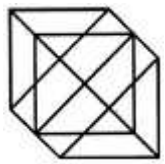
REASONING APTITUDE

ANALYTICAL REASONING

EXERCISES

Find the number of triangles in the given figure

1)



2)

3)

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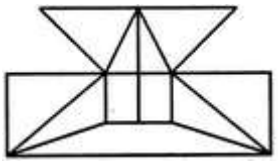

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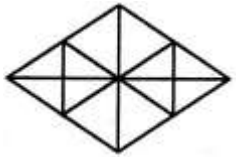

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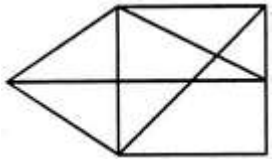
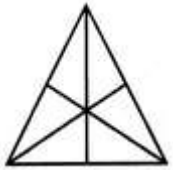
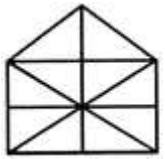


8)



9)

10)



11)

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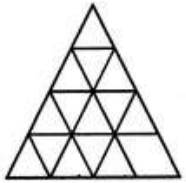

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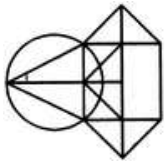

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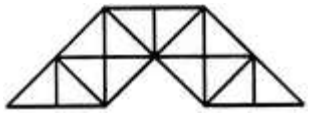

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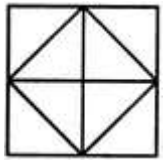

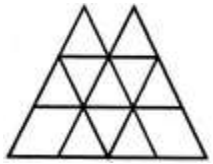

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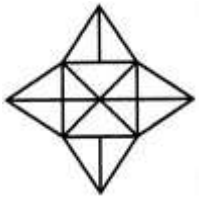

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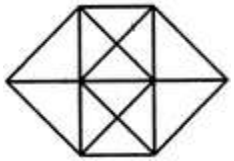

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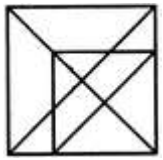
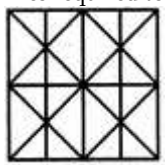
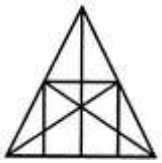


24) Find the minimum number of straight lines required to make the given figure



25) What is the number of straight lines and the number of triangles in the given 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?
A. 64 B. 32 C. 24 D. 16

LOGICAL PROBLEMS

I. Each problem consists of three statements. Based on the first two statements, the third statement may be true, false, or uncertain.

EXERCISES

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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.

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. II and III only
D. None of the statements is a known fact.

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.

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. II and III only
D. None of the statements is a known fact.

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. II and III only
D. None of the statements is a known fact.

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. II only C. II and III only
D. None of the statements is a known fact.

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.

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.

Fact 1: All hats have brims.
Fact 2: There are black hats and blue hats.
Fact 3: Baseball caps are hats.
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.

III. 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

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

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

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

5) Danielle has been visiting friends in Ridgewood 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

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

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

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

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

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

LOGICAL GAMES

EXERCISES

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

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

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.

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 CEO ?
A. Alice B. Bert C. Cheryl D. David E. Enid

2) What color is the vice president's car?
A. green B. yellow C. blue D. purple E. red

3) Who is the secretary?
A. Enid B. David C. Cheryl D. Bert E. Alice

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) How much rain did Mile City get?
A. 12 inches B. 27 inches C. 32 inches
D. 44 inches E. 65 inches

2) Which city is in the desert ?
A. Last Stand B. Mile City C. New Town
D. Olliopolis E. Polberg

3) Where is Olliopolis located?
A. the mountains B. the coast
C. in a valley
D. the desert E. the forest

4) Which city got the most rain?
A.Last Stand B.Mile City C.New Town
D.Olliopolis E.Polberg

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 day does Uma do her task?
A. Monday B. Tuesday C. Wednesday
D. Thursday E. Friday

2) What task does Vernon do?
A. vacuuming B. dusting C. mopping
D. sweeping E. laundry

3) What day is the vacuuming done?
A. Friday B. Monday C. Tuesday
D. Wednesday E. Thursday

4) When does Sally do the dusting?
A. Friday B. Monday C. Tuesday
D. Wednesday E. Thursday

5) What task does Terry do on Wednesday?
A. vacuuming B.dusting C.mopping D.sweeping E.laundry

LOGICAL DEDUCTION

EXERCISES

In each question below are given two statements followed by two conclusions numbered I and II. You have to take the given two statements to be true even if they seem to be at variance from commonly known facts. Read the conclusion and then decide which of the given conclusions logically follows from the two given statements, disregarding commonly known facts.

Statements: All bags are cakes. All lamps are cakes.
Conclusions:
Some lamps are bags.
No lamp is bag.

Statements: Some kings are queens. All queens are beautiful.
Conclusions:
All kings are beautiful.
All queens are kings.

Statements: All roads are waters. Some waters are boats.
Conclusions:
Some boats are roads.
All waters are boats.

Statements: All mangoes are golden in color. No golden-colored things are cheap.
Conclusions:
All mangoes are cheap.
Golden-colored mangoes are not cheap.

Statements: Some doctors are fools. Some fools are rich.
Conclusions:
Some doctors are rich
Some rich are doctors

Statements: No bat is ball. No ball is wicket.
Conclusions:
No bat is wicket.
All wickets are bats.

Statements: All flowers are trees. No fruit is tree.
Conclusions:
No fruit is flower.
Some trees are flowers.

Statements: Every minister is a student. Every student is inexperienced.
Conclusions:
Every minister is inexperienced.
Some inexperienced are students.

Statements: All fish are tortoise. No tortoise is a crocodile.
Conclusions:
No crocodile is a fish.
No fish is a crocodile.

Statements: No gentleman is poor. All gentlemen are rich.
Conclusions:
No poor man is rich.
No rich man is poor.

Statements: All fishes are grey in color. Some fishes are heavy.
Conclusions:
All heavy fishes are grey in color.
All light fishes are not grey in color.

Statements: All film stars are playback singers. All film directors are film stars.
Conclusions:
All film directors are playback singers.
Some film stars are film directors.

Statements: Some dreams are nights. Some nights are days.
Conclusions:
All days are either nights or dreams.
Some days are nights.

Statements: Some adults are boys. Some boys are old.
Conclusions:
Some adults are not old.
Some boys are not old.

Statements: All roads are poles. No pole is a house.
Conclusions:
Some roads are houses.
Some houses are poles.

Statements: Some dedicated souls are angels. All social workers are angels.
Conclusions: Some dedicated souls are social workers. Some social workers are dedicated souls.
Statements: Some swords are sharp. All swords are rusty
Conclusions:
Some rusty things are sharp.
Some rusty things are not sharp.

Statements: All good athletes win. All good athletes eat well.
Conclusions:
All those who eat well are good athletes.
All those who win eat well.

Statements: All hill stations have a sun-set point. X is a hill station.
Conclusions:
X has a sun-set point.
Places other than hill stations do not have sun-set points.

Statements: All jungles are tigers. Some tigers are horses.
Conclusions:
Some horses are jungles.
No horse is jungle.

DATA SUFFICIENCY

In each of the questions below consists of a question and two statements numbered I and II given below it. You have to decide whether the data provided in the statements are sufficient to answer the question. Read both the statements and Give answer

1) **(A) If the data in statement I alone are sufficient to answer the question, while the data in statement II alone are not sufficient to answer the question**
2) **(B) If the data in statement II alone are sufficient to answer the question, while the data in statement I alone are not sufficient to answer the question**
3) **(C) If the data either in statement I alone or in statement II alone are sufficient to answer the question**
4) **(D) If the data given in both statements I and II together are not sufficient to answer the question and**
5) **(E) If the data in both statements I and II together are necessary to answer the question.**

EXERCISES

1) What is the code for 'sky' in the code language?
Statements:
In the code language, 'sky is clear' is written as 'de ra fa'.
In the same code language, 'make it clear' is written as 'de ga jo'

2) How many children are there between P and Q in a row of children?
Statements:
P is fifteenth from the left in the row.
Q is exactly in the middle and there are ten children towards his right.

3) How is T related to K?
Statements:
R's sister J has married Ts brother L, who is the only son of his parents.
K is the only daughter of L and J.

4) How is J related to P?
Statements:
M is brother of P and T is sister of P.
P's mother is married to J's husband who has one son and two daughters.

5) How is X related to Y?
Statements:
Y and Z are children of D who is wife of X.
R's sister X is married to Ys father.

6) Who is to the immediate right of P among five persons P, Q, R, S and T facing North?
Statements:
R is third to the left of Q and P is second to the right of R.
Q is to the immediate left of T who is second to the right of P.

7) Who is to the immediate right of P among five persons P, Q, R, S and T facing North?
Statements:
R is third to the left of Q and P is second to the right of R.
Q is to the immediate left of T who is second to the right of P.

8) On which date of the month was Anjali born in February 2004?
Statements:
Anjali was born on an even date of the month.
Anjali's birth date was a prime number.

9) How is X related to Y?
Statements:
Y says, "I have only one brother".
X says, "I have only one sister".

10) How is F related to P?
Statements:
P has two sisters M and N.
F's mother is sister of M's father.

11) When is Manohar's birthday this year ?
Statements:
It is between January 13 and 15, January 13 being Wednesday.
It is not on Friday.

12) How is 'No' coded in the code language ?
Statements:
'Ne Pa Sic Lo' means 'But No None And' and 'Pa Lo Le Ne' means 'If None And But'.
'Le Se Ne Sic' means 'If No None Will' and 'Le Pi Se Be' means 'Not None If All'.

13) Who among P, Q, T, V and M is exactly in the middle when they are arranged in ascending order of their heights?
Statements:
V is taller than Q but shorter than M.
T is taller than Q and M but shorter than P.

14) Which code word stands for 'good' in the coded sentence 'sin co bye' which means 'He is good'?
Statements:
In the same code language, 'co mot det' means 'They are good'.
In the same code language, 'sin mic bye' means 'He is honest'.

15) What is the numerical code for 'water' in a certain code?
Statements:
The code for 'give me water' is '719'. The code for 'you can bring water for me' is written as '574186'.

16) A is D's brother. F is mother of D. How is D related to A?
Statements:
F has only one son and one daughter.
A is the only son of P who has two children.

17) How many visitors saw the exhibition yesterday?
Statements:
Each entry pass holder can take up to three persons with him/her.
In all, 243 passes were sold yesterday.

18) Gaurav ranks eighteenth from the top in a class. What is his rank from the last?
Statements:
There are 47 students in the class.
Jatin who ranks 10th in the same class, ranks 38th from the last.

19) What is the rank of P from the bottom in a class of 30 students?
Statements:
M is third from the top and there are five students between M and P.
The rank of K is fourth from the bottom and there are 17 students between K and P.

20) In a row of five buildings - P, Q, R, S and T, which building is in the middle?
Statements:
Buildings S and Q are at the two extreme ends of the row.
Building ,T is to the right of building R.

ARITHMETIC REASONING

EXERCISES

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

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

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

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

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

6) A is 3 years older to B and 3 years younger to C, while B and D are twins. How many years older is C to D?
A. 2 B. 3 C. 6 D. 12

7) The 30 members of a club decided to play a badminton singles tournament. Every time a member loses a game he is out of the tournament. There are no ties. What is the minimum number of matches that must be played to determine the winner ?
A. 15 B. 29 C. 61 D. None of these

8) In a garden, there are 10 rows and 12 columns of mango trees. The distance between the two trees is 2 metres and a distance of one metre is left from all sides of the boundary of the garden. The length of the garden is
A. 20 m B. 22 m C. 24 m D. 26 m

9) 12 year old Manick is three times as old as his brother Rahul. How old will Manick be when he is twice as old as Rahul ?
A. 14 years B. 16 years
C. 18 years D. 20 years

10) A tailor had a number of shirt pieces to cut from a roll of fabric. He cut each roll of equal length into 10 pieces. He cut at the rate of 45 cuts a minute. How many rolls would be cut in 24 minutes?
A. 32 rolls B. 54 rolls C. 108 rolls D. 120 rolls

11) A student got twice as many sums wrong as he got right. If he attempted 48 sums in all, how many did he solve correctly ?
A. 12 B. 16 C. 18 D. 24

12) 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?
A. 19 B. 28 C. 30 D. 37

13) I have a few sweets to be distributed. If I keep 2, 3 or 4 in a pack, I am left with one sweet. If I keep 5 in a pack, I am left with none. What is the minimum number of sweets I have to pack and distribute?
A. 25 B. 37 C. 54 D. 65

14) If a clock takes seven seconds to strike seven, how long will it take to strike ten?
A. 7 seconds B. 9 seconds
C. 10 seconds D. None of these

15) In a group of cows and hens, the number of legs is 14 more than twice the number of heads. The number of cows is
A. 5 B. 7 C. 10 D. 12

16) A father tells his son, "I was of your present age when you were born". If the father is 36 now, how old was the boy five years back?
A. 13 B. 15 C. 17 D. 20

17) 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
A. 30 birds B. 60 birds
C. 72 birds D. 90 birds

18) In a class, 3/5 of the students are girls and rest is boys. If 2/9 of the girls and 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

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

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

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

C. 1 million km D. 1 billion km

DATA INTERPRETATION TABLE CHARTS

I. Study the following table and answer the questions.

Number of Candidates Appeared and Qualified in a Competitive Examination from Different States over the Years.

State	Year									
	1997		1998		1999		2000		2001	
	App.	Qual.	App.	Qual.	App.	Qual.	App.	Qual.	App.	Qual.
M	5200	720	8500	980	7400	850	6800	775	9500	1125
N	7500	840	9200	1050	8450	920	9200	980	8800	1020
P	6400	780	8800	1020	7800	890	8750	1010	9750	1250
Q	8100	950	9500	1240	8700	980	9700	1200	8950	995
R	7800	870	7600	940	9800	1350	7600	945	7990	885

1) Total number of candidates qualified from all the states together in 1997 is approximately what percentage of the total number of candidates qualified from all the states together in 1998?
A. 72% B. 77% C. 80% D. 83%

2) What are the average candidates who appeared from State Q during the given years?
A. 8700 B. 8760 C. 8990 D. 8920

3) In which of the given years the number of candidates appeared from State P has maximum percentage of qualified candidates?
A. 1997 B. 1998 C. 1999 D. 2001

4) What is the percentage of candidates qualified from State N for all the years together, over the candidates appeared from State N during all the years together?
A. 12.36% B. 12.16% C. 11.47% D. 11.15%

5) The percentage of total number of qualified candidates to the total number of appeared candidates among all the five states in 1999 is?
A. 11.49% B. 11.84% C. 12.21% D. 12.57%

6) Combining the states P and Q together in 1998, what is the percentage of the candidates qualified to that of the candidate appeared?
A.10.87% B.11.49% C.12.35% D.12.54%

II. The following table gives the percentage of marks obtained by seven students in six different subjects in an examination.

The Numbers in the Brackets give the Maximum Marks in Each Subject.

Student	Subject (Max. Marks)					
	Maths	Chemistry	Physics	Geography	History	Computer Science
	(150)	(130)	(120)	(100)	(60)	(40)
Ayush	90	50	90	60	70	80
Aman	100	80	80	40	80	70
Sajal	90	60	70	70	90	70
Rohit	80	65	80	80	60	60
Muskan	80	65	85	95	50	90
Tanvi	70	75	65	85	40	60
Tarun	65	35	50	77	80	80

1. What are the average marks obtained by all the seven students in Physics? (rounded off to two digit after decimal)
A. 77.26 B. 89.14 C. 91.37 D. 96.11

2) The number of students who obtained 60% and above marks in all subjects is?
A. 1 B. 2 C. 3 D. None

3) What was the aggregate of marks obtained by Sajal in all the six subjects?
A. 409 B. 419 C. 429 D. 449

4) In which subject is the overall percentage the best?
A. Maths B. Chemistry C. Physics D. History

5) What is the overall percentage of Tarum?
A. 52.5% B. 55% C. 60% D. 63%

III. Study the following table and answer the questions.

Classification of 100 Students Based on the Marks Obtained by them in Physics and Chemistry in an Examination.

Subject	Marks out of 50				
	40 and above	30 and above	20 and above	10 and above	0 and above

Physics	9	32	80	92	100
Chemistry	4	21	66	81	100
Average (Aggregate)	7	27	73	87	100

1) What is the different between the number of students passed with 30 as cut-off marks in Chemistry and those passed with 30 as cut-off marks in aggregate?
A.3 B. 4 C. 5 D. 6

2) If at least 60% marks in Physics are required for pursuing higher studies in Physics, how many students will be eligible to pursue higher studies in Physics?
A.27 B. 32 C. 34 D. 41

3) The percentage of number of students getting at least 60% marks in Chemistry over those getting at least 40% marks in aggregate, is approximately?
A.21% B. 27% C. 29% D. 31%

4) The number of students scoring less than 40% marks in aggregate is?
A. 13 B. 19 C. 20 D. 27

5) If it is known that at least 23 students were eligible for a Symposium on Chemistry, then the minimum qualifying marks in Chemistry for eligibility to Symposium would lie in the range?
A. 40-45 B. 30-40 C. 20-30 D. Below 20

IV. Study the following table and answer the questions based on it.
Number of Candidates Appeared, Qualified and Scheduled in a Competitive Examination from 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

2) The percentage of candidates qualified from Punjab over those appeared from Punjab is highest in the year?
A. 1997 B. 1998 C. 1999 D. 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

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% D. 88.5%

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

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%

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					
	4AH	7AH	32AH	35AH	55AH	Total
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%

2) The total sales of all the seven years are the maximum for which battery?
A. 4AH B. 7AH C. 32AH D. 35AH

3) What is the difference in the number of 35AH batteries sold in 1993 and 1997?
A. 24000 B. 28000 C. 35000 D. 39000

4) The percentage of 4AH batteries sold to the total number of batteries sold was maximum in the year?
A. 1994 B. 1995 C. 1996 D. 1997

5) In case of which battery there was a continuous decrease in sales from 1992 to 1997?
A. 4AH B. 7AH C. 32AH D. 35AH

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 comparison 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.
D. The two examinations cannot be compared for difficulty level.

2) How many students are there in Class IX in the school?
A. 336 B. 189 C. 335 D. 430

4) Which section has the maximum pass percentage in at least one of the two examinations?
A. A Section B. B Section C. C Section D. D Section

5) Which section has the maximum success rate in annual examination?
A. A Section B. B Section C. C Section D. D Section

5) Which section has the minimum failure rate in half yearly examination?
A. A Section B. B Section C. C Section D. D Section

VII. The following table shows the number of new employees added to different categories of employees in a company and also the number of employees from these categories who left the company every year since the foundation of the Company in 1995.

Year	Managers		Technicians		Operators		Accountants		Peons	
	New	Left	New	Left	New	Left	New	Left	New	Left
1995	760	-	1200	-	880	-	1160	-	820	-
1996	280	120	272	120	256	104	200	100	184	96
1997	179	92	240	128	240	120	224	104	152	88
1998	148	88	236	96	208	100	248	96	196	80
1999	160	72	256	100	192	112	272	88	224	120
2000	193	96	288	112	248	144	260	92	200	104

1) What is the difference between the total number of Technicians added to the Company and the total number of Accountants added to the Company during the years 1996 to 2000?
A. 128 B. 112 C. 96 D. 88

2) What was the total number of Peons working in the Company in the year 1999?
A. 1312 B. 1192 C. 1088 D. 968

3) For which of the following categories the percentage increase in the number of employees working in the Company from 1995 to 2000 was the maximum?
A. Managers B. Technicians
C. Operators D. Accountants

4) What is the pooled average of the total number of employees of all categories in the year 1997?
A. 1325 B. 1195 C. 1265 D. 1235

5) What is the pooled average of the total number of employees of all categories in the year 1997?
A. 1325 B. 1195 C. 1265 D. 1235

6) During the period between 1995 and 2000, the total number of Operators who left the Company is what percent of total number of Operators who joined the Company?
A. 19% B. 21% C. 27% D. 29%

VIII. The following table gives the percentage distribution of population of five states, P, Q, R, S and T on the basis of poverty line and also on the basis of sex.

State	Percentage of Population below the Poverty Line	Proportion of Males and Females	
		Below Poverty Line	Above Poverty Line
		M : F	M : F
P	35	5 : 6	6 : 7
Q	25	3 : 5	4 : 5

R	24	1 : 2	2 : 3
S	19	3 : 2	4 : 3
T	15	5 : 3	3 : 2

1) If the male population above poverty line for State R is 1.9 million, then the total population of State R is?
A. 4.5 million B. 4.85 million
C. 5.35 million D. 6.25 million

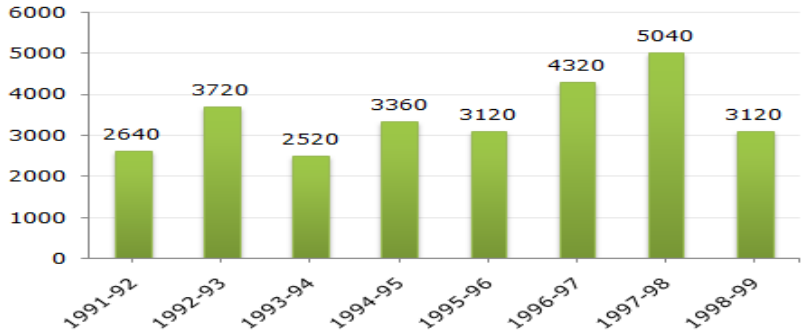
2) What will be the number of females above the poverty line in the State S if it is known that the population of State S is 7 million?
A. 3 million B. 2.43 million
C. 1.33 million D. 5.7 million

3) What will be the male population above poverty line for State P if the female population below poverty line for State P is 2.1 million?
A. 2.1 million B. 2.3 million
C. 2.7 million D. 3.3 million

4) If the population of males below poverty line for State Q is 2.4 million and that for State T is 6 million, then the total populations of States Q and T are in the ratio?
A. 1:3 B. 2:5 C. 3:7 D. 4:9

DATA INTERPRETATION
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. Foreign Exchange Reserves Of a Country. (in million US $)



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

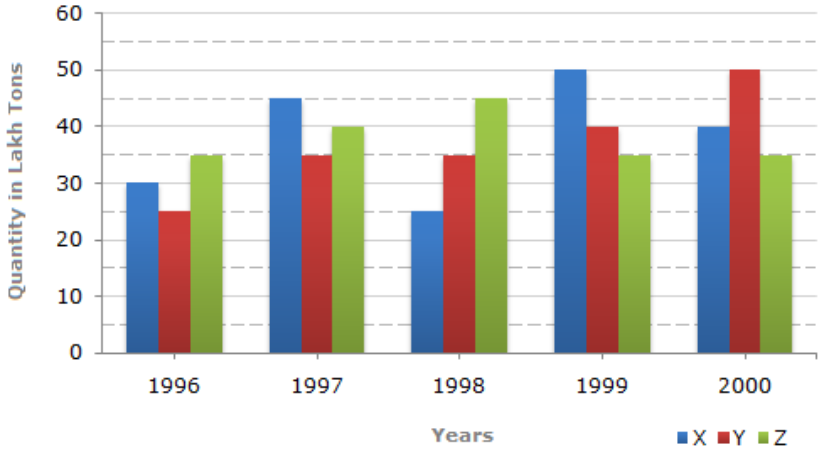
2) The foreign exchange reserves in 1997-98 were how many times that in 1994-95?
A. 0.7 B. 1.2 C. 1.4 D. 1.5

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

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%

5) What was the percentage increase in the foreign exchange reserves in 1997-98 over 1993-94?
A.100 B.150 C.200 D.620

II. The bar graph given below shows the data of the production of paper (in lakh tonnes) by three different companies X, Y and Z over the years. Production of Paper (in lakh tonnes) by Three Companies X, Y and Z over the Years.



EXERCISES

1) For which of the following years, the percentage rise/fall in production from the previous year is the maximum for Company Y?
A. 1997 B. 1998 C. 1999 D. 2000

2) What is the ratio of the average production of Company X in the period 1998-2000 to the average production of Company Y in the same period?
A. 1:1 B. 15:17 C. 23:25 D. 27:29

3) The average production for five years was maximum for which company?
A. X B. Y C. Z D. X and Z both

4) In which year was the percentage of production of Company Z to the production of Company Y the maximum?
A. 1996 B. 1997 C. 1998 D. 1999

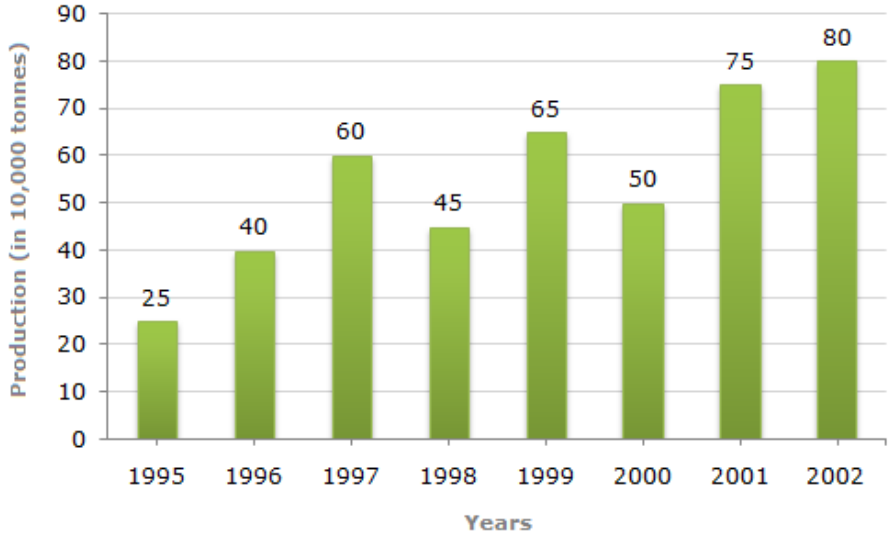
5) What is the percentage increase in the production of Company Y from 1996 to 1999?

6) What is the difference between the production of Company Z in 1998 and Company Y in 1996?

A. 30% B. 45% C. 50% D. 60%

A. 2,00,000 tons B. 20,00,000 tons
C. 20,000 tons D. 2,00,00,000 tons

III. Study the bar chart and answer the question based on it. Production of Fertilizers by a Company (in 1000 tonnes) Over the Years



EXERCISES

1) What was the percentage decline in the production of fertilizers from 1997 to 1998?
A. 33(1/3)% B. 20% C. 25% D. 21%

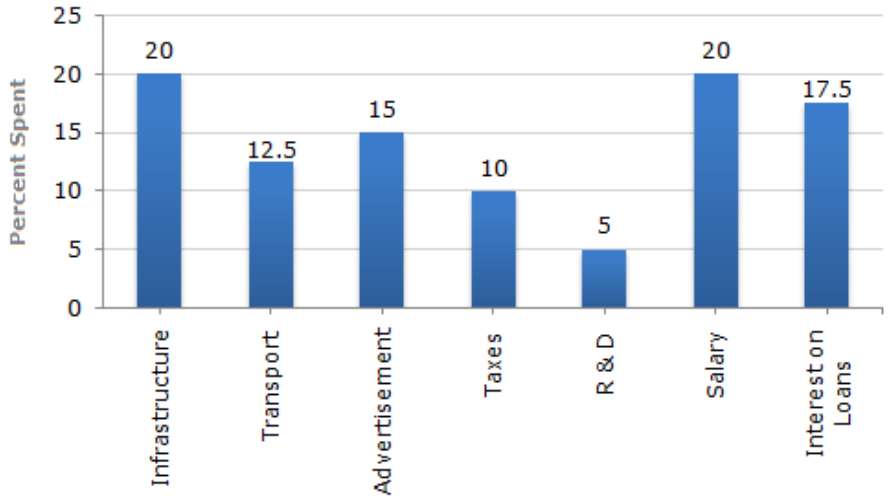
2) The average production of 1996 and 1997 was exactly equal to the average production of which of the following pairs of years?
A. 2000 and 2001 B. 1999 and 2000
C. 1998 and 2000 D. 1995 and 2001

3) What was the percentage increase in production of fertilizers in 2002 compared to that in 1995?
A. 320% B. 300% C. 220% D. 200%

4) In which year was the percentage increase in production as compared to the precious year the maximum?
A. 2002 B. 2001 C. 1997 D. 1996

5) In how many of the given years was the production of fertilizers more than the average production of the given years?
A. 1 B. 2 C. 3 D. 4

IV. The bar graph given below shows the percentage distribution of the total expenditures of a company under various expense heads during 2003. Percentage Distribution of Total Expenditure of a Company



1) The total amount of expenditures of the company is how many times of expenditure on research and development?
A. 27 B. 20 C. 18 D. 8

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

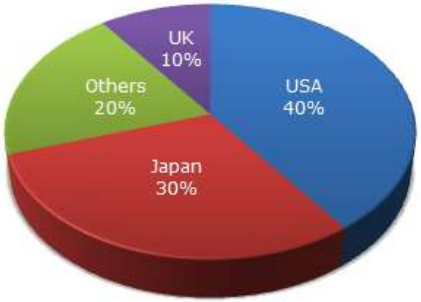
3) What is the ratio of the total expenditure on infrastructure and transport to the total expenditure on taxes and interest on loans?
A. 5:4 B. 8:7 C. 9:7 D. 13:11

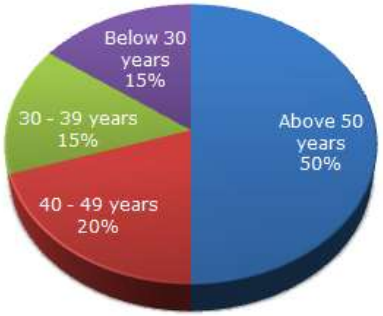
4) If the interest on loans amounted to Rs. 2.45 crores then the total amount of expenditure on advertisement, taxes and research and development is?
A. Rs. 7 crores B. Rs. 5.4 crores
C. Rs. 4.2 crores D. Rs. 3 crores

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%

DATA INTERPRETATION
PIE CHARTS

I. The following pie charts exhibit the distribution of the overseas tourist traffic from India. The two charts show the tourist distribution by country and the age profiles of the tourists respectively. Distribution of Overseas Tourist Traffic from India.





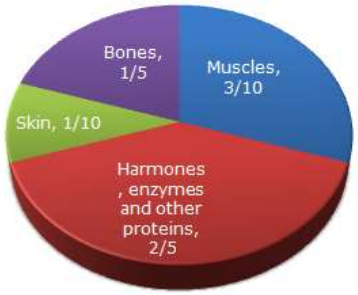
1) What percentage of Indian tourist went to either USA or UK?
A. 40 % B. 50 % C. 60 % D. 70 %

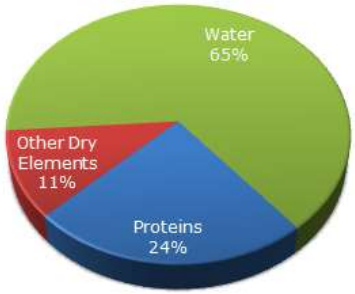
2) The ratio of the number of Indian tourists that went to USA to the number of Indian tourists who were below 30 years of age is?
A. 2:1 B. 8:3 C. 3:8 D. Cannot be determined

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

II. The following pie chart gives 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



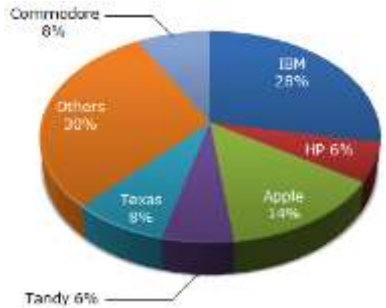


1) What percentage of proteins of the human body is equivalent to the weight of its skin?
A. 41.66 % B. 43.33 %
C. 44.44 % D. Cannot be determined

2) How much of the human body is neither made of bones or skin?
A. 40 % B. 50 % C. 60 % D. 70 %

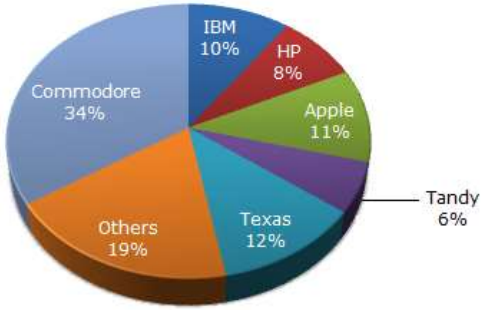
3) What is the ratio of the distribution of proteins in the muscles to that of the distribution of proteins in the bones?
A. 2:1 B. 2:3 C. 3:2 D. Cannot be determined

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 realized the lowest average unit sales price for a PC ?
A. Commodore B. IBM
C. Tandy D. Cannot be determined

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

3) In 2005, the average unit sale price of an IBM PC was approximately (in US$)
A. 3180 B. 2800 C. 393 D. 3080

IV. The following pie-chart shows the sources of funds to be collected by the National Highways Authority of India (NHAI) for its Phase II projects. Study the pie-chart and answers the question that follow. Sources of funds to be arranged by NHAI for Phase II projects (in crores Rs.)

1) Near about 20% of the funds are to be arranged through:
A. SPVS B. External Assistance
C. Annuity D. Market Borrowing

2) If NHAI could receive a total of Rs. 9695 crores as External Assistance, by what percent (approximately) should it increase the Market Borrowing to arrange for the shortage of funds?
A. 4.5% B. 7.5% C. 6% D. 8%

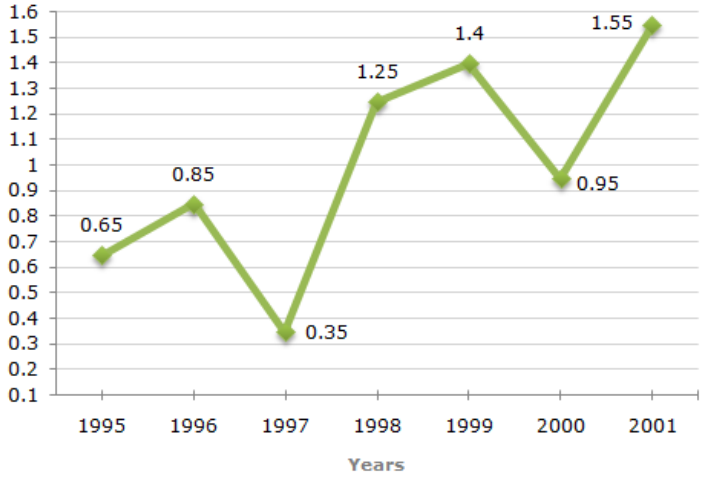
3) The approximate ratio of the funds to be arranged through Toll and that through Market Borrowing is
A. 2 : 9 B. 1 : 6 C. 3 : 11 D. 2 : 5

4) The central angle corresponding to Market Borrowing is
A. 52º B. 137.8º C. 187.2º D. 192.4º

5) If the toll is to be collected through an outsourced agency by allowing a maximum 10% commission, how much amount should be permitted to be collected by the outsourced agency, so that the project is supported with Rs. 4910 crores?
A. Rs. 6213 crores B. Rs. 5827 crores
C. Rs. 5401 crores D. Rs. 5316 crores

DATA INTERPRETATION
LINE CHARTS

I. The following line graph gives the ratio of the amounts of imports by a company to the amount of exports from that company over the period from 1995 to 2001.
Ratio of Value of Imports to Exports by a Company Over the Years.



EXERCISES

1) If the imports in 1998 were Rs. 250 crores and the total exports in the years 1998 and 1999 together was Rs. 500 crores, then the imports in 1999 was?
A. Rs. 250 crores B. Rs. 300 crores
C. Rs. 357 crores D. Rs. 420 crores

2) The imports were minimum proportionate to the exports of the company in the year?
A. 1995 B. 1996 C. 1997 D. 2000

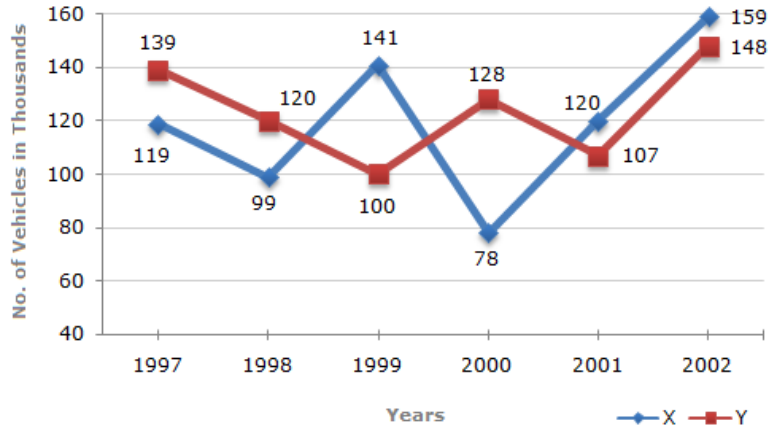
3) What was the percentage increase in imports from 1997 to 1998?
A. 72 B. 56 C. 28 D. Data inadequate

4) If the imports of the company in 1996 was Rs. 272 crores, the exports from the company in 1996 was?
A. Rs. 370 crores B. Rs. 320 crores
C. Rs. 280 crores D. Rs. 275 crores

5) In how many of the given years were the exports more than the imports?
A. 1 B. 2 C. 3 D. 4

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)



EXERCISES

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

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

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

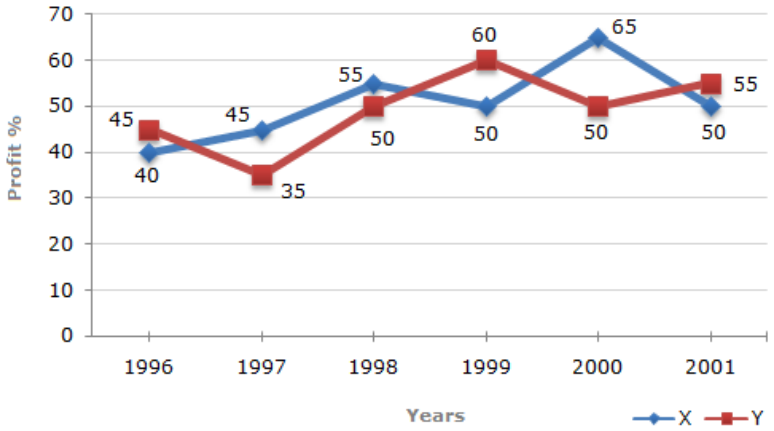
4) In which of the following years, the difference between the productions of Companies X and Y was the maximum among the given years?
A. 1997 B. 1998 C. 1999 D. 2000

5) The production of Company Y in 2000 was approximately what percent of the production of Company X in the same year
A. 173 B. 164 C. 132 D. 97

III. The following line graph gives the percent profit earned by two Companies X and Y during the period 1996 - 2001.

Percentage profit earned by Two Companies X and Y over the Given Years

$$\%\text{Profit} = \frac{\text{Income - Expenditure}}{\text{Expenditure}} \times 100$$



EXERCISES

1) The incomes of two Companies X and Y in 2000 were in the ratio of 3:4 respectively. What was the respective ratio of their expenditures in 2000?
A. 7:22 B. 14:19 C. 15:22 D. 27:35

2) If the expenditure of Company Y in 1997 was Rs. 220 crores, what was its income in 1997?
A. Rs. 312 crores B. Rs. 297 crores
C. Rs. 283 crores D. Rs. 275 crores

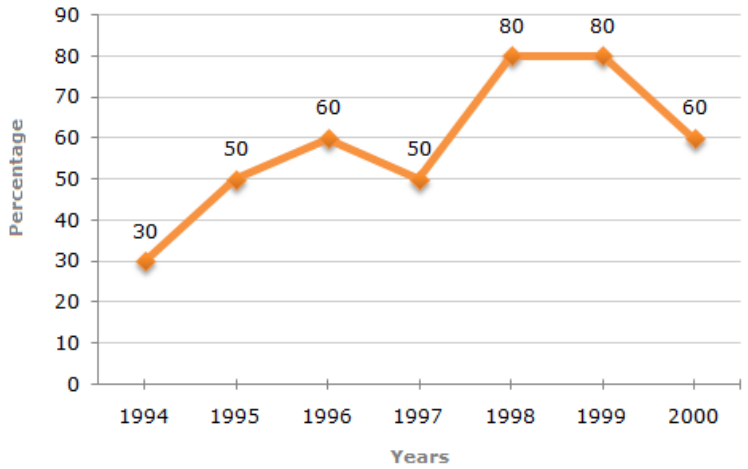
3) If the expenditures of Company X and Y in 1996 were equal and the total income of the two Companies in 1996 was Rs. 342 crores, what was the total profit of the two Companies together in 1996? (Profit = Income - Expenditure)
A. Rs. 240 crores B. Rs. 171 crores
C. Rs. 120 crores D. Rs. 102 crores

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

5) If the incomes of two Companies 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

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



EXERCISES

1) The difference between the percentages of candidates qualified to appear 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

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 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

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

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

DATA SUFFICIENCY (DS) PROBLEMS ON TRAINS

Each of the questions given below consists of a statement and / or a question and two statements given below it (in italicized). You have to decide whether the data provided in the statement(s) is / are sufficient to answer the given question. Read the both statements and

- Give answer (A) if the data in Statement I alone are sufficient to answer the question, while the data in Statement II alone are not sufficient to answer the question.
- Give answer (B) if the data in Statement II alone are sufficient to answer the question, while the data in Statement I alone are not sufficient to answer the question.
- Give answer (C) if the data either in Statement I or in Statement II alone are sufficient to answer the question.
- Give answer (D) if the data even in both Statements I and II together are not sufficient to answer the question.
- Give answer (E) if the data in both Statements I and II together are necessary to answer the question.

EXERCISES

1) What is the speed of the train whose length is 210 metres?
The train crosses another train (Howrah Express/12869) of 300 metres length running in opposite direction in 10 seconds.
The train crosses another train (Howrah Express/12869) running in the same direction at the speed of 60 km/hr in 30 seconds.

2) What is the length of a running train crossing another 180 metre long train running in the opposite direction?
The relative speed of the two trains was 150 kmph.
The trains took 9 seconds to cross each other.

3) What is the length of a running train?
The train crosses a man in 9 seconds.
The train crosses a 240 metre long platform in 24 seconds.

4) What is the speed of the train?
The train crosses a signal pole in 18 seconds.
The train crosses a platform of equal length in 36 seconds.
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

5) What is the speed of the train?
The train crosses a tree in 13 seconds.
The train crosses a platform of length 250 metres in 27 seconds.
The train crosses another train running in the same direction in 32 seconds.

6) At what time will the train reach city X from city Y?
The train crosses another train of equal length of 200 metres and running in opposite directions in 15 seconds.
The train leaves city Y and 7.15 a.m. for

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

city X situated at a distance of 558 km.
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.

7) What is the length of a running train P crossing another running train Q?
These two trains take 18 seconds to cross each other.
These trains are running in opposite directions.
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. Answer cannot be obtained.

DS - TIME AND DISTANCE

EXERCISES

1) Two towns are connected by railway. Can you find the distance between them?
The speed of the mail train is 12 km/hr more than that of an express train.
A mail train takes 40 minutes less than an express train to cover the distance.

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?
The distance from A to B is 25% more than the distance from C to B.
The distance from A to C is of the distance C to B.

3) Two cars pass each other in opposite direction. How long would they take to be 500 km apart?
The sum of their speeds is 135 km/hr.
The difference of their speed is 25 km/hr.

4) How much time did X take to reach the destination?
The ratio between the speed of X and Y is 3 : 4. Y takes 36 minutes to reach the same destination.

DS - TIME AND WORK

EXERCISES

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?
A completed the job alone after A and B worked together for 5 days.
Part of the work done by A could have been done by B and C together in 6 days.

2) How long will Machine Y, working alone, take to produce x candles?
Machine X produces x candles in 5 minutes.
Machine X and Machine Y working at the same time produce x candles in 2 minutes.

3) In how many days can 10 women finish a work?
10 men can complete the work in 6 days.
10 men and 10 women together can complete the work in 3 3/7 days.
If 10 men work for 3 days and thereafter 10 women replace them, the remaining work in 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

4) How many workers are required for completing the construction work in 10 days?
20% of the work can be completed by 8 workers in 8 days.
20 workers can complete the work in 16 days.
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

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?
19 men and 12 women together can complete the work in 18 days.
16 men can complete two-third of the work in 16 days.
In 1 day, the work done by three men in equal to the work done by four women.

DS - PIPES AND CISTERN

Each of the questions given below consists of a statement and / or a question and two statements numbered I and II given below it. You have to decide whether the data provided in the statement(s) is / are sufficient to answer the given question.

EXERCISES

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

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.

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 la 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

DS - SIMPLE INTEREST

EXERCISES

1) The simple interest on a sum of money is Rs. 50. What is the sum?
The interest rate is 10% p.a.
The sum earned simple interest in 10 years.

2) What is the sum which earned interest?
The total simple interest was Rs. 7000 after 7 years.
The total of sum and simple interest was double of the sum after 5 years.

3) What percentage of simple interest per annum *did Anand pay to Deepak?*
Anand borrowed Rs. 8000 from Deepak for four years.
Anand returned Rs. 8800 to Deepak at the end of two years and settled the loan.

4) What is the rate of simple interest?
The total interest earned was Rs. 4000.
The sum was invested for 4 years.

5) What is the principal sum?
The sum amounts to Rs. 690 in 3 years at S.I.
The sum amounts to Rs. 750 in 5 years at S.I.
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

DS - COMPOUND INTEREST

EXERCISES

1) What is the rate of compound interest?
The principal was invested for 4 years.
The earned interest was Rs. 1491.

2) What will be compounded amount?
Rs. 200 was borrowed for 192 months at 6% compounded annually.
Rs. 200 was borrowed for 16 years at 6%.

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?
The rate of interest was 8 p.c.p.a.
The total amount of simple interest was Rs. 1200.

4) What is the rate of interest p.c.p.a.?
An amount doubles itself in 5 years on simple interest.
Difference between the compound interest and the simple interest earned on a certain amount in 2 years is Rs. 400.
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
E. I only or II and III only

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 becomed 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

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

DS - PROFIT AND LOSS

EXERCISES

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.

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.

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?

Sale price of the article
Number of articles sold

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

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?

Number of toys sold.
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

5) By selling an article what is the profit percent gained?

5% discount is given on list price.
If discount is not given, 20% profit is gained.
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

6) What was the percentage of discount given?

23.5% profit was earned by selling an almirah for Rs. 12,350.
If there were no discount, the earned profit would have been 30%.
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
E. None of these

7) What is the percent profit earned by the shopkeeper on selling the articles in his shop?

Labeled price of the articles sold was 130% of the cost price.
Cost price of each article was Rs. 550.
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.

DS - PARTNERSHIP

EXERCISES

1) Ravi, Gagan and Nitin are running a business firm in partnership. What is Gagan's share in the profit earned by them?

Ravi, Gagan and Nitin invested the amounts in the ratio of 2 : 4 : 7.
Nitin's share in the profit is Rs. 8750.

2) Rahul, Anurag and Vivek started a business together. In what proportion would the annual profit be distributed among them?

Rahul got one-fourth of the profit.
Rahul and Vivek contributed 75% of the total investment.

3) What is R's share of profit in a joint venture?

Q started business investing Rs. 80,000.
R joined him after 3 months.
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

4) How much did Rohit get as profit at the year-end in the business done by Nitin, Rohit and Kunal?

Kunal invested Rs. 8000 for nine months, his profit was times that of Rohit's and his investment was four times that of Nitin.
Nitin and Rohit invested for one year in the proportion 1 : 2 respectively.
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

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?

Total amount invested in the business in Rs. 22,000.
Profit earned at the end of 3 years is of the total investment.
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

DS - PROBLEMS ON AGES

EXERCISES

1) What is Sonia's present age?

Sonia's present age is five times Deepak's present age.
Five years ago her age was twenty-five times Deepak's age at that time.

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?

Retirement age is 60 years.
There are 50 employees in the department.

3) Divya is twice as old as Shruti. What is the difference in their ages?

Five years hence, the ratio of their ages would be 9 : 5.
Ten years back, the ratio of their ages was 3 : 1.

4) What is Arun's present age?

Five years ago, Arun's age was double that of his son's age at that time.
Present ages of Arun and his son are in the ratio of 11 : 6 respectively.
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

5) What is Ravi's present age?
The present age of Ravi is half of that of his father.
After 5 years, the ratio of Ravi's age to that of his father's age will be 6 : 11.
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. Cannot be determined.

6) What is the present age of Tanya?
The ratio between the present ages of Tanya and her brother Rahul is 3 : 4 respectively. After 5 years the ratio between the ages of Tanya and Rahul will be 4 : 5.
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

7) What will be the ratio between ages of Sam and Albert after 5 years?
Sam's present age is more than Albert's present age by 4 years.
Albert's present age is 20 years.
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

8) What is the difference between the present ages of Ayush and Deepak?
The ratio between Ayush's present age and his age after 8 years 4 : 5.
The ratio between the present ages of Ayush and Deepak is 4 : 3.
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. The answer cannot be obtained.

DS - AVERAGE

EXERCISES

1) The average age of P, Q, R and S is 30 years. How old is R?
The sum of ages of P and R is 60 years.
S is 10 years younger than R.

2) What is the average age of children in the class?
The age of the teacher is as many years as the number of children.
Average age is increased by 1 year if the teacher's age is also included.

3) How many candidates were interviewed everyday by the panel A out of the three panels A, B and C?
The three panels on average interview 15 candidates every day.
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.

4) How many marks did Tarun secure in English? *The average mark obtained by Tarun in four subjects including English is 60.*
The total marks obtained by him in English and Mathematics together are 170.
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

5) In a cricket team, the average age of eleven players in 28 years. What is the age of the captain?
The captain is eleven years older than the youngest player.
The average age of 10 players, other than the captain is 27.3 years.
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

DS - AREA

EXERCISES

1) The area of playground is 1600 m2. What is the perimeter?
It is a perfect square playground.
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

2) The area of a rectangle is equal to the area of right-angles triangle. What is the length of the rectangle?
The base of the triangle is 40 cm.
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

3) What is the height of the triangle?
The area of the triangle is 20 times its base.
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

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?
Circumference of the floor is 44 feet.
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

5) What is the area of the hall?
Material cost of flooring per square metre is Rs. 2.50
Labour cost of flooring the hall is Rs. 3500
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

6) What is the area of a right-angled triangle?
The perimeter of the triangle is 30 cm.
The ratio between the base and the height of the triangle is 5 : 12.
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

7) What is the area of rectangular field?
The perimeter of the field is 110 metres.
The length is 5 metres more than the width.
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

8) What is the area of the given rectangle?
Perimeter of the rectangle is 60 cm.
Breadth of the rectangle is 12 cm.
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

9) What is the cost painting the two adjacent walls of a hall at Rs. 5 per m2 which has no windows or doors?
The area of the hall is 24 sq. m.
The breadth, length and height of the hall are in the ratio of 4 : 6 : 5 respectively.
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.

DS - VOLUME AND SURFACE AREA

EXERCISES

1) What is the volume of 32 metre high cylindrical tank?
The area of its base is 154 m2.
The diameter of the base is 14 m.

2) Is a given rectangular block, a cube?
At least 2 faces of the rectangular block are squares.
The volume of the block is 64.

3) What is the capacity of a cylindrical tank?
Radius of the base is half of its height which is 28 metres.
Area of the base is 616 sq. metres and its height is 28 metres.

4) What is the height of a circular cone?
The area of that cone is equal to the area of a rectangle whose length is 33 cm.
The area of the base of that cone is 154 sq. cm.

5) What is the volume of a cube?
The area of each face of the cube is 64 square metres.
The length of one side of the cube is 8 metres.

6) What is the capacity of the cylindrical tank?
The area of the base is 61,600 sq. cm.
The height of the tank is 1.5 times the radius.
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

DS - PROBLEMS ON NUMBERS

EXERCISES

1) What is the number?
The sum of the two digits is 8. The ratio of the two digits is 1 : 3.
The product of the two digit of a number is 12. The quotient of two digits is 3.

2) What is the two-digit number?
The difference between the two digits is 9.
The sum of the digits is equal to the difference between the two digits.

3) What is the two-digit number whose first digit is a and the second digit is b?.
The number is greater than 9.
The number is multiple of 51.
The sum of the digits a and b is 6.

4) What is the two-digit number?
The difference between the tow-digit number and the number formed by interchanging the digits is 27.
The difference between the two digits is 3.
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. Answer cannot be given.

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:
There are enough schools in the state to accommodate four thousand additional primary school teachers.
The eligible candidates may not be interested to apply as the government may not finally appoint such a large number of primary school teachers.

2) **Statement:** A warning in a train compartment - "To stop train, pull chain. Penalty for improper use Rs. 500."
Assumptions:
Some people misuse the alarm chain.
On certain occasions, people may want to stop a running train.

3) **Statement:** If it is easy to become an engineer, I don't want to be an engineer.
Assumptions:
An individual aspires to be professional.
One desires to achieve a thing which is hard earned.

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:
Railways should give concession only to needy persons.
Railways should not encourage people to spend their holidays at hill stations.

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:
The building of such bridges does not serve any public objective.
There has to be some accountability and utility of money spent on public projects.

6) **Statement:** The Government has decided to levy 2 percent on the tax amount payable for funding drought relief programmes.
Assumptions:
The Government does not have sufficient money to fund drought relief programmes. The amount collected by way of surcharge may be adequate to fund these drought relief programmes.

7) **Statement:** Try to steal this camera from our store - a display on a departmental store.
Assumptions:
People want to own a camera.
The store has a video monitoring system to detect stealing.

8) **Statement:** Detergents should be used to clean clothes.
Assumptions:
Detergents form more lather.
Detergents help to dislodge grease and dirt.

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:
Children in villages do not attend school regularly.
Providing school to every village is desirable.

10) **Statement:** The government has decided to disinvest large chunk of its equity in select public sector undertakings for a better fiscal management.
Assumptions:
The amount generated out of the disinvestment process may reduce substantially the mounting fiscal deficits.
There will be enough demand in the market for the shares of these undertakings.

11) **Statement:** Never before such a lucid book was available on the topic.
Assumptions:
Some other books were available on this topic.
You can write lucid books on very few topics.

12) **Statement:** Please do not use lift while going down - an instruction on the top floor of a five-storey building.
Assumptions:
While going down, the lift is unable to carry any load.
Provision of lift is a matter of facility and not of right.

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:
Every customer has a right to get bills regularly from the telephone company.
The customer's complaints point to defect in the services which are expected to be corrected.

14) **Statement:** "This drink can be had either as it is, or after adding ice to it." - An advertisement.
Assumptions:
People differ in their preferences.
Some people will get attracted to the drink as it can be had as it is.

15) **Statement:** Government has permitted unaided colleges to increase their fees.
Assumptions:
Unaided colleges are in financial difficulties. Aided colleges do not need to increase fees.

16) **Statement:** Be humble even after being victorious.
Assumptions:
Many people are humble after being victorious.
Generally people are not humble

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:
The government has enough funds to meet the expenses due to compensation.
There may be reduction in incidents of railway accidents in near future.

18) **Statement:** Films have become indispensable for the entertainment of people.
Assumptions:
Films are the only media of entertainment.
People enjoy films.

19) **Statement:** Of all the newspapers published in Mumbai, readership of the "Times" is the largest in the Metropolis.
Assumptions:
'Times' is not popular in Mumbai areas.
'Times' has the popular feature of cartoons on burning social and political issues.

20) **Statement:** Apart from the entertainment value of television, its educational value cannot be ignored.
Assumptions:
People take television to be a means of entertainment only.
The educational value of television is not realized properly.

MAKING ASSUMPTIONS

Each question presents a situation and asks you to make a judgment regarding that particular circumstance. Choose an answer based on given information.

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. 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

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 meet- ing, a resident noticed a man knocking on doors in the neighborhood and phoned the police to report the illegal activity. This solic- itor 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

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

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?
A. Marilyn has been a hygienist for fifteen years, and her current employer, who is about to 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.
B. Lindy recently graduated at the top of her class from one of the best dental hygiene programs in the state. Prior to becoming a dental hygienist, Lindy spent two years working

in a day care center.
C. James has worked as a dental hygienist for three years in a public health clinic. He is very interested in securing a position in a private dental office.
D. Kathy is an experienced and highly recommended dental hygienist who is also finishing up a 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.

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.

COURSE OF ACTION

In each question below are 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:
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.
All those students who desire to settle in the developed nations should be asked to pay entire cost of their education which the government subsidizes.

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
The villagers should be provided with alternate source of income in their villages which will make them stay put.
The migrated villagers should be provided with jobs in the urban areas to help them survive.

3) **Statement:** As stated in the recent census report the female to male ratio is alarmingly low.
Courses of Action:
The government should conduct another census to verify the results.
The government should immediately issue orders to all the departments to encourage people to improve the ratio.

4) **Statement:** There has been an unprecedented increase in the number of successful candidates in this year's School Leaving Certificate Examination.
Courses of Action:
The government should make arrangements to increase number of seats of intermediate courses in existing colleges.
The government should take active steps to open new colleges to accommodate all these successful candidates.

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:
The government should immediately start food for work programme in the district to put a halt to the exodus.
The government should make since efforts to provide drinking/potable water to these districts

6) **Statement:** If the retired Professors of the same Institutes are also invited to deliberate on restructuring of the organization, their contribution may be beneficial to the Institute.
Courses of Action:
Management may seek opinion of the employees before calling retired professors.
Management should involve experienced people for the systematic restructuring of the organization.

7) **Statement:** The sale of a particular product has gone down considerably causing great concern to the company.
Courses of Action:
The company should make a proper study of rival products in the market.
The price of the product should be reduced and quality improved.

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:
India should use financial assistance from other international financial organizations to develop such ports in other places.
India should not seek such financial assistance from the international financial agencies.

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:
In an effort to attract talent, the Doordarshan has decided to revise its fee structure for the artists.
The fee structure should not be revised until other electronic media also revise it.

10) **Statement:** The Minister said that the teachers are still not familiarized 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:
Population education programme should be included in the college curriculum.
Orientation programme should be conducted for teachers on population education

11) **Statement:** A recent study shows that children below five die in the cities of the developing countries mainly from diarrhea and parasitic intestinal worms.
Courses of Action:
Governments of the developing countries should take adequate measures to improve the hygienic conditions in the cities.
Children below five years in the cities of the developing countries need to be kept under periodic medical check-up.

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:
The farmers should seek measures to control the attack of insects to protect their crops next year.
The Government should increase the support price of kharif crops considerably to protect the economic interests of farmers.

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:
People should make their arrangement of lunch and snacks while going for car XYZ's booking and be ready to spend several hours.
Arrangement should be made for more booking desks and increased business hours to serve more people in less time.

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:
Efforts should be made to effectively implement the Act.
The cases of punishment should be propagated through mass media so that more people become aware of the stern actions.

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:
Curriculum should be reviewed and revised periodically.
System of education should be made more flexible.

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:
CBI should try to catch the officer red-handed and then take a strict action against him.
CBI should wait for some more complaints about the officer to be sure about the matter.

17) **Statement:** The Indian electronic component industry venturing into the West European markets faces tough competition from the Japanese.
Courses of Action:
India should search for other international markets for its products.
India should improve the quality of the electronic components to compete with the Japanese in capturing these markets.

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:
Other neighbouring states should set up such control boards.
The proposed control board should not be allowed to function as such joint boards are always ineffective.

19) **Statement:** The Government has decided not to provide financial support to voluntary organizations from next Five Year Plan and has communicated that all such organizations should raise funds to meet their financial needs.
Courses of Action:
Voluntary organizations should collaborate with foreign agencies.
They should explore other sources of financial support.

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:
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.
The fruit vendors should stop selling imported fruits. So that the demand for indigenous fruits would be increased.

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:**
   I. There is unprecedented increase in the number of young unemployed in comparison to the previous year.
   II. A large number of candidates submitted applications against an advertisement for the post of manager issued by a bank.

2) **Statements:**
   I. The police authority has recently caught a group of house breakers.
   II. The citizens groups in the locality have started night vigil in the area.

3) **Statements:**
   I. There is considerable reduction in the number of people affected by water-borne diseases in City A during this rainy season.
   II. The government has opened four new civil hospitals in City A in the beginning of the year.

4) **Statements:**
   I. The prices of vegetables have been increased considerably during this summer.
   II. There is tremendous increase in the temperature during this summer thereby damaging crops greatly.

5) **Statements:**
   I. 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.
   II. The university authorities have expressed their inability to provide grants to its constituent colleges.

6) **Statements:**
   I. The literacy rate in the district has been increasing for the last four years.
   II. The district administration has conducted extensive training programme for the workers involved in the literacy drive.

7) **Statements:**
   I. The school authority has asked the X Std. students to attend special classes to be conducted on Sundays.
   II. The parents of the X Std. students have withdrawn their wards from attending private tuitions conducted on Sundays.

8) **Statements:**
   I. The Government has imported large quantities of sugar as per trade agreement with other countries.
   II. The prices of sugar in the domestic market have fallen sharply in the recent months.

9) **Statements:**
   I. There is sharp decline in the production of oil seeds this year.
   II. The Government has decided to increase the import quantum of edible oil.

10) **Statements:**
   I. 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.
   II. The Government medical colleges have not increased their fees in spite of price escalation.

11) **Statements:**
   I. Large number of people living in the low-lying areas has been evacuated during the last few days to safer places.
   II. The Government has rushed in relief supplies to the people living in the affected areas.

12) **Statements:**
   I. It is the aim of the city's civic authority to get the air pollution reduced by 20% in the next two months.
   II. The number of asthma cases in the city is constantly increasing.

13) **Statements:**
   I. The local co-operative credit society has decided to stop giving loans to farmers with immediate effect.
   II. A large number of credit society members have withdrawn major part of their deposits from the credit society.

14) **Statements:**
   I. The employees of the biggest bank in the country have given an indefinite strike call starting from third of the next month.
   II. The employees of the Central Government have withdrawn their week long demonstrations.

15) **Statements:**
   I. Police resorted to lathi-charge to disperse the unlawful gathering of large number of people.
   II. The citizens' forum called a general strike in protest against the police atrocities.

16) **Statements:**
   I. Majority of the citizens in the locality belongs to higher income group.
   II. The sales in the local super market are comparatively much higher than in other localities.

17) **Statements:**

I. The life today is too fast, demanding and full of variety in all aspects which at times leads to stressful situations.

II. Number of suicide cases among teenagers is on increase.

18) **Statements:**

I. The government has decided to make all the information related to primary education available to the general public.

II. In the past, the general public did not have access to all these information related to primary education.

19) **Statements:**

I. The farmers have decided against selling their kharif crops to the Government agencies.

II. The Government has reduced the procurement price of kharif crops starting from last month to the next six months.

20) **Statements:**

I. The performance of most of the students in final exam of class X in the schools run by the Government was excellent.

II. Many teachers of the Government schools left the school and joined private schools.

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:

The same diet as in Hawaii should be propagated in Japan also.

Bowel cancer is less severe than stomach cancer.

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:

The employees of this company do not seem to have any additional undisclosed income besides their salary.

The employees union wants all senior officers to declare their income first.

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:

All the social development programmes should be evaluated.

There is a need to monitor the performance of workers.

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:

Women are not interested in other things.

An average woman's primary interest lies in home and especially in the kitchen.

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:

Transportation by sea is cheaper than that by road.

Fuel must be saved to the greatest extent

6) **Statements:** The manager humiliated Sachin in the presence of his colleagues.

Conclusions:

The manager did not like Sachin.

Sachin was not popular with his colleagues.

7) **Statements:** Women's organizations in India have welcomed the amendment of the Industrial Employment Rules 1946 to curb sexual harassment at the work place.

Conclusions:

Sexual harassment of women at work place is more prevalent in India as compared to other developed countries.

Many organizations in India will stop recruiting women to avoid such problems.

8) **Statements:** Nation X faced growing international opposition for its decision to explode eight nuclear weapons at its test site.

Conclusions:

The citizens of the nation favoured the decision. Some powerful countries do not want other nations to become as powerful as they are.

9) **Statements:** In a highly centralized power structure, in which even senior cabinet ministers are prepared to reduce themselves to pathetic countries or yes-men 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:
The Ministers play safe by not giving anti-government views.
The Prime Minister does not encourage his colleagues to render their own views.

10) **Statements:** National Aluminium Company has moved India from a position of shortage to self-sufficiency in the metal.
Conclusions:
Previously, India had to import aluminium.
With this speed, it can soon become a foreign exchange earner.

11) **Statements:** Reading makes a full man, conference a ready man and writing an exact man.
Conclusions:
Pointed and precise expression comes only through extensive writing.
Extensive reading makes a complete man.

12) **Statements:** Jade plant has thick leaves and it requires little water.
Conclusions:
All plants with thick leaves require little water.
Jade plants may be grown in places where water is not in abundance.

13) **Statements:** Use "Kraft" colors. They add color to our life. - An advertisement.
Conclusions:
Catchy slogans do not attract people.
People like dark colors.

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:
No political - prisoner had committed murder.
Some politicians were not arrested.

15) **Statements:** Modern man influences his destiny by the choice he makes unlike in the past.
Conclusions:
Earlier there were fewer options available to man.
There was no desire in the past to influence the destiny.

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:
The residents in these wards should economize on water on Friday.
The residents in these wards should store some water on the previous day.

17) **Statements:** People who speak too much against dowry are those who had taken it themselves.
Conclusions:
It is easier said than done.
People have double standards.

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:
Our national norm is appropriate.
The state's health system is taking adequate care in this regard.

19) **Statements:** Our securities investments carry market risk. Consult your investment advisor or agent before investing.
Conclusions:
One should not invest in securities.
The investment advisor calculates the market risk with certainty.

20) **Statements:** Money plays a vital role in politics.
Conclusions:
The poor can never become politicians.
All the rich men take part in politics.

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:
Yes. Rural people are creative.
Yes. This would help to solve the problem of unemployment to some extent

2) **Statement:** Should young entrepreneurs be encouraged?
Arguments:
Yes. They will help in industrial development of the country.
Yes. They will reduce the burden on employment market.

3) **Statement:** Should all the annual examinations up to Std. V be abolished?
Arguments:
Yes. The young students should not be burdened with such examinations which hampers their natural growth.
No. The students will not study seriously as they will get automatic promotion to the next class and this will affect them in future.

4) **Statement:** Should Indian scientists working abroad be called back to India?
Arguments:
Yes. They must serve the motherland first and forget about discoveries, honours, facilities and all.
No. We have enough talent; let them stay where they want.

5) **Statement:** Should we scrap the system of formal education beyond graduation?
Arguments:
Yes. It will mean taking employment at an early date.
No. It will mean lack of depth of knowledge.

6) **Statement:** Should there be an upper age limit of 65 years for contesting Parliamentary/ Legislative Assembly elections?
Arguments:
Yes. Generally, people above the age of 65 lose their dynamism and will power.
No. The life span is so increased that people remain physically and mentally active even up to the age of 80.

7) **Statement:** Should new big industries be started in Mumbai?
Arguments:
Yes. It will create job opportunities.
No. It will further add to the pollution of the city.

8) **Statement:** Should high chimneys be installed in industries?
Arguments:
Yes. It reduces pollution at ground level.
No. It increases pollution in upper atmosphere.

9) **Statement:** Does India need so many plans for development?
Arguments:
Yes. Nothing can be achieved without proper planning.
No. Too much time, money and energy is wasted on planning.

10) **Statement:** Should articles of only deserving authors be allowed to be published?
Arguments:
Yes. It will save a lot of paper which is in short supply.
No. It is not possible to draw a line between the deserving and the undeserving.

11) **Statement:** Should colleges be given the status of a university in India?
Arguments:
Yes. Colleges are in a better position to assess the student's performance and therefore the degrees will be more valid.
No. It is Utopian to think that there will not be nepotism and corruption in awarding degrees by colleges.

12) **Statement:** Should the prestigious people who have committed crime unknowingly, be met with special treatment?
Arguments:
Yes. The prestigious people do not commit crime intentionally.
No. It is our policy that everybody is equal before the law.

13) **Statement:** Can pollution be controlled?
Arguments:
Yes. If everyone realizes the hazards it may create and cooperates to get rid of it, pollution may be controlled.
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.

14) **Statement:** Should the railways in India be privatized in a phased manner like other public sector enterprises?
Arguments:
Yes. This is the only way to bring in competitiveness and provide better services to the public.
No. This will pose a threat to the national security of our country as multinationals will enter into the fray.

15) **Statement:** Should internal assessment in colleges be abolished?
Arguments:
Yes. This will help in reducing the possibility of favouritism.
No, teaching faculty will lose control over students.

16) **Statement:** Should all the unauthorized structures in the city be demolished?
Arguments:
No. Where will the people residing in such houses live?
Yes. This will give a clear message to general public and they will refrain from constructing unauthorized buildings.

17) **Statement:** Should there be a maximum limit for the number of ministers in the Central Government?
Arguments:
No. The political party in power should have the freedom to decide the number of ministers to be appointed.
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.

18) **Statement:** Should foreign films be banned in India?
Arguments:
Yes. They depict an alien culture which adversely affects our values.
No. Foreign films are of a high artistic standard.

19) **Statement:** Is buying things on installments profitable to the customer?
Arguments:
Yes. He has to pay less.
No, paying installments upsets the family budget.

20) **Statement:** Should Doordarshan be given autonomous status?
Arguments:
Yes. It will help Doordarshan to have fair and impartial coverage of all important events.
No. The coverage of events will be decided by a few who may not have healthy outlook.

CREATIVITY APTITUDE

VENN DIAGRAMS

INTRODUCTION

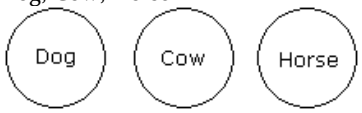
The main aim of this section is to test your ability about the relation between some items of a group by diagrams. In these questions some figures of circles and some words are given. You have to choose a figure which represents the given words.

Some critical examples are given below:

Example 1:

If all the words are of different groups, then they will be shown by the diagram as given below.

Dog, Cow, Horse

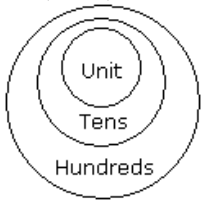


All these three are animals but of different groups, there is no relation between them. Hence they will be represented by three different circles.

Example 2:

If the first word is related to second word and second word is related to third word. Then they will be shown by diagram as given below.

Unit, Tens, Hundreds

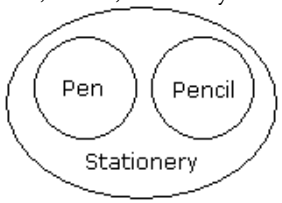


Ten units together make one Tens or in one tens, whole unit is available and ten tens together make one hundreds.

Example 3:

If two different items are completely related to third item, they will be shown as below.

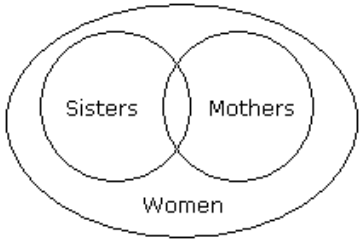
Pen, Pencil, Stationery



Example 4:

If there is some relation between two items and these two items are completely related to a third item they will be shown as given below.

Women, Sisters, Mothers



Some sisters may be mothers and vice-versa. Similarly some mothers may not be sisters and vice-versa. But all the sisters and all the mothers belong to women group.

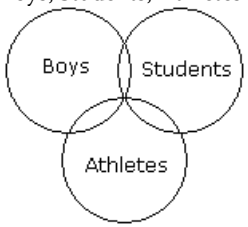
Example 5:

Two items are related to a third item to some extent but not completely and first two items totally different.

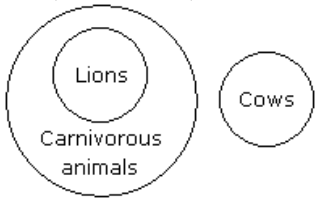
Students, Boys, Girls

The boys and girls are different items while some boys may be students. Similarly among girls some may be students.

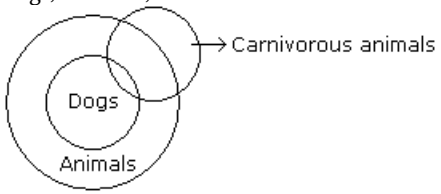
Example 6:
All the three items are related to one another but to some extent not completely.
Boys, Students, Athletes



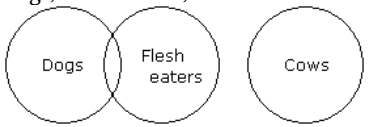
Some boys may be students and vice-versa. Similarly some boys may be athletes and vice-versa. Some students may be athletes and vice-versa.
Example 7:
Two items are related to each other completely and third item is entirely different from first two.
Lions, Carnivorous, Cows



All the lions are carnivorous but no cow is lion or carnivorous.
Example 8:
First item is completely related to second and third item is partially related to first and second item.
Dogs, Animals, Flesh-eaters



All the dogs are belonging to animals but some dogs are flesh eater but not all.
Example 9:
First item is partially related to second but third is entirely different from the first two.
Dogs, Flesh-eaters, Cows



Some dogs are flesh-eaters but not all while any dog or any flesh-eater cannot be cow

EXERCISES

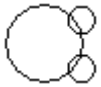
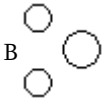
1) Which of the following diagrams indicates the best relation between Author, Lawyer and Singer ?

A. 
B. 
C. 
D. 

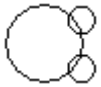
2) Which of the following diagrams indicates the best relation between Judge, Thieves and Criminals ?

A. 
B. 
C. 
D. 

3) Which of the following diagrams indicates the best relation between Iron, Lead and Nitrogen ?

A 
B 
C 
D 

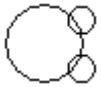
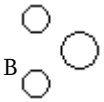
4) Which of the following diagrams indicates the best relation between Pigeon, Bird and Dog ?

A 
B 
C 
D 

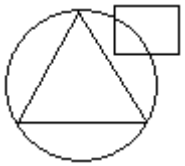
5) Which of the following diagrams indicates the best relation between Earth, Sea and Sun ?

A 
B 
C 
D 

6) Which of the following diagrams indicates the best relation between Hockey, Football and Cricket ?

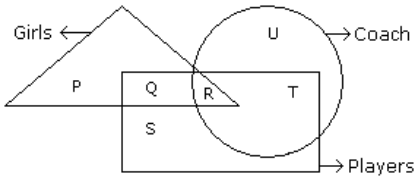
A 
B 
C 
D 

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 ?



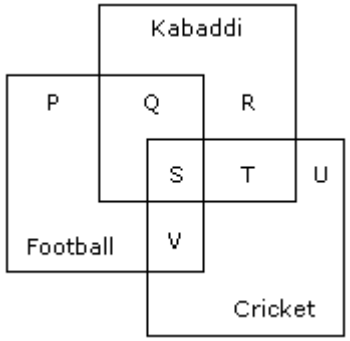
A. Environmentalists
B. Legal Experts
C. Engineers with legal background
D. Environmentalists with Engineering backgro

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?



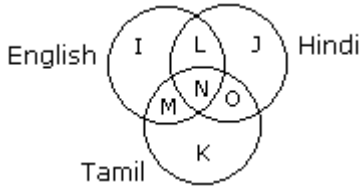
A.P B.Q C.R D.S

9) The diagram given below represents those students who play Cricket, Football and Kabaddi.



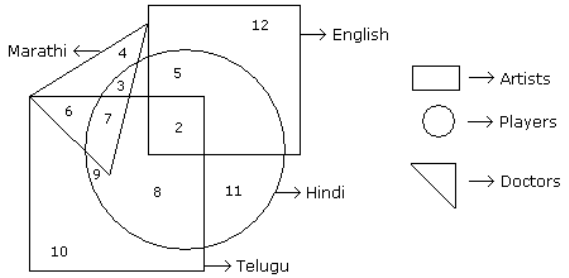
Study the diagram and identify the students who play all the three games.
A.P + Q + R B.V + T
C.S + T + V D.S

10) Study the diagram and identify the people who can speak only one language.



A.L + M + O B.K + J + I
C.K D.I

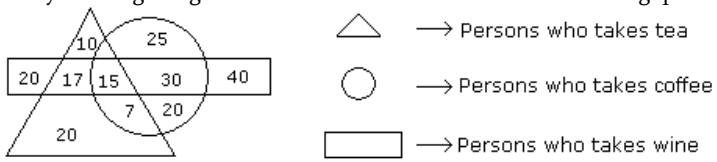
11) In the following figure Small Square represents the persons who know English, triangle to those who know Marathi, big square to those who know Telugu and circle to those who know Hindi. In the different regions of the figures from 1 to 12 are given



How many persons can speak English and Hindi both the languages only ?
A. 5 B. 8
C. 7 D. 18

How many persons can speak Marathi and Telugu both ?
A. 10 B. 11
C. 13 D. None of these

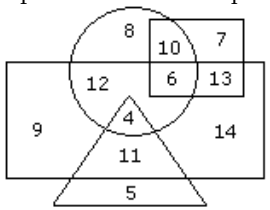
12) Study the diagram given below and answer each of the following questions.



How many persons who take tea and wine but not coffee ?
A. 20 B. 17
C. 25 D. 15

How many persons are there who take both tea and coffee but not wine ?
A. 22 B. 17
C. 7 D. 20

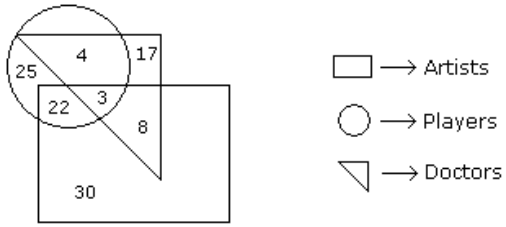
13) In the following diagram rectangle represents men, Triangle represents educated, Circle represents urban and square represents government employees.



Which one of the following represents the educated men but not urban ?
A. 9 B. 5
C. 4 D. 11

Which one of the following represents a woman who is urban as well as government employee ?
A. 7 B. 13
C. 10 D. 6

14) Study the following figure and answer the questions given below.



How many doctors are neither artists nor players ?

A. 17 B. 5

C. 10 D. 30

How many doctors are both players and artists ?

A. 22 B. 8

C. 3 D. 30

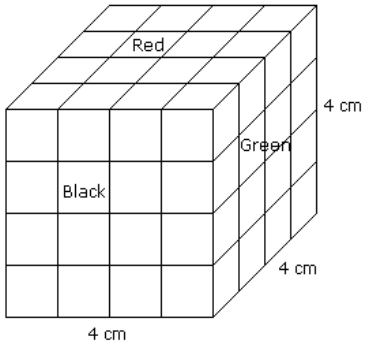
CUBE AND CUBOIDS

INTRODUCTION

- In a cube or a cuboid there are six faces in each.
- In a cube length, breadth and height are same while in cuboid these are different.
- In a cube the number of unit cubes = $(side)^3$.
- In cuboid the number of unit cube = (l x b x h).

Example:

A cube of each side 4 cm, has been painted black, red and green on pars of opposite faces. It is then cut into small cubes of each side 1 cm.



The following questions and answers are based on the information give above:

1. How many small cubes will be there?

Total no. of cubes = $(sides)^3 = (4)^3 = 64$

2. How many small cubes will have three faces painted?

From the figure it is clear that the small cube having three faces colored are situated at the corners of the big cube because at these corners only three faces of the big cube meet.

Therefore the required number of such cubes is always 8, because there are 8 corners.

3. How many small cubes will have only two faces painted?

From the figure it is clear that to each edge of the big cube 4 small cubes are connected and two out of them are situated at the corners of the big cube which have all three faces painted.

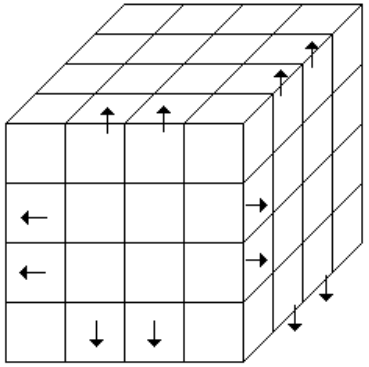
Thus, to edge two small cubes are left which have two faces painted. As the total no. of edges in a cube are 12.

Hence the no. of small cubes with two faces colored = 12 x 2 = 24

(or)

No. of small cubes with two faces colored = (x - 2) x No. of edges

where x = (side of big cube / side of small cube)

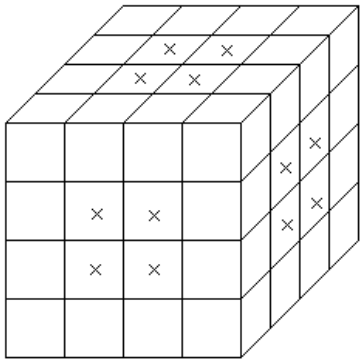


4. How many small cubes will have only one face painted?

The cubes which are painted on one face only are the cubes at the centre of each face of the big cube.

Since there are 6 faces in the big cube and each of the face of big cube there will be four small cubes.

Hence, in all there will be 6 x 4 = 24 such small cubes (or) $(x - 2)^2$ x 6.



5. How many small cubes will have no faces painted?

No. of small cubes will have no faces painted = No. of such small cubes

$= (x - 2)^3$ [Here $x = (4/1) = 4$]

$= (4 - 2)^3$

$= 8$.

6. How many small cubes will have only two faces painted in black and green and all other faces unpainted ?

There are 4 small cubes in layer II and 4 small cubes in layer III which have two faces painted green and black.

Required no. of such small cubes = 4 + 4 = 8.

7. How many small cubes will have only two faces painted green and red?

No. of small cubes having two faces painted green and red = 4 + 4 = 8.

8. How many small cubes will have only two faces painted black and red?

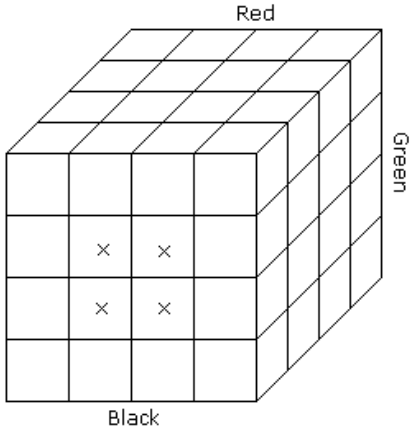
No. of small cubes having two faces painted black and red = 4 + 4 = 8.

9. How many small cubes will have only black painted?

No. of small cubes having only black paint. There will be 8 small cubes which have only black paint. Four cubes will be form one side and 4 from the opposite side.

10. How many small cubes will be only red painted?

No. of small cubes having only red paint = 4 + 4 = 8.



11. How many small cubes will be only green painted?

No. of small cubes having only green paint = 4 + 4 = 8.

12. How many small cubes will have at least one face painted?

No. of small cubes having at least one face painted = No. of small cubes having 1 face painted + 2 faces painted + 3 faces painted

= 24 + 24 + 8

= 56.

13. How many small cubes will have at least two faces painted?

No. of small cubes having at least two faces painted = No. of small cubes having two faces painted + 3 faces painted

= 24 + 8

= 32.

EXERCISES

1) The following questions are based on the information given below:

1. There is a cuboid whose dimensions are 4 x 3 x 3 cm.
2. The opposite faces of dimensions 4 x 3 are colored yellow.
3. The opposite faces of other dimensions 4 x 3 are colored red.
4. The opposite faces of dimensions 3 x 3 are colored green.
5. Now the cuboid is cut into small cubes of side 1 cm.

How many small cubes will have only two faces colored?

A. 12 B. 24
C. 16 D. 12

How many small cubes have three faces colored?

A. 24 B. 20
C. 16 D. 8

How many small cubes will have no face colored?

A. 1 B. 2
C. 4 D. 8

How many small cubes will have only one face colored?

A. 10 B. 12
C. 14 D. 18

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 cm x 4 cm are colored in red.
3. Two faces measuring 4 cm x 3 cm are colored in blue.
4. Two faces measuring 5 cm x 3 cm are colored in green.
5. Now the block is divided into small cubes of side 1 cm each.

How many small cubes will have will have three faces colored ?

A. 14 B. 8
C. 10 D. 12

How many small cubes will have only one face colored ?

A. 12 B. 28
C. 22 D. 16

How many small cubes will have no faces colored ?

A. None B. 2
C. 4 D. 6

How many small cubes will have two faces colored with red and green colors ?

A. 12 B. 8

C. 16 D. 20

3) The following questions are based on the information given below:

1. All the faces of cubes are painted with red color.
2. The cubes are cut into 64 equal small cubes.

How many small cubes have only one face colored ?

A. 4 B. 8
C. 16 D. 24

How many small cubes have no faces colored ?

A. 24 B. 8
C. 16 D. 0

How many small cubes are there whose three faces are colored ?

A. 4 B. 8
C. 16 D. 24

How many small cubes are there whose two adjacent faces are colored red ?

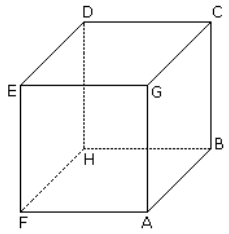
A. 0 B. 8
C. 16 D. 24

DICE

INTRODUCTION:

Dice is a cube. In cube there are 6 faces. Some important points are given below:

1. There are 6 faces in the cube - ABCG, GCDE, DEFH, BCDH, AGEF and ABHF.



2. Always four faces are adjacent to one face.
3. Opposite of ABCG is DEFH and so on.
4. CDEG is the upper face of the cube.
5. ABHF is the bottom of the cube.

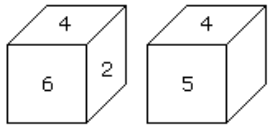
There are certain rules with the help of these rules question on dice can easily determined.

Rule No. 1:

Two opposite faces cannot be adjacent to one another.

Example:

Two different positions of a dice are shown below. Which number will appear on the face opposite to the face with number 4?



Solution:

Faces with four numbers 6, 2, 5 and 3 are adjacent of to the face with No. 4.

Hence the faces with no. 6, 2, 5 and 3 cannot be opposite to the face with no. 4.

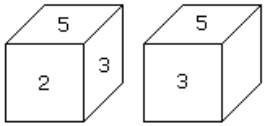
Therefore the remaining face with no.1 will be the opposite of the face with no. 4.

Rule No. 2:

If two different positions of a dice are shown and one of the two common faces is in the same position then of the remaining faces will be opposite to each other.

Example:

Two different positions of a dice are shown below.



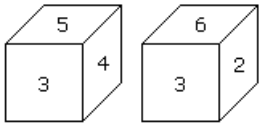
Here in both shown positions two faces 5 and 3 are common.

The remaining faces are 2 and 4.

Hence the number on the face opposite to the face with number 2 is 4.

Rule No. 3:

If in two different positions of dice, the position of a common face be the same, then each of the opposite faces of the remaining faces will be in the same position.



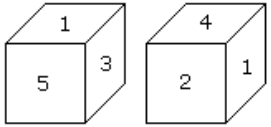
Here in both positions of common (3) is same.

Therefore, opposite of 5 is 6 and opposite of 4 is 2.

Rule No. 4:

If in two different positions of a dice, the position of the common face be not the same, then opposite face of the common face will be that which is not shown on any face in these two positions. Besides, the opposite faces of the remaining faces will not be the same.

Example:



Here in two positions of a dice the face with number 1 is not in the same position.

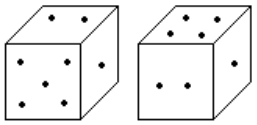
The face with number 6 is not shown.

Hence the face opposite to the face with number 1 is 6.

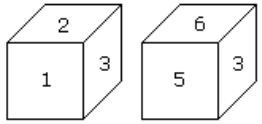
Besides the opposite face of 3 will be the face with number 2 and opposite face to face 5 will be the face with number 1.

EXERCISES

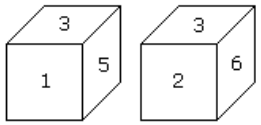
1) Two positions are dice are shown below. How many points will appear on the opposite to the face containing 5 points?



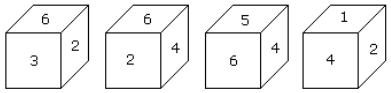
2) Which digit will appear on the face opposite to the face with number 4?



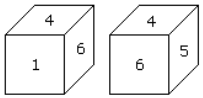
3) Two positions of a dice are shown below. Which number will appear on the face opposite to the face with the number 5?



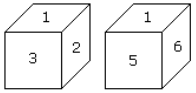
4) Which number is on the face opposite to 6?



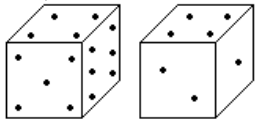
5) Two positions of a dice are shown below. When number '1' is on the top. What number will be at the bottom?



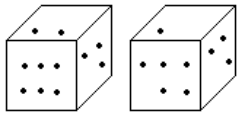
6) Two positions of a cube with its surfaces numbered are shown below. When the surface 4 touch the bottom, what surface will be on the top?



7) Here two positions of dice are shown. If there are two dots in the bottom, then how many dots will be on the top?

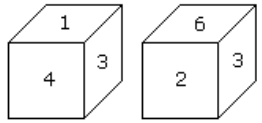


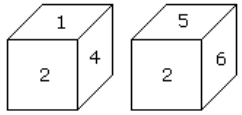
8) Two positions of dice are shown below. How many points will be on the top when 2 points are at the bottom?



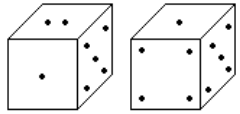
9) Two positions of a cubical block are shown. When 5 is at the top which number will be at bottom?

10) When the digit 5 is on the bottom then which number will be on its upper surface?

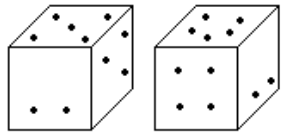




11) Observe the dots on the dice (one to six dots) in the following figures. How many dots are contained on the face opposite to the containing four dots?



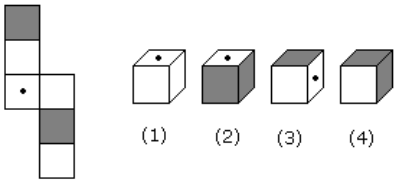
12) Two positions of a dice are shown below. Whe
are at the bottom, how many points will be at th



13) 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 are similar to the box formed.

A. 2 and 3 only B. 1, 3 and 4 only

C. 2 and 4 only D. 1 and 4 only

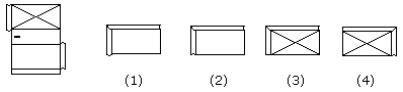


14) A. 1 and 4 only B. 3 and 4 only

C. 1 and 2 only D. 2 and 3 only

15) A. 1 only B. 2 only

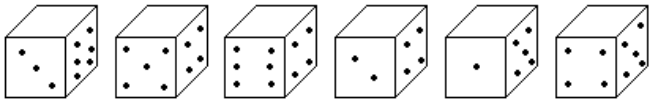
C. 3 only D. 4 only



16) A. 1 and 3 only B. 2 and 4 only

C. 2 and 3 only D. 1, 2, 3 and 4

17) Six dice with upper faces erased are as shows.



The sum of the numbers of dots on the opposite face is 7.

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

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

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 there two sets?

A. 0 B. 2
C. 4 D. 6

If the even numbers of 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

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

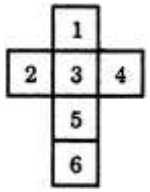
CUBES AND DICE

INTRODUCTION

Construction of Boxes:

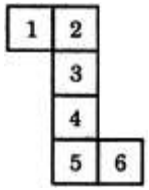
The details of the cube formed when a sheet is folded to form a box:

Form I



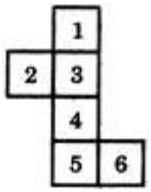
In this case:
1 lies opposite 5;
2 lies opposite 4;
3 lies opposite 6.

Form II



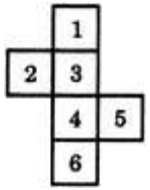
In this case:
1 lies opposite 6;
2 lies opposite 4;
3 lies opposite 5.

Form III



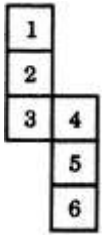
In this case:
1 lies opposite 4;
2 lies opposite 6;
3 lies opposite 5.

Form IV



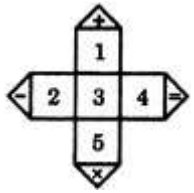
In this case:
1 lies opposite 4;
2 lies opposite 5;
3 lies opposite 6.

Form V



In this case:
1 lies opposite 3;
2 lies opposite 5;
4 lies opposite 6.

Form VI



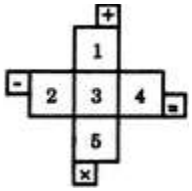
In this case:

will be the one of the faces of the cube and it lies opposite 3;
2 lies opposite 4;
1 lies opposite 5.

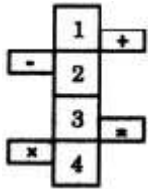
Form VII

In this case:

will be the one of the faces of the cube and it lies opposite 3;
2 lies opposite 4;
1 lies opposite 5.



Form VIII



In this case:

 and  are two faces of the cube that lie opposite to each other.

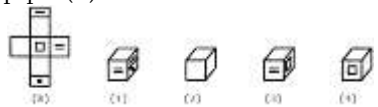
1 lies opposite 3;

2 lies opposite 4;

EXERCISES

1) Choose the box that is similar to the box formed from the given sheet of paper (X).

2) Choose the box that is similar to the box formed from the given sheet of paper (X).

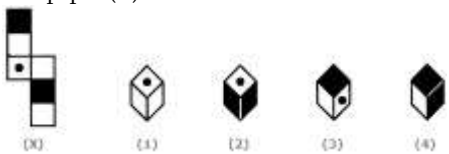


3) Choose the box that is similar to the box formed from the given sheet of paper (X).

4) Choose the box that is similar to the box formed from the given sheet of paper (X).

5) Choose the box that is similar to the box formed from the given sheet of paper (X).

6) Choose the box that is similar to the box formed from the given sheet of paper (X).

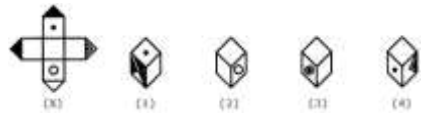


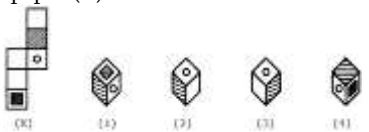
7) Choose the box that is similar to the box formed from the given sheet of paper (X).

8) Choose the box that is similar to the box formed from the given sheet of paper (X).

9) Choose the box that is similar to the box formed from the given sheet of paper (X).

10) Choose the box that is similar to the box formed from the given sheet of paper (X).



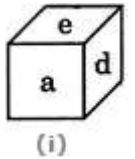


11) Four usual dice are thrown on the ground. The total of numbers on the top faces of these four dice is 13 as the top faces showed 4, 3, 1 and 5 respectively. What is the total of the faces touching the ground?

A. 12 B. 13

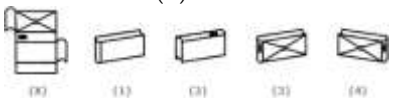
C. 15 D. Cannot be determined

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?

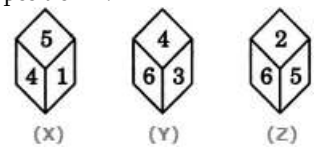


(i)

13) Which of the following finished patterns can be obtained from the piece of cardboard (X) shown below?



14) Three different positions X, Y and Z of a dice are shown in the figures given below. Which numbers are hidden behind the numbers 6 and 5 in the position Z?



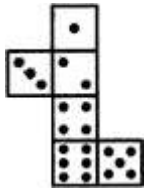
(X) (Y) (Z)

15) A dice is numbered from 1 to 6 in different ways. If 2 is opposite to 3 and adjacent to 4 and 6, then which of the following statements is necessarily true?

A. 1 is opposite to 5 B. 4 is opposite to 6

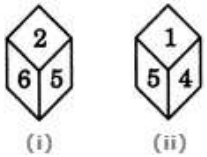
C. 4 is adjacent to 2 and 6 D. 1 is adjacent to 2 and 3

16) When the following figure is folded to form a cube, how many dots lie opposite the face bearing five dots?

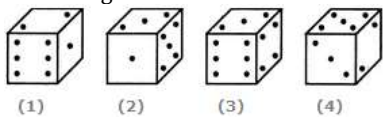


17) Choose the box that is similar to the box formed from the given sheet of paper (X).

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.

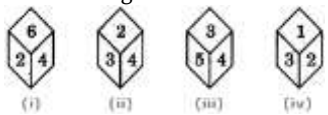


25) If the total number of dots on opposite faces of a cubical block is always 7, find the figure which is correct.

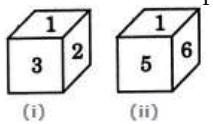


19) Three different positions of a dice are shown below. How many dots lie opposite 2 dots?

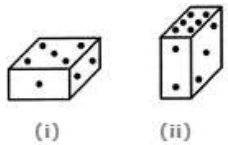
20) A dice is thrown four times and its four different positions are shown below. Find the number on the face opposite the face showing 2.



21) Two positions of a dice are shown. When 4 is at the bottom, what number will be on the top?



22) Two positions of a parallelepiped are shown below. When the number 3 will be on the top side, then which number will be at the bottom?



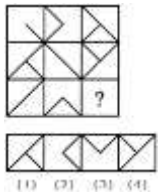
25) A dice is numbered from 1 to 6 in different ways. If 1 is adjacent to 2, 3 and 5, then which of the following statements is necessarily true?

A. 4 is adjacent to 6
B. 2 is adjacent to 5
C. 1 is adjacent to 6
D. 1 is adjacent to 4

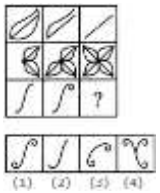
FIGURE MATRIX

EXERCISES

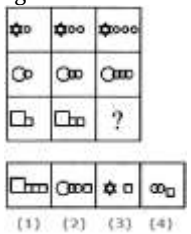
1) Select a suitable figure from the four alternatives that would complete the figure matrix.



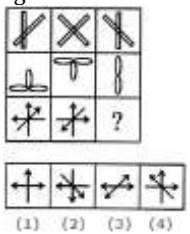
2) Select a suitable figure from the four alternatives that would complete the figure matrix.



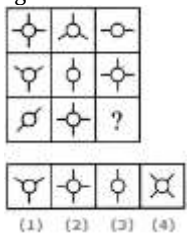
3) Select a suitable figure from the four alternatives that would complete the figure matrix.



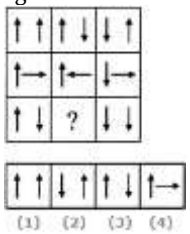
4) Select a suitable figure from the four alternatives that would complete the figure matrix.



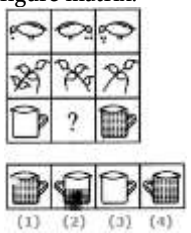
5) Select a suitable figure from the four alternatives that would complete the figure matrix.



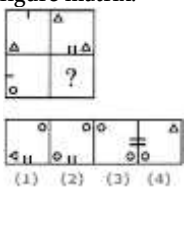
6) Select a suitable figure from the four alternatives that would complete the figure matrix.



7) Select a suitable figure from the four alternatives that would complete the figure matrix.

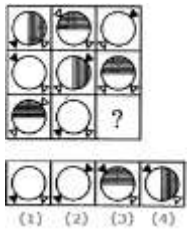


8) Select a suitable figure from the four alternatives that would complete the figure matrix.

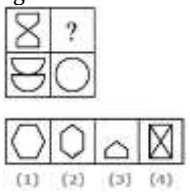


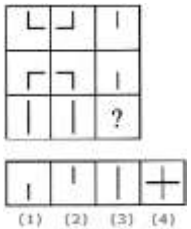
9) Select a suitable figure from the four alternatives that would complete the figure matrix.

10) Select a suitable figure from the four alternatives that would complete the figure matrix.

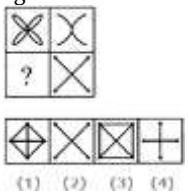


11) Select a suitable figure from the four alternatives that would complete the figure matrix.

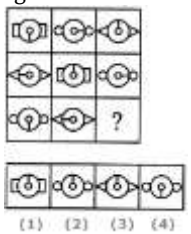




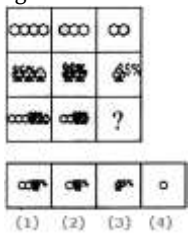
12) Select a suitable figure from the four alternatives that would complete the figure matrix.



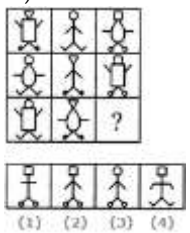
14) Select a suitable figure from the four alternatives that would complete the figure matrix.



15) Select a suitable figure from the four alternatives that would complete the figure matrix.



16) Select a suitable figure from the four alternatives that would complete the figure matrix.



SEATING ARRANGEMENT

INTRODUCTION

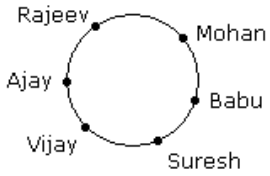
In order to solve seating arrangement questions, first of all diagram should be made. By doing so questions are easily and quickly solved.

Example 1:

1. 6 Boys are sitting in a circle and facing towards the centre of the circle.
2. Rajeev is sitting to the right of mohan but he is not just at the left of Vijay.
3. Suresh is between Babu and Vijay.
4. Ajay is sitting to the left of Vijay.

Who is sitting to the left of Mohan ?

Solution :



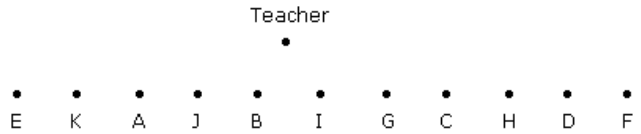
Hence, Babu is sitting to the left of Mohan.

Example 2:

1. Eleven students A, B, C, D, E, F, G, H, I, J and K are sitting in first line facing to the teacher.
2. D who is just to the left of F, is to the right of C at second place.
3. A is second to the right of E who is at one end.
4. J is the nearest neighbour of A and B and is to the left of G at third place.
5. H is next to D to the right and is at the third place to the right of I.

Who is just in the middle ?

Solution :



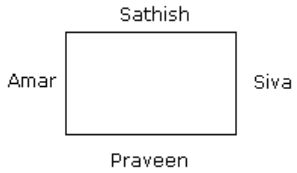
Hence, I is just in the middle.

Example 3:

Siva, Sathish, Amar and Praveen are playing cards. Amar into the right of Sathish, who is to the right of Siva.

Who is to the right of Amar ?

Solution :



Hence Praveen is to the right of Amar.

Example 4:

1. A, B and C are three boys while R, S and T are three girls. They are sitting such that the

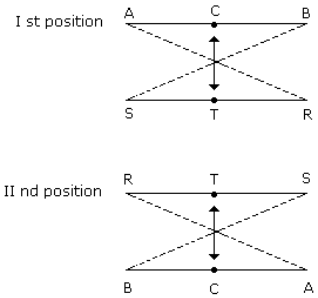
boys are facing the girls.

2. A and R are diagonally opposite to each other.
3. C is not sitting at any of the ends.
4. T is left to R but opposite to C.

(A). Who is sitting opposite to B ?

(B). Who is sitting diagonally opposite to B ?

Solution :



(A). Hence, R is sitting opposite to B. (B). Hence, S is sitting diagonally opposite to B.

1) 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

If P and R interchange their positions then which of the following pair will sit together?

A.RT B.PV C.VR D.QV

3) A, B, C, D, E, F and G are sitting in a row facing North : F is to the immediate right of E. E is 4th to the right of G. C is the neighbour of B and D. Person who is third to the left of D is at one of ends.

Who are to the left of C?

A.Only B B.G, B and D

C.G and B D.D, E, F and A

Who are the neighbours of B?

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.

How many girls are there out of these 7 students A.3 B.3 or 4 C.4 D.Data inadequate

Which of the following is the group of girls?

A.BAC B.BFC C.BCD D.CDF

4) 8 persons E, F, G, H, I, J, K and L are seated around a square table - two on each side. There are 3 ladies who are not seated next to each other. J is between L and F. G is between I and F. H, a lady member is second to the left of J. F, a male member is seated opposite to E, a lady member. There is a lady member between F and I.

A.C and D B.C and G

C.G and F D.C and E

Who among the following is to the immediate left of F?

A.G B.I C.J D.H

How many persons are seated between K and F?

A.1 B.2 C.3 D.4

5) A, B, C, D, E, F and G are sitting in a row facing North F is to the immediate right of E. E is 4th to the right of G. C is the neighbour of B and D. Person who is third to the left of D is at one of ends.

Who are to the left of C?

A. Only B B. G, B and D

C. G and B D. D, E, F and A

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

7) 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. B who is just next to the left of D, is opposite to Q. C and N are diagonally opposite to each other. E is opposite to O who is just next right of M. P who is just to the left of Q, is opposite to D. M is at one end of the line.

Who is sitting third to the right of O?

A. Q B. N C. M D. Data inadequate

Which of the following pair is diagonally opposite to each other?

A. EQ B. BO C. AN D. AM

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

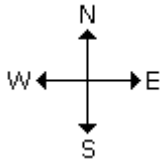
Who is the fourth person to the left of Q?

A. P B. U C. R D. Data inadequate

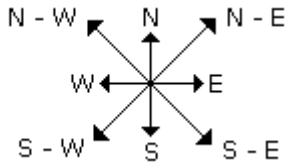
DIRECTION SENSE TEST

INTRODUCTION

There are four main directions - East, West, North and South as shown below:



There are four cardinal directions - North-East (N-E), North-West (N-W), South-East (S-E), and South-West (S-W) as shown below:

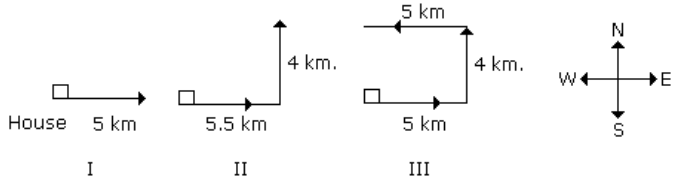


1. At the time of sunrise if a man stands facing the east, his shadow will be towards west.
2. At the time of sunset the shadow of an object is always in the east.
3. If a man stands facing the North, at the time of sunrise his shadow will be towards his left and at the time of sunset it will be towards his right.
4. At 12:00 noon, the rays of the sun are vertically downward hence there will be no shadow.

Main types of questions are given below:

Type 1:

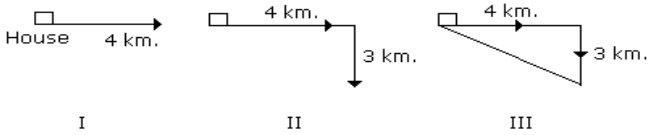
Siva starting from his house, goes 5 km in the East, then he turns to his left and goes 4 km. Finally he turns to his left and goes 5 km. Now how far is he from his house and in what direction?



From third position it is clear he is 4 km from his house and is in North direction.

Type 2:

Suresh starting from his house, goes 4 km in the East, then he turns to his right and goes 3 km. What minimum distance will be covered by him to come back to his house?



$$\text{Minimum distance} = \sqrt{(4)^2 + (3)^2}$$

$$= \sqrt{16 + 9}$$

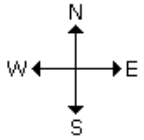
$$= \sqrt{25}$$

$$= 5 \text{ km.}$$

Type 3:

One morning after sunrise Juhi while going to school met Lalli at Boring road crossing. Lalli's shadow was exactly to the right of Juhi. If they were face to face, which direction was Juhi facing?

In the morning sunrises in the east.

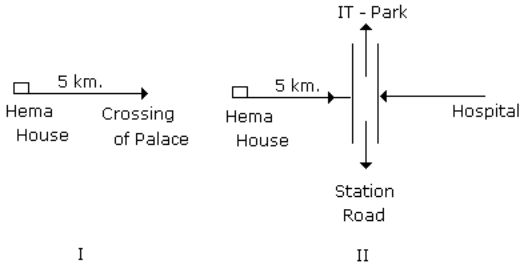


So in morning the shadow falls towards the west.

Now Lalli's shadow falls to the right of the Juhi. Hence Juhi is facing South.

Type 4:

Hema starting from her house walked 5 km to reach the crossing of Palace. In which direction she was going, a road opposite to this direction goes to Hospital. The road to the right goes to station. If the road which goes to station is just opposite to the road which IT-Park, then in which direction to Hema is the road which goes to IT-Park?



From II it is clear that the road which goes to IT-Park is left to Hema.

EXERCISES

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?

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?

3) If South-East becomes North, North-East becomes West and so on. What will West become?

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?

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

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.?

turns left and walks 15 m. In which direction and how many metres is he from the starting position?

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?

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?

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?

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?

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?

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?

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?

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?

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?

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?

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 135o and to cover 30 m. In which direction should he go?

18) X started to walk straight towards south. After walking 5 m he turned to the left and walked 3 m. After this he turned to the right and walked 5 m now to which direction X is facing?

19) Dev, Kumar, Nilesh, Ankur and Pintu are standing facing to the North in a playground such as given below:
Kumar is at 40 m to the right of Ankur.
Dev is are 60 m in the south of Kumar.
Nilesh is at a distance of 25 m in the west of Ankur.
Pintu is at a distance of 90 m in the North of Dev.

1. Which one is in the North-East of the person. Who is to the left of Kumar?
A. Dev B. Nilesh C. Ankur D. Pintu
2. If a boy starting from Nilesh, met to Ankur and then to Kumar and after this he to Dev and then to Pintu and whole the time he walked in a straight line, then how much total distance did he cover?
A. 215 m B. 155 m C. 245 m D. 185 m

20) Six flats on a floor in two rows facing North and South are allotted to P, Q, R, S, T and U.
Q gets a North facing flat and is not next to S.
S and U get diagonally opposite flats.
R next to U, gets a south facing flat and T gets North facing flat.

1. If the flats of P and T are interchanged then whose flat will be next to that of U?
A. P B. Q C. R D. T
2. Which of the following combination get south facing flats?
A. QTS B. UPT C. URP D. Data is inadequate
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
4. Whose flat is between Q and S?
A. T B. U C. R D. P

21) 8-trees → mango, guava, papaya, pomegranate, lemon, banana, raspberry and apple are in two rows 4 in each facing North and South.
Lemon is between mango and apple but just opposite to guava.
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.
Raspberry tree which at one end of a line, is just diagonally opposite to mango tree.

Which tree is just opposite to raspberry tree?
A. Papaya B. Pomegranate
C. Papaya or Pomegranate D. Data is

22) A # B means B is at 1 metre to the right of A. A $ B means B is at 1 metre to the North of A. A * B means B is at 1 metre to the left of A. A @ B means B is at 1 metre to the south of A.

In each question first person from the left is facing North.
According to X @ B * Y, Y is in which direction with respect to X?
A. North B. South
C. North-East D. South-West
According to P # R $ A * U, in which direction is U with respect to P?
A. East B. West
C. North D. South

inadequate

Which tree is just opposite to banana tree?

A. Mango B. Pomegranate

C. Papaya D. Data is inadequate

CHARACTER PUZZLES

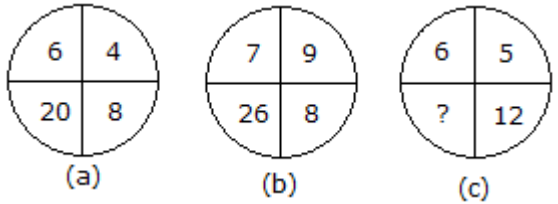
INTRODUCTION

In this type of questions, a figure or a matrix is given in which some numbers are filled according to a rule. A place is left blank. You have to find out a character (a number or a letter) from the given possible answers which may be filled in the blank space.

Some examples are given below.

Example 1:

Which number will replace the question mark?



Solution:

From fig. a: 6 + 4 + 8 = 18

18 + 2 = 20

From fig. b: 7 + 9 + 8 = 24

24 + 2 = 26

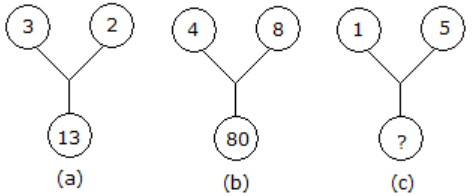
From fig. c: 6 + 5 + 12 = 23

23 + 2 = **25**

Hence the number **25** will replace the question mark.

Example 2:

Which number will replace the question mark?



Solution:

From fig. a: $(3)^2 + (2)^2 = 13$

From fig. b: $(4)^2 + (8)^2 = 80$

From fig. c: $? = (1)^2 + (5)^2$

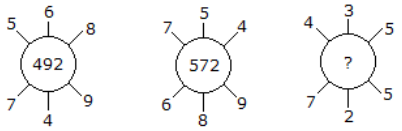
$? = 1 + 25$

$? = \mathbf{26}$

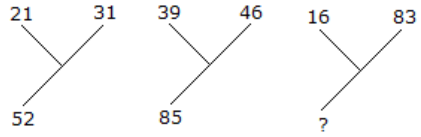
Hence the number **26** will replace the question mark.

EXERCISES

1) Which one will replace the question mark ?



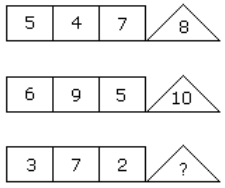
2) Which one will replace the question mark?



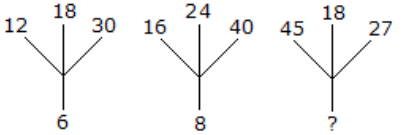
3) Which one will replace the question mark?

A_2	C_4	E_6
G_3	I_5	?
M_5	O_9	Q_{14}

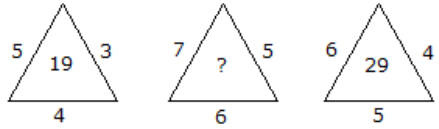
4) Which one will replace the question mark?



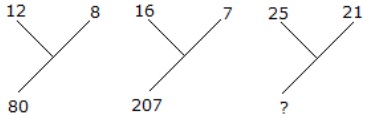
5) Which one will replace the question mark?



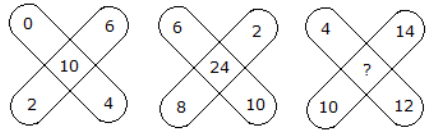
6) Which one will replace the question mark?



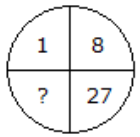
7) Which one will replace the question mark?



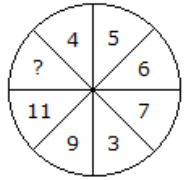
8) Which one will replace the question mark?



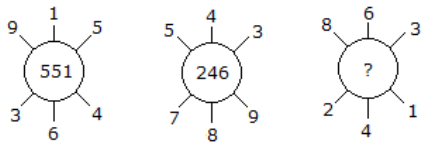
9) Which one will replace the question mark?



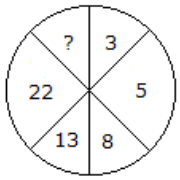
10) Which one will replace the question mark?



11) Which one will replace the question mark?



12) Which one will replace the question mark?



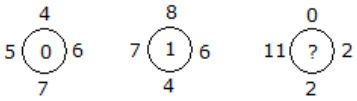
3) Which one will replace the question mark?

18	24	32
12	14	16
3	?	4
72	112	128

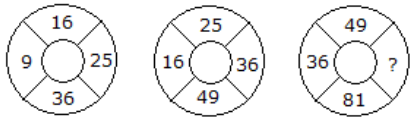
13) Which one will replace the question mark?

2	4	0
1	2	4
3	1	3
36	?	91

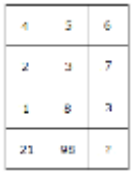
14) Which one will replace the question mark?



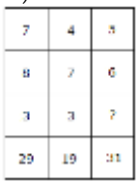
15) Which one will replace the question mark?



16) Which one will replace the question mark?



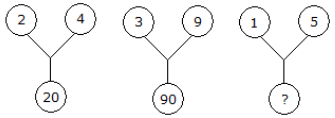
17) Which one will replace the question mark?



18) Which one will replace the question mark?

3	15	4
7	38	5
3	?	5

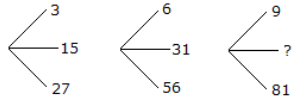
19) Which one will replace the question mark?



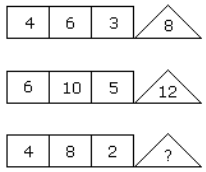
20) Which one will replace the question mark?

7	9	21	27
4	2	36	18
9	4	54	?

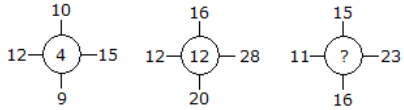
21) Which one will replace the question mark?



22) Which one will replace the question mark?



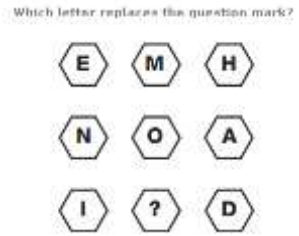
23) Which one will replace the question mark?



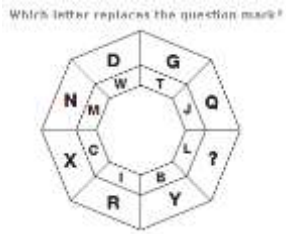
MISSING LETTERS PUZZLES

EXERCISES

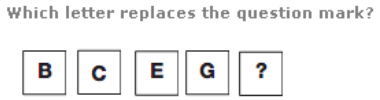
1)



2)



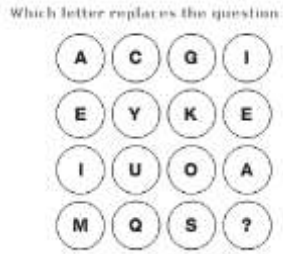
3)



4)

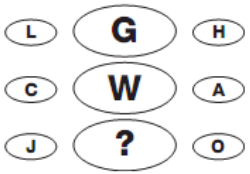
5)

6)



7)

Which letter replaces the question mark?



8)

Which letter replaces the question mark?

9)

Which letter replaces the question mark?

10)

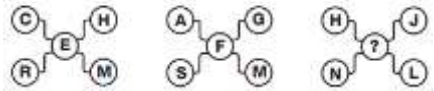
Which letter replaces the question mark?

11)

Which letter replaces the question mark?

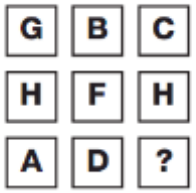
12)

Which letter replaces the question mark?



13)

Which letter replaces the question mark?

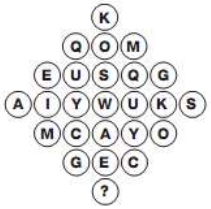


14)

Which letter replaces the question mark?

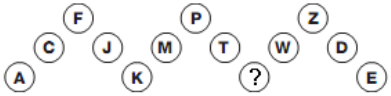
15)

Which letter replaces the question mark?



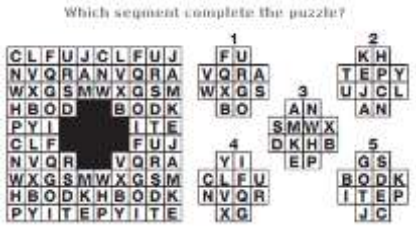
16)

Which letter replaces the question mark?



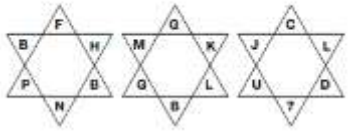
17)

Which segment complete the puzzle?



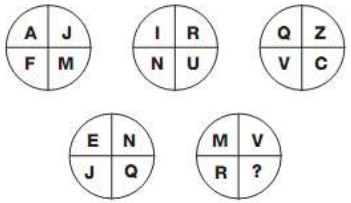
18)

Which letter replaces the question mark?



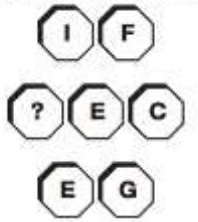
19)

Which letter replaces the question mark?



20)

Which letter replaces the question mark?



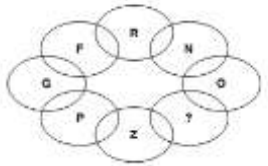
21)

Which letter replaces the question mark?

13	INC	2
6	QRG	7
4	DOM	8
7	SUI	7
8	AD?	2

22)

Which letter replaces the question mark?

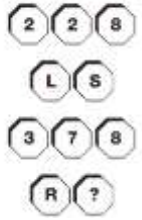


LOGICAL PUZZLES

EXERCISES

1)

Which letter replaces the question mark?



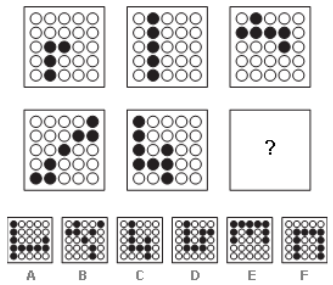
2)

Which number replaces the question mark?

6	EJI	3
M F K		D P G
9	NRG	?

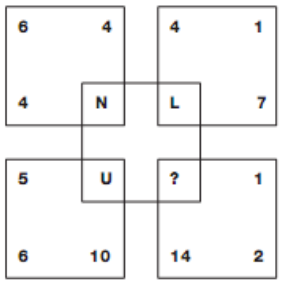
3)

What is missing in the last grid?

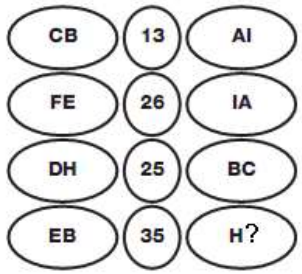


4)

Which letter replaces the question mark?



Which letter replaces the question mark?

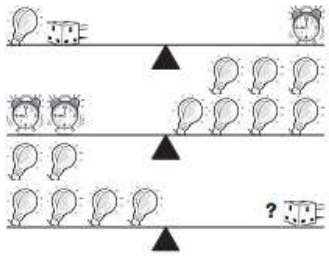


Which letter replaces the question mark?

J	O?J	V
L O S		I W L
X	DKS	B

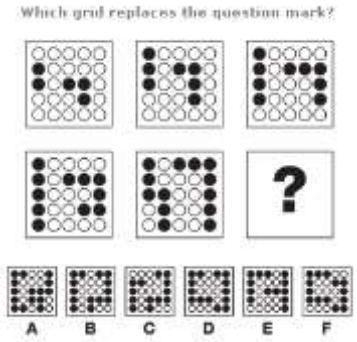
5)

Which symbol replaces the question mark?



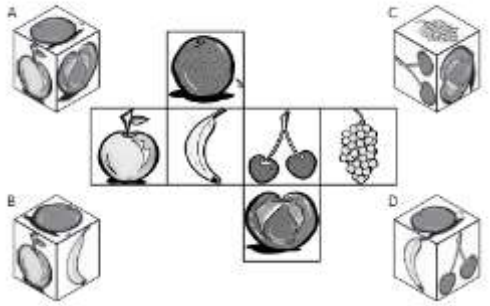
6)

Which grid replaces the question mark?



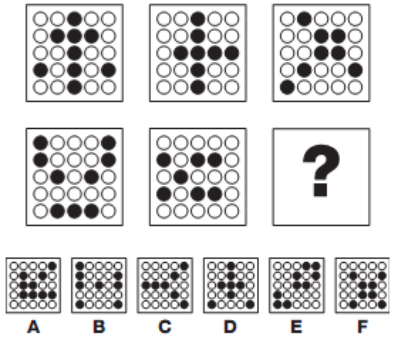
11)

Which picture cube does this shape make?



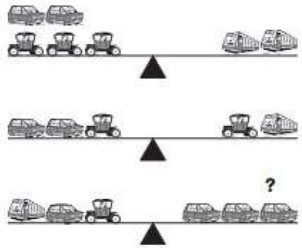
12)

Which grid replace the question mark?



13)

Which object is needed to make scales balance?



7)

Which number replaces the question mark?

6		1
L	P	D
2		4

5		1
J	M	C
2		3

4		4
L	T	H
3		2

3		2
O	U	F
5		?

8)

Which letter replaces the question mark?

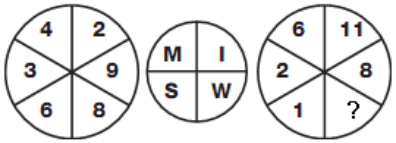
3	P	8
9	G	11
2	U	4
3	W	1
7	?	18

9)

10)

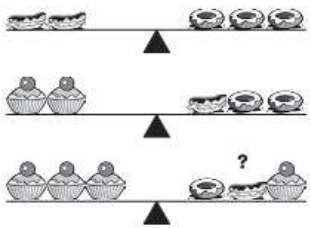
14)

Which number replaces the question mark?



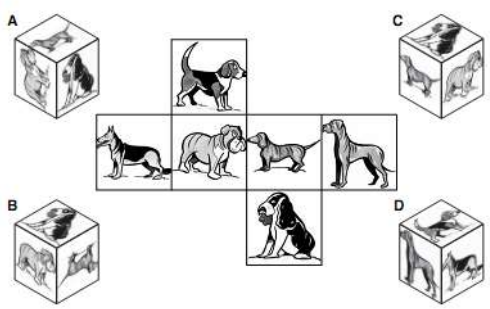
15)

Which symbol is needed to balance the bottom scale?



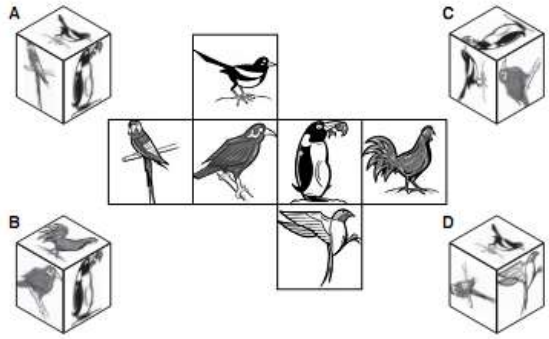
16)

Which picture cube does this shape make?



17)

Which picture cube does this shape make?



18)

19)

Which letter replaces the question mark?

N	252	R
T	500	Y
Y	400	P
K	132	L
G	182	?

20)

Which symbol is needed to balance the bottom scale?

21)

Which letter replaces the question mark?

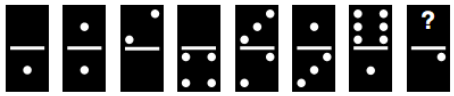
E		B
9	3	6
A		H

D		A
9	4	3
B		C

B		E
9	7	5
C		I

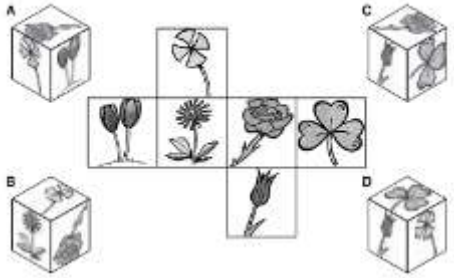
A		G
6	1	2
C		?

Which number replaces the question mark?



22)

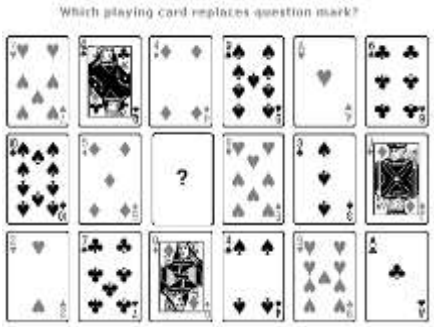
Which picture cube does this shape make?



PLAYING CARDS PUZZLES

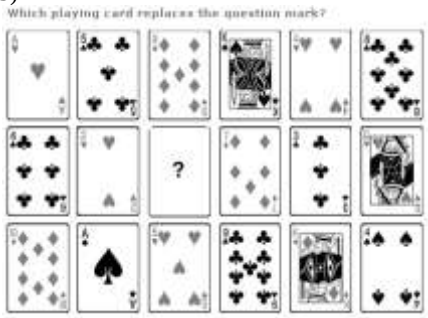
EXERCISES

1)

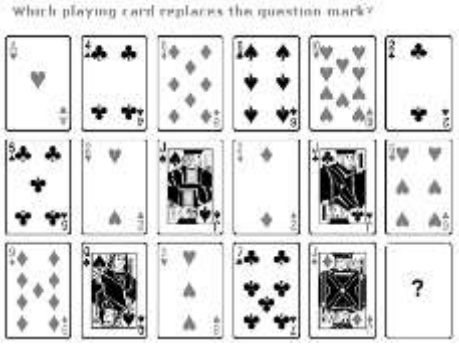


2)

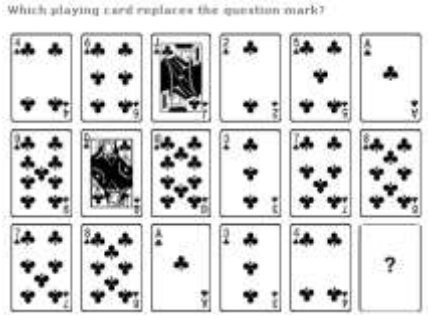
3)



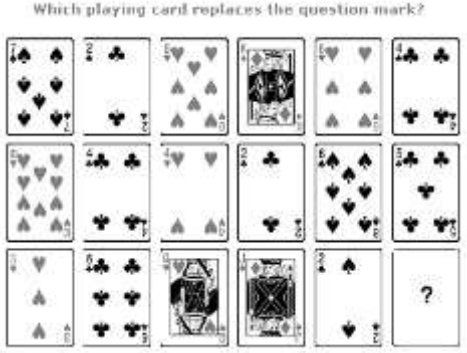
4)



5)



6)



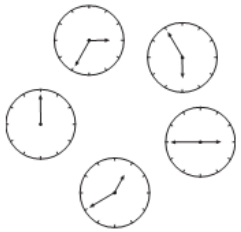
CLOCK PUZZLES

EXERCISES

1)

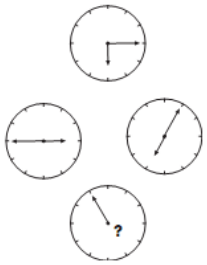
2)

Where should the missing hour hand point?



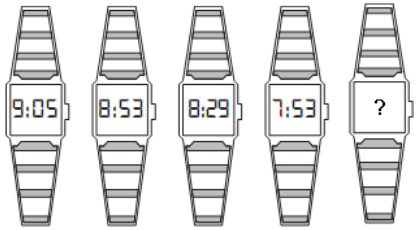
3)

Where should the hour hand be pointing on the bottom clock?



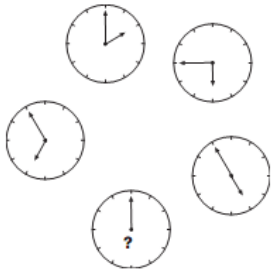
5)

What time should the last watch show?



7)

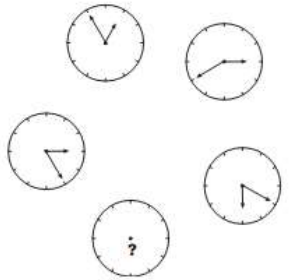
Where should missing hour hand point?



Which time should the last watch show?

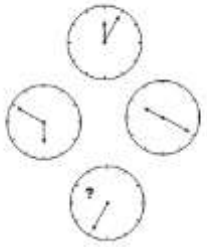
4)

What time should the bottom clock show?



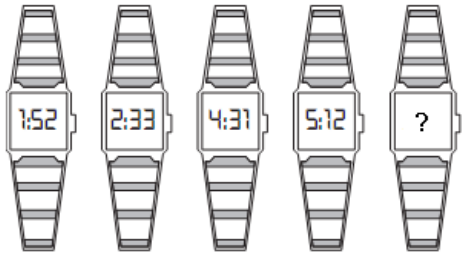
6)

Where should the hour hand point to on the bottom clock?



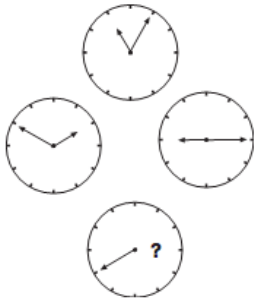
8)

What time should the last watch show?



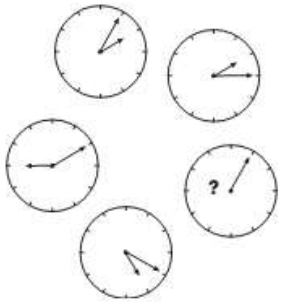
9)

Where should the hour hand point to on the bottom clock?

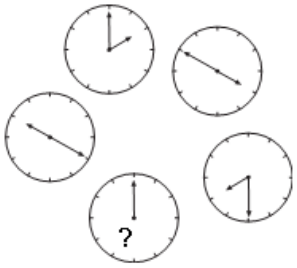


10)

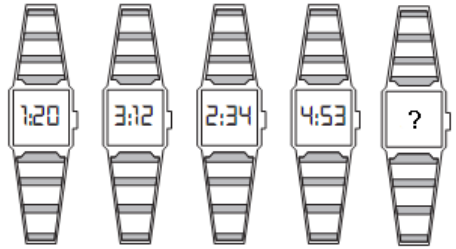
Where should the missing hour hand point to?



What time should the missing hand point to on the bottom clock?

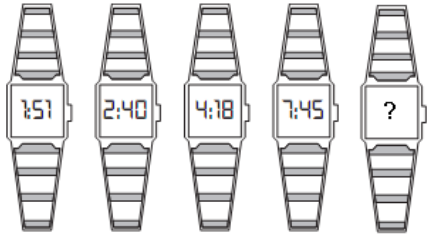


What time should the last watch show?



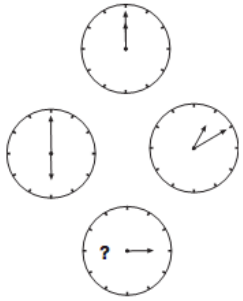
11)

What time should last watch show?



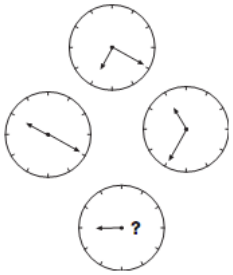
12)

What should the minute hand point to on the bottom clock?



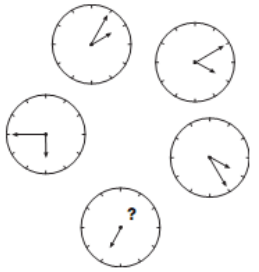
17)

Where should the minute hand point on to the bottom clock?



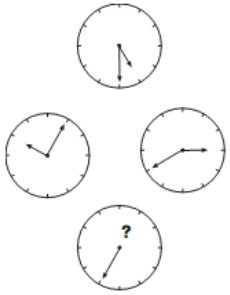
18)

Where should the minute hand point to on the bottom clock?



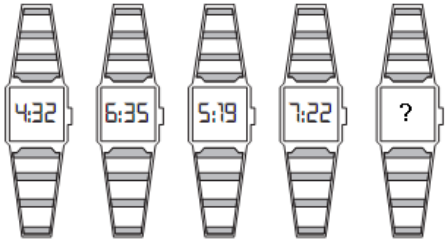
13)

Where should the missing hour hand point to on the bottom clock?



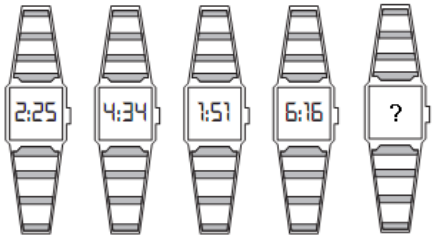
14)

What time should the last watch show?



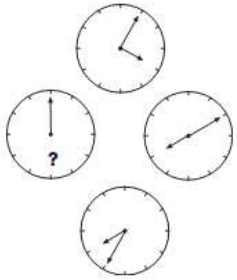
19)

What time should the last watch show?



20)

Where should the missing hand point to?



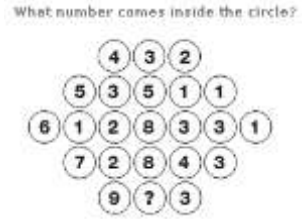
15)

16)

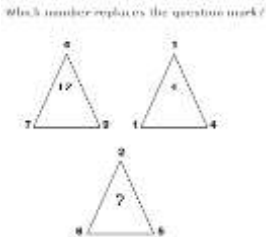
NUMBER PUZZLES

EXERCISES

1)

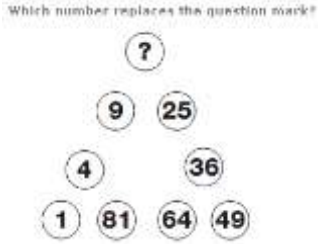


2)

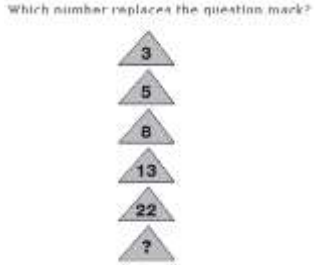


3)

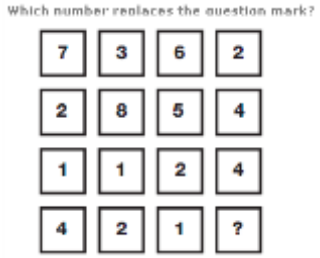
4)



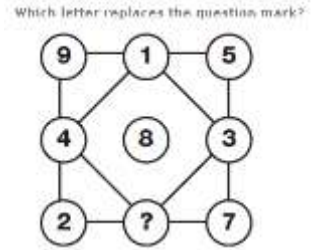
5)



6)



7)

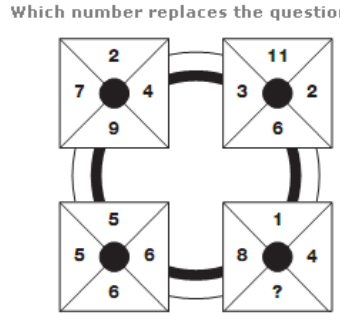


8)

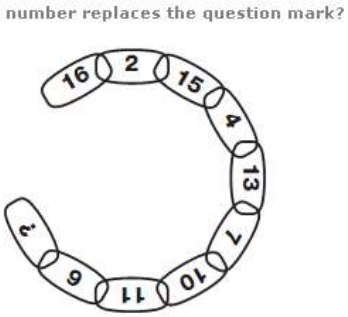
9)

10)

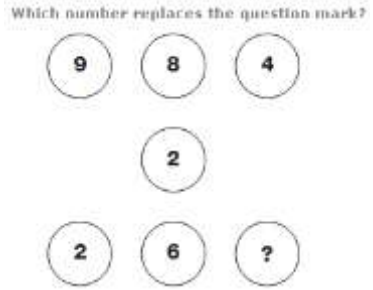
11)



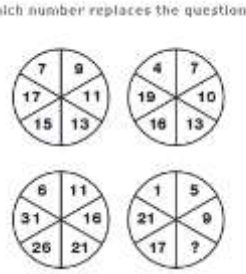
12)



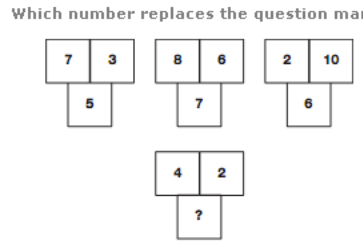
13)



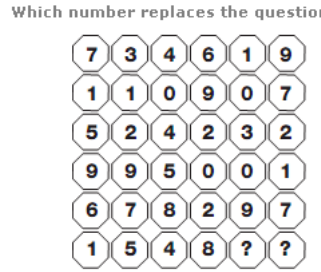
14)

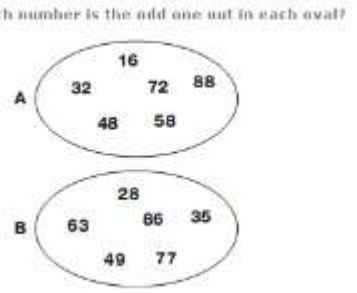


15)

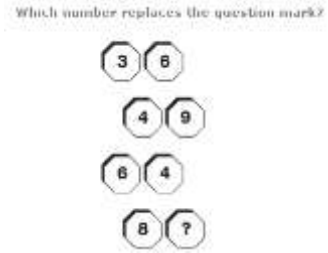


16)

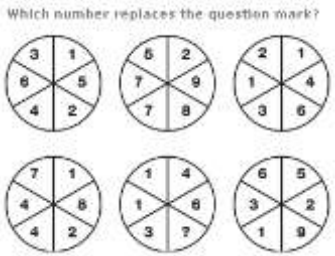




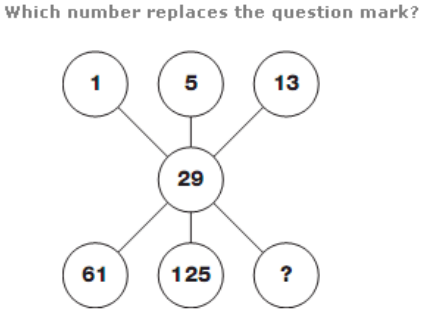
17)



18)

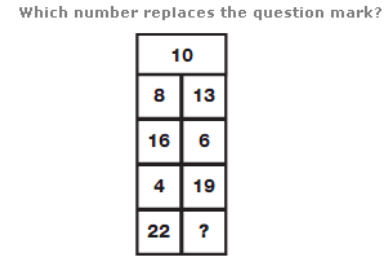


19)

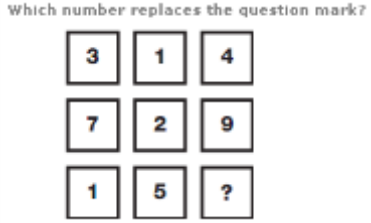


20)

21)



22)



SUDOKU

SUDOKU RULES

The objective of Sudoku is to enter a digit from 1 through 9 in each cell, in such a way that:

Each horizontal row (shown in x) contains each digit exactly once.
Each vertical column (shown in y) contains each digit exactly once.
Each sub grid or region (shown in z) contains each digit exactly once.

					y			
x	x	x	x	x	y	x	x	x
					y			
z	z	z			y			
z	z	z			y			
z	z	z			y			
					y			
					y			
					y			

EXERCISES

1)

6		3	2		8	7		9
		9				4		
	5						6	
		4	3		7	8		
5								1
		2	9		1	5		
	4						3	
		1				6		
7		6	4		5	2		8

2)

			6	4				9
7						6	3	5
		3					8	
			1	3				2
	8		2		4		1	
1				7	5			
	6					4		
9	7	5						1
3				2	9			

3)

2	3					1		4
	7	1	4				3	9
4			3	8			7	
			7		3	4	9	
		3		1		2		
	6	4	9		5			
	4			3	8			6
5	1				7	9	8	
3		2					4	1

4)

2	9		8	3			6	5
6		4					9	
5						8		7
8					3			
7		9				4		
			6		8		2	
	1							
					5	9	8	3
	2	8	9		7			

5)

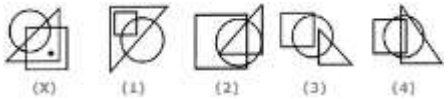
2			7				1	
			5			2		
	3				1		5	
1				9			6	
		3		1		8		
	8			7				4
	6		3				9	
		9			7			
	7				4			8

DOT SITUATION

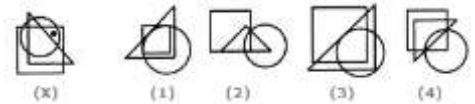
EXERCISES

From amongst the figures marked (1), (2), (3) and (4), select the figure which satisfies the same conditions of placement of the dots as in figure (X). Select the figure which satisfies the same conditions of placement of the dots as in Figure-X.

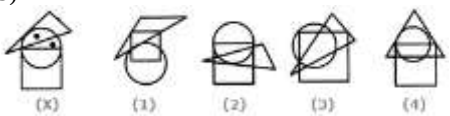
1)



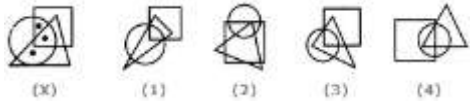
2)



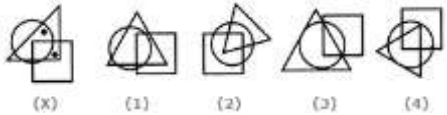
3)



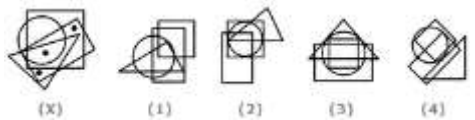
4)



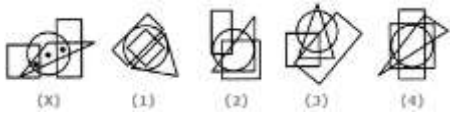
5)



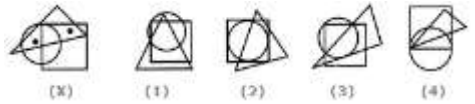
6)



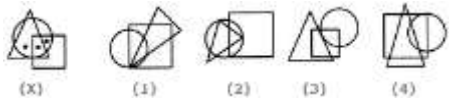
7)



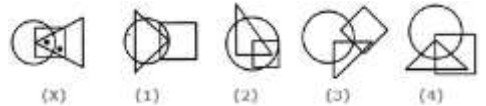
8)



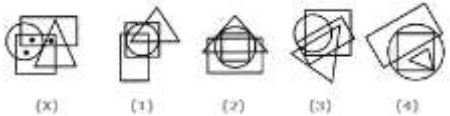
9)



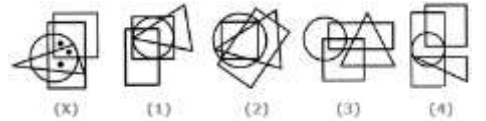
10)



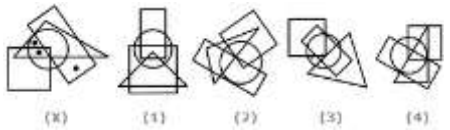
11)



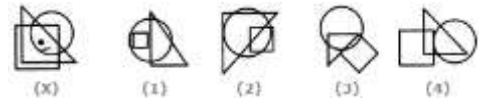
12)



13)

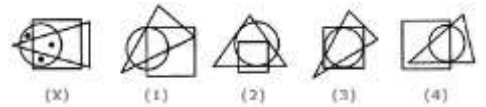


14)

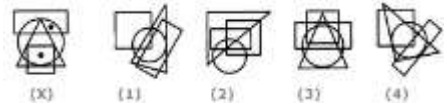


15)

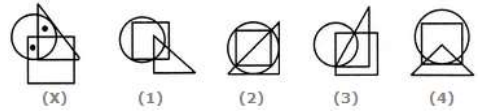
16)



17)

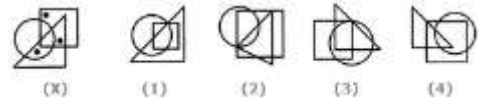


18)



19)

20)

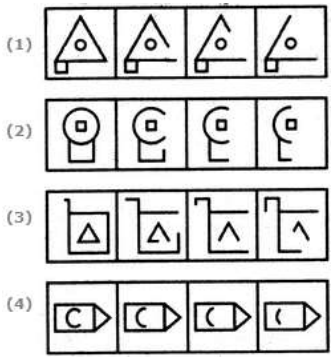


RULE DETECTION

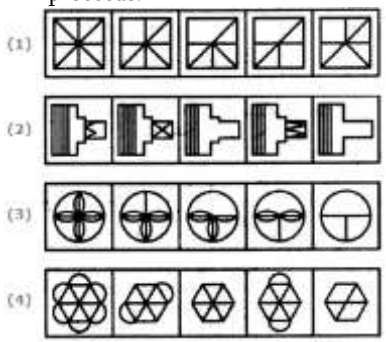
EXERCISES

In each of the following questions, choose the set of figures which follows the given rule.

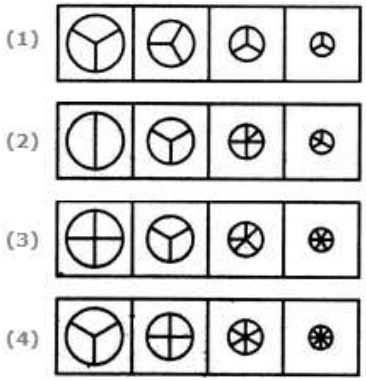
1) **Rule:** Closed figures become more and more open and open figures become more and more closed.



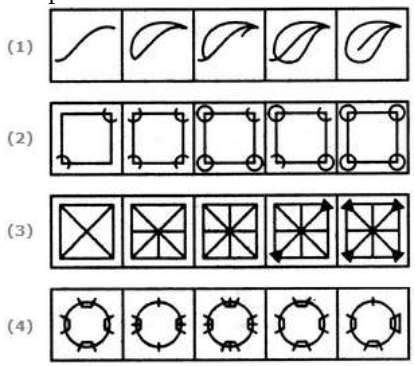
2) **Rule:** The series becomes simpler as it proceeds.



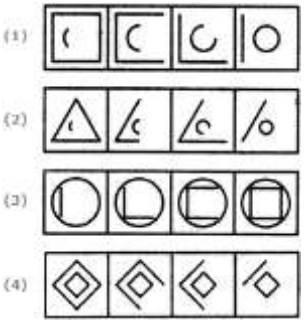
3) **Rule:** As the circle decreases in size, its sectors increase in number.



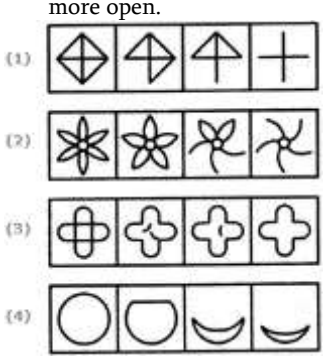
4) **Rule:** The series becomes complex as it proceeds.



5) **Rule:** Closed figures become more and more open and open figures become more and more closed.



6) **Rule:** Closed figure becomes more and more open.

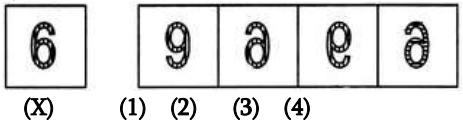


MIRROR AND WATER IMAGES

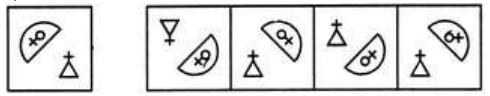
EXERCISES

In each of the following questions, choose the correct mirror images of the given image of the Fig.(X) from amongst the four alternatives (1), (2), (3) and (4) given along with it.

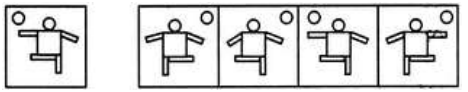
1)



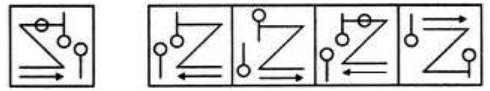
2)



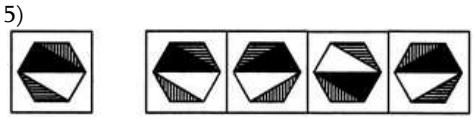
3)



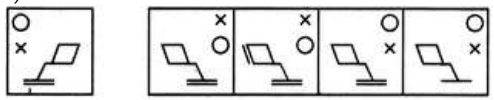
4)



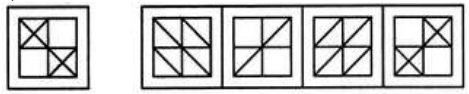
5)



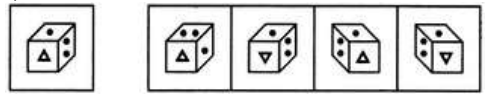
6)



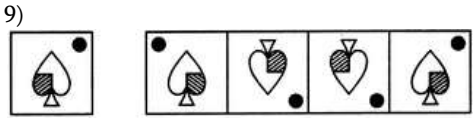
7)



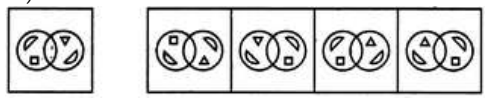
8)



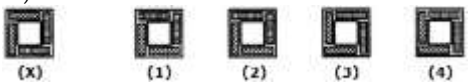
9)



10)



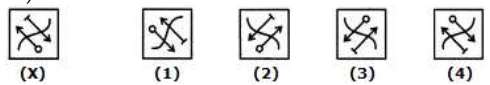
11)



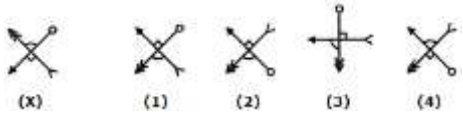
12)

13)

14)

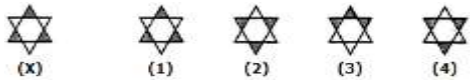


15)

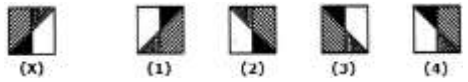


16)

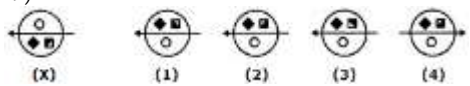
17)



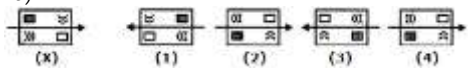
18)



19)



20)

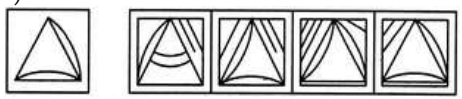


EMBEDDED IMAGES

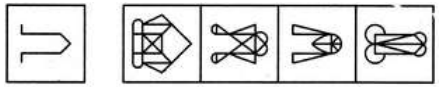
EXERCISES

In each of the following questions, you are given a figure (X) followed by four alternative figures (1), (2), (3) and (4) such that figure (X) is embedded in one of them. Trace out the alternative figure which contains fig. (X) as its part.

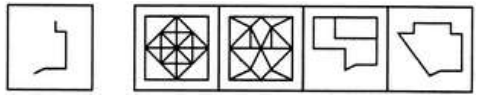
1)



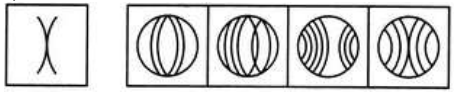
2)



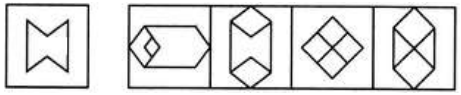
3)



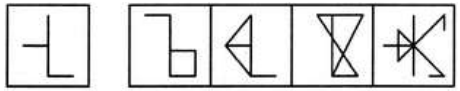
4)



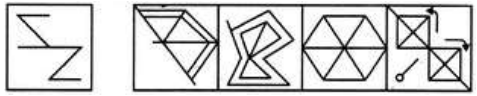
5)



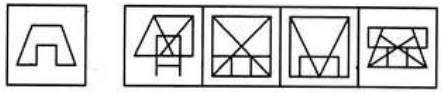
6)



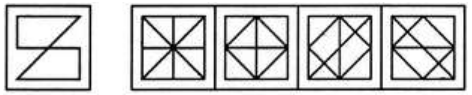
7)



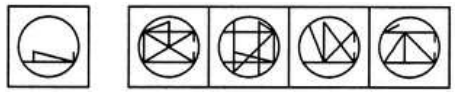
8)



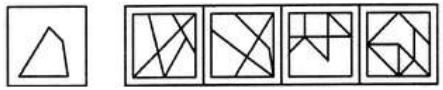
9)



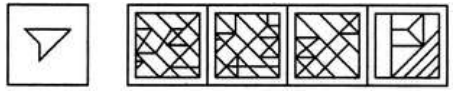
10)



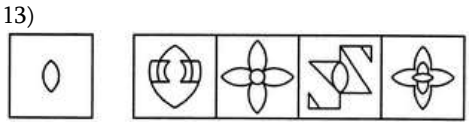
11)



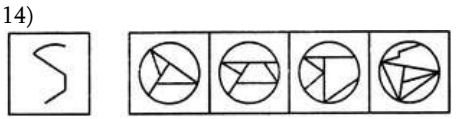
12)



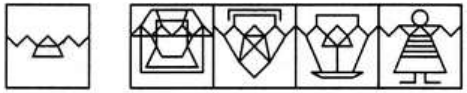
13)



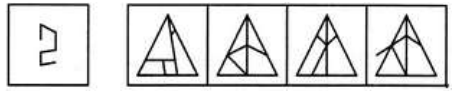
14)



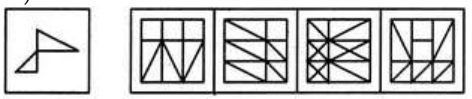
15)



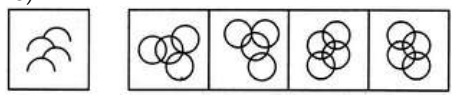
16)



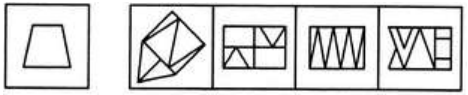
17)



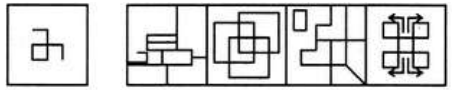
18)



19)



20)

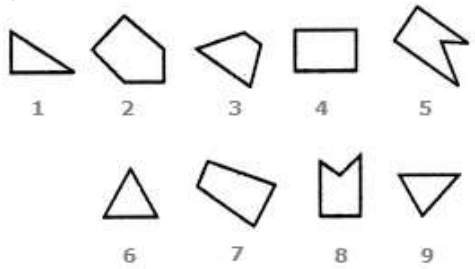


GROUPING OF IMAGES

EXERCISES

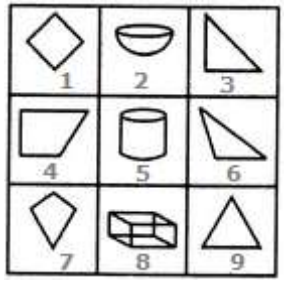
In each of the following questions, group the given figures into three classes using each figure only once.

1)



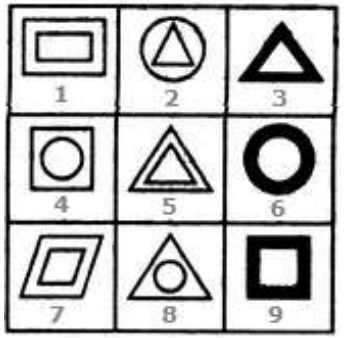
A. 7,8,9 ; 2,4,3 ; 1,5,6
B. 1,3,2 ; 4,5,7 ; 6,8,9
C. 1,6,8 ; 3,4,7 ; 2,5,9
D. 1,6,9 ; 3,4,7 ; 2,5,8

2)



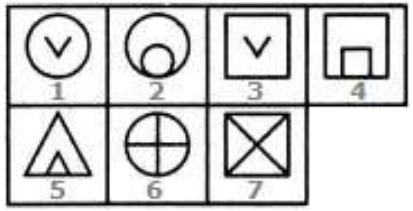
A. 1,4,7 ; 2,5,8 ; 3,6,9
B. 1,4,7 ; 2,5,9 ; 3,6,7
C. 1,3,4 ; 2,5,8 ; 6,7,9
D. 1,2,3 ; 4,5,6 ; 7,8,9

3)



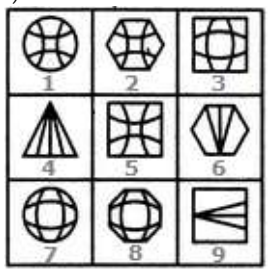
A. 1,5,7 ; 2,4,6 ; 3,9,8
B. 1,5,7 ; 2,4,8 ; 3,6,9
C. 1,4,7 ; 2,5,8 ; 3,6,9
D. 1,7,9 ; 3,5,8 ; 2,4,6

4)



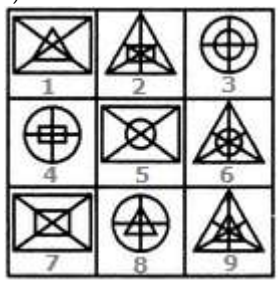
A. 1,2,6 ; 3,4,7 ; 5
B. 1,3 ; 2,6 ; 4,5,7
C. 1,2,6,7 ; 3 ; 4,5
D. 1,3 ; 2,4,5 ; 6,7

5)



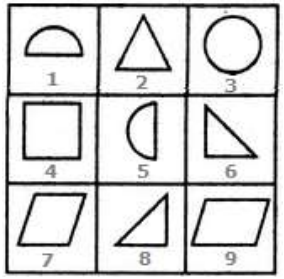
A. 1,2,5 ; 3,7,8 ; 4,6,9
B. 1,7,2 ; 3,9,6 ; 4,5,8
C. 2,3,8 ; 4,6,9 ; 1,5,7

6)



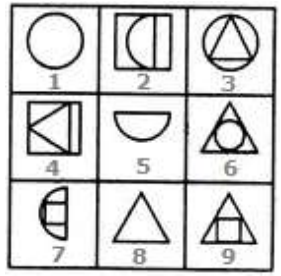
A. 2,4,7 ; 1,8,9 ; 3,5,6
B. 2,6,9 ; 1,5,7 ; 3,4,8
C. 2,6,7 ; 1,5,8 ; 3,4,9
D. 5,6,9 ; 3,4,1 ; 2,7,8

7)



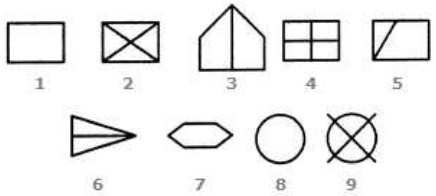
A. 1,3,5 ; 2,6,9 ; 4,7,8
B. 2,3,4 ; 5,6,8 ; 9,1,7
C. 1,3,5 ; 2,6,8 ; 4,7,9
D. 3,2,4 ; 6,5,8 ; 7,9,1

8)



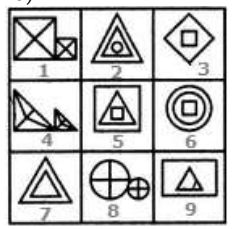
A. 1,5,8 ; 3,4,7 ; 2,6,9
B. 1,3,6 ; 4,5,9 ; 2,7,8
C. 1,3,6 ; 2,5,7 ; 4,8,9
D. 6,7,8 ; 1,3,7 ; 2,4,9

9)



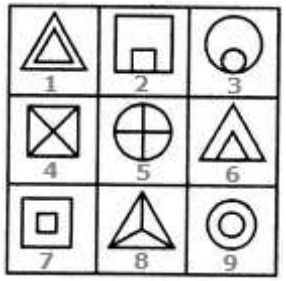
A. 1,2,4 ; 3,5,6 ; 7,8,9
B. 1,7,8 ; 3,5,6 ; 2,4,9
C. 1,3,4 ; 2,8,9 ; 5,6,7
D. 1,7,8 ; 2,3,6 ; 4,5,9

10)



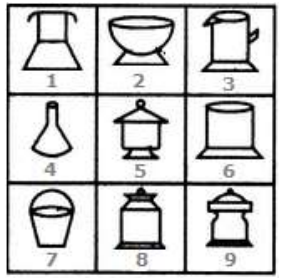
A. 1,3,7 ; 2,4,6 ; 5,8,9
B. 1,4,6 ; 2,5,7 ; 3,8,9
C. 1,4,8 ; 2,5,6 ; 3,7,9
D. 1,4,8 ; 2,7,9 ; 3,5,6

11)



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

12)

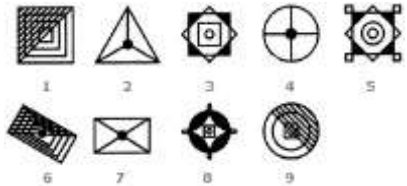


A. 1,4,7 ; 2,5,9 ; 3,8,6
B. 2,6,9 ; 1,4,7 ; 5,8,3
C. 1,4,7 ; 2,3,6 ; 5,8,9
D. 3,5,1 ; 4,7,8 ; 6,2,9

13)

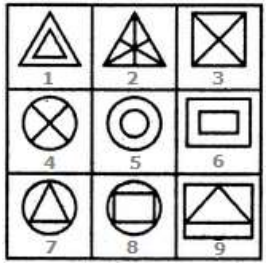
A. 1,5,8 ; 2,6,7 ; 3,4,9
B. 1,5,7 ; 2,6,8 ; 3,4,5
C. 1,5,8 ; 2,4,7 ; 3,6,9
D. 1,5,8 ; 2,6,9 ; 3,4,7

14)



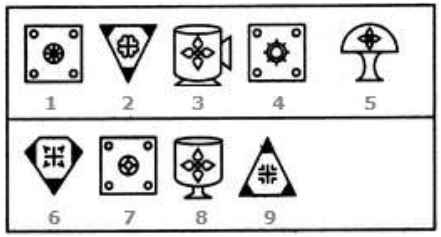
A. 2,4,7 ; 1,6,9 ; 3,5,8
B. 1,3,5 ; 2,6,7 ; 4,8,9
C. 1,5,7 ; 2,3,6 ; 4,8,9
D. 1,3,5 ; 2,4,7 ; 6,8,9

15)



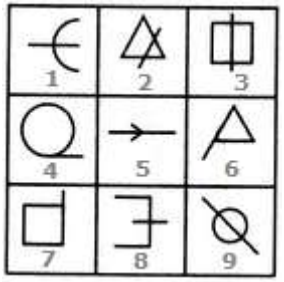
A. 1,2,3 ; 4,5,8 ; 6,7,9
B. 1,5,6 ; 2,3,4 ; 7,8,9
C. 1,3,5 ; 2,4,8 ; 6,7,9
D. 1,4,7 ; 2,5,8 ; 3,6,9

16)



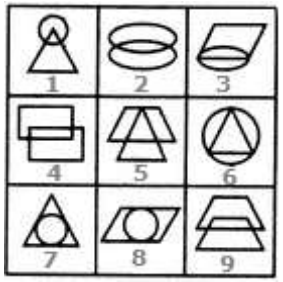
A. 1,4,7 ; 3,6,9 ; 2,5,8
B. 1,6,9 ; 2,4,7 ; 3,5,8
C. 1,4,7 ; 2,6,9 ; 3,5,8
D. 1,5,7 ; 2,6,9 ; 3,4,8

17)



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

18)



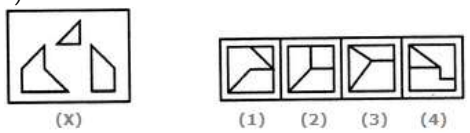
A. 1,5,9 ; 2,7,8 ; 3,4,6
B. 1,5,6 ; 4,7,8 ; 2,3,9
C. 2,4,9 ; 6,7,8 ; 1,3,5
D. 3,7,8 ; 4,5,9 ; 1,2,6

IMAGE ANALYSIS

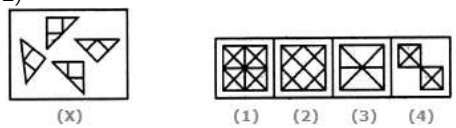
EXERCISES

Find out which of the figures (1), (2), (3) and (4) can be formed from the pieces given in figure (X).

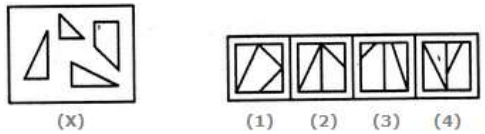
1)



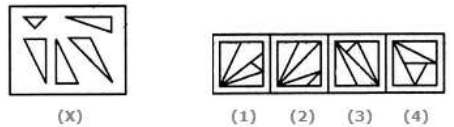
2)



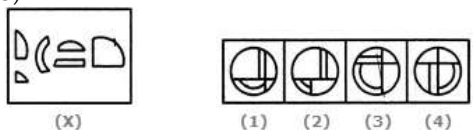
3)



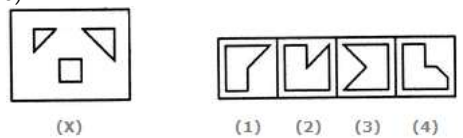
4)



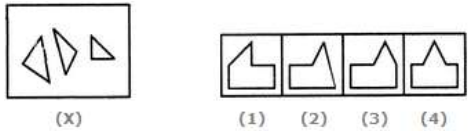
5)



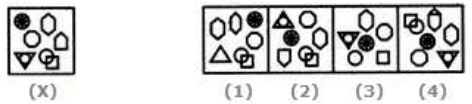
6)



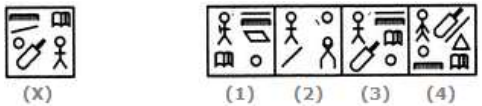
7)



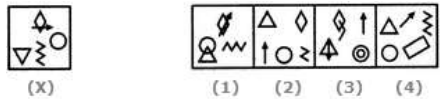
8)



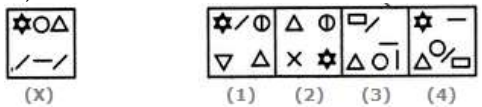
9)



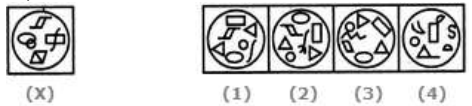
10)



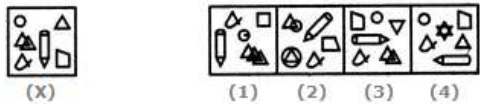
11)



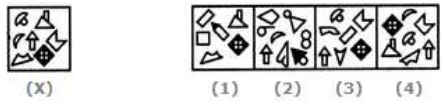
12)



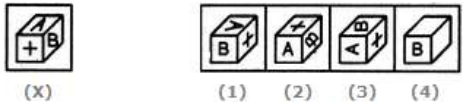
13)



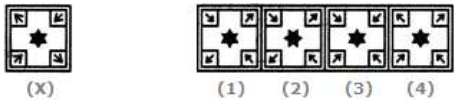
14)



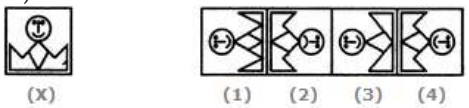
15) Find out how the key figure (X) look will like after rotation.



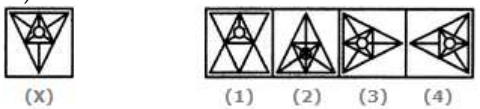
16) Find out how the key figure (X) look will like after rotation.



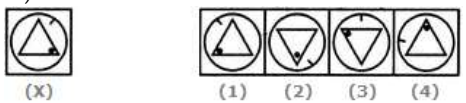
17)



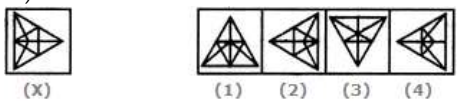
18)



19)



20)



PATTERN COMPLETION

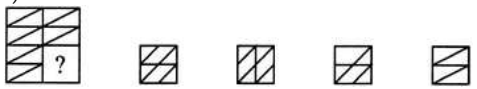
EXERCISES

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.

1)

2)

3)



4)

5)

6)

7)

8)

9)

10)

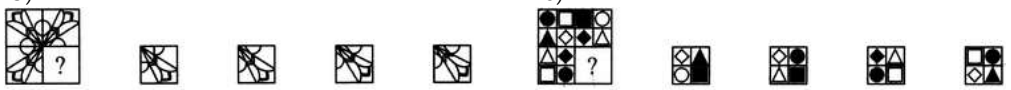
11)

12)

13)

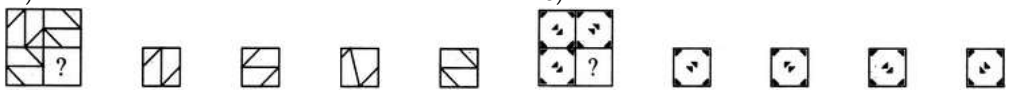
14)

15)



16)

17)



18)

19)

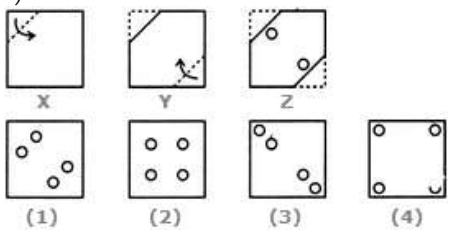
20)

PAPER CUTTING

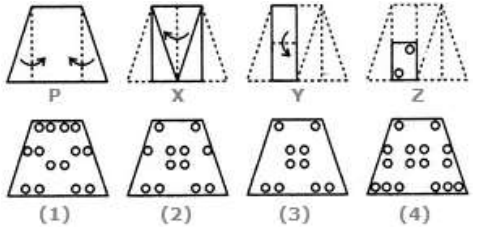
EXERCISES

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).

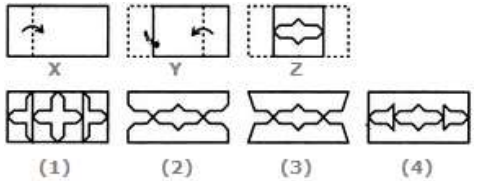
1)



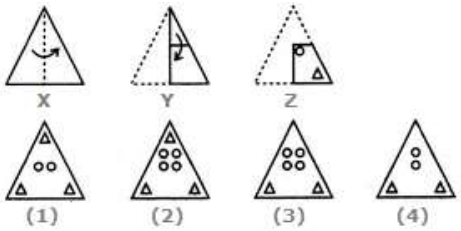
2)



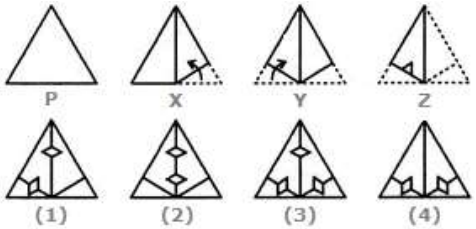
3)



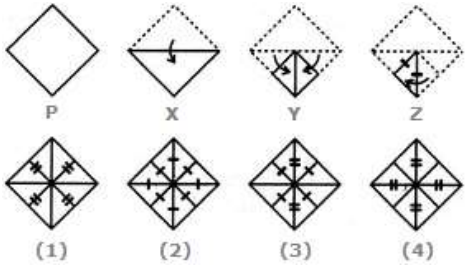
4)



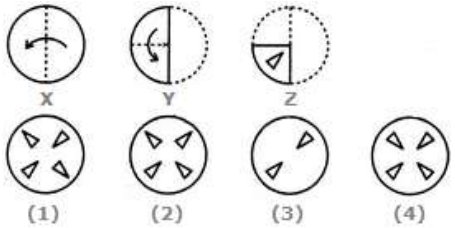
5)



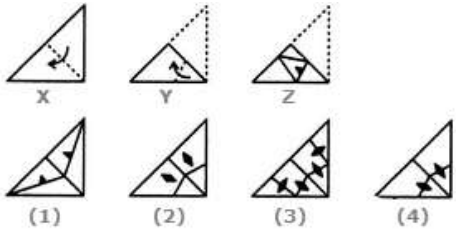
6)



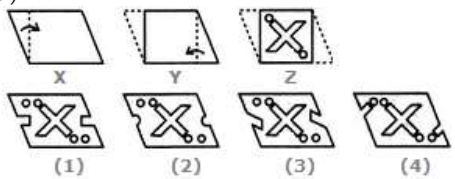
7)



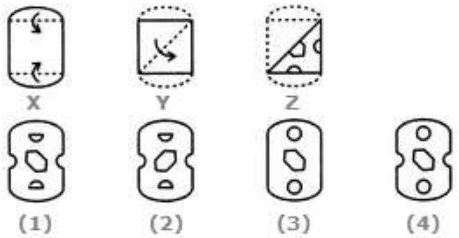
8)



9)

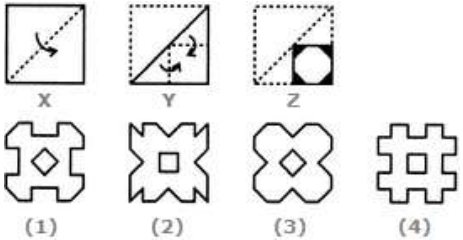


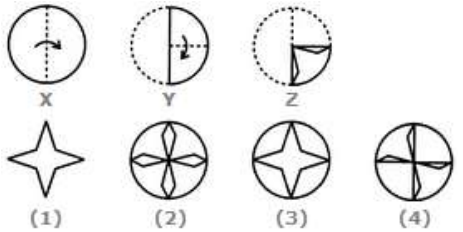
10)



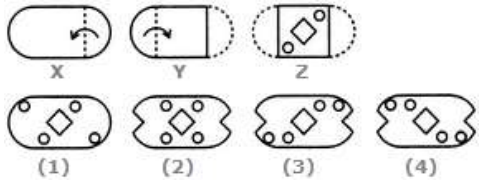
11)

12)

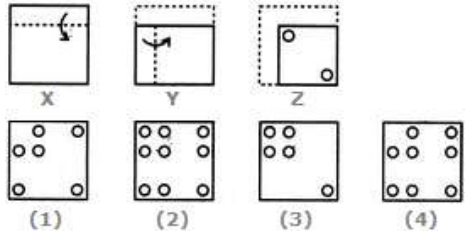




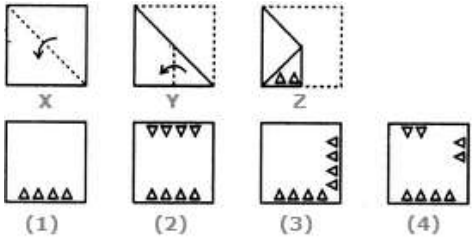
13)



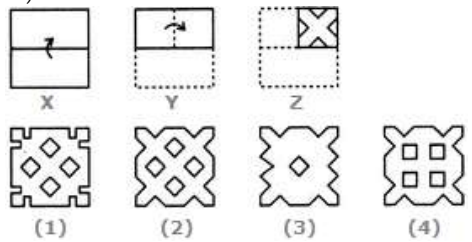
14)



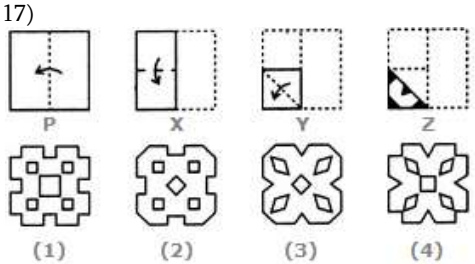
15)



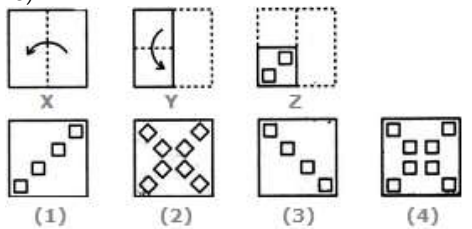
16)



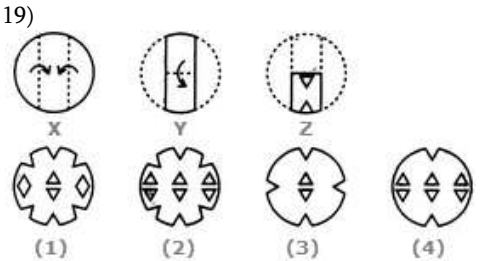
17)



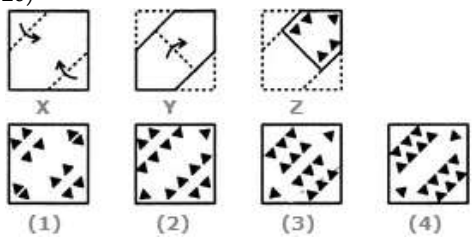
18)



19)



20)

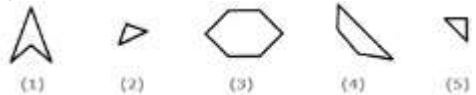


SHAPE CONSTRUCTION

EXERCISES

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)



A. 124 B. 234 C. 345 D. 235

2)

A. 135 B. 123 C. 145 D. 234

3)

A. 123 B. 234 C. 345 D. 245

4)

A. 123 B. 234 C. 134 D. 235

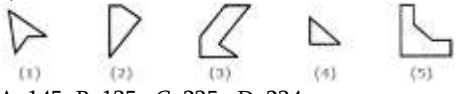
5)

A. 123 B. 134 C. 135 D. 345

6)

A. 145 B. 234 C. 134 D. 235

7)



A. 145 B. 135 C. 235 D. 234

8)

A. 134 B. 124 C. 234 D. 345

9)

A. 123 B. 235 C. 245 D. 145

10)

A. 145 B. 234 C. 245 D. 135

11)

A. 123 B. 125 C. 234 D. 245

12)

A. 124 B. 234 C. 345 D. 235

13)

A. 123 B. 124 C. 125 D. 235

14)

A. 125 B. 123 C. 235 D. 234

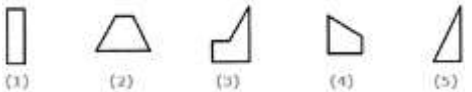
15)

A. 123 B. 134 C. 135 D. 145

16)

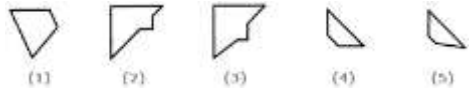
A. 123 B. 234 C. 124 D. 245

17)



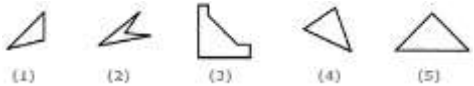
A. 123 B. 134 C. 235 D. 345

18)



A. 123 B. 234 C. 134 D. 345

19)



A. 134 B. 145 C. 125 D. 124

20)

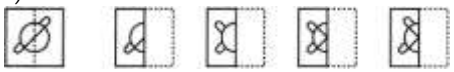
A. 123 B. 124 C. 134 D. 345

PAPER FOLDING

EXERCISES

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 patter would appear when the transparent sheet is folded at the dotted line.

1)



(X) (1) (2) (3) (4)

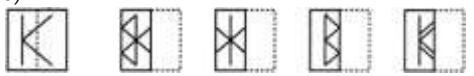
2)

3)

4)

5)

6)



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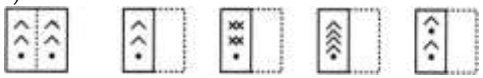

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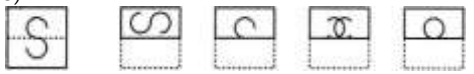
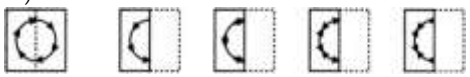


9)

10)

11) 

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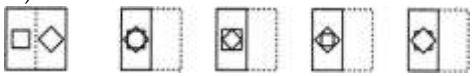
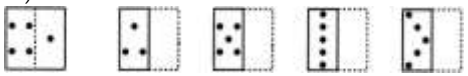
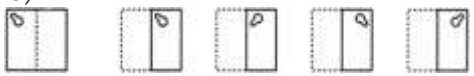
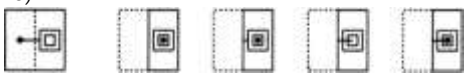
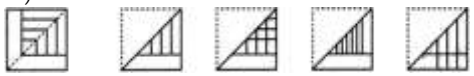
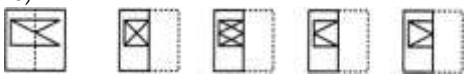
13) 

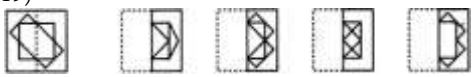
14) 

15) 

16) 

17) 

18) 

19) 

20) 

VERBAL APTITUDE

CLOSET TEST

EXERCISES

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
   2) A.with B.by C.after D.from
   3) A.buy B.take C.pick D.want
   4) A.hardly B.easily C.frequently D.conveniently
   5) A.costs B.returns C.dividend D.prices

2) As a rule of thumb, a manned mission costs from fifty to a hundred times more than a comparable unmanned mission. Thus, for scientific exploration alone, ...(1)... missions, employing machine intelligence, are ...(2)... However, there may well be ...(3)... other than scientific for exploring ...(4)... social, economic, political, cultural or ...(5)...

   1) manned B. unmanned C. space D. lunar
   2) liked B. wanted C. used D. preferred
   3) reasons B. causes C. clues D. objects
   4) moon B. sun C. space D. mission
   5) casual B. historic C. historical D. histrionic

3) The principal advantage in having a clear cut objective of business is that it does not derail; the enterprise does not stray ...(1)... the direct route that it has set for ...(2)... Enterprises with well defined objectives can conveniently undertake ...(3)... and follow long range development policies. Recognition of objectives ...(4)... the temptation to compromise long range ...(5)... for short term gains and improves coordination in work and consistency in policy.

   1) from B. on C. along D. towards
   2) others B. industry C. itself D. government
   3) production B. research C. audit D. appraisal
   4) invites B. defers C. shifts D. removes
   5) A. objectives B. loses C. interests D. profits

4) Each species has its special place or habitat. An ...(1)... bird-watcher can look at ...(2)... forest, meadow, lake, swamp or field and ...(3)... almost exactly what birds he ...(4)... find there ...(5)... birds are found all over the world; others ...(6)... themselves to certain areas. Still ...(7)... migrate from one country to another in ...(8)... in search of warmth and ...(9)... and then return in spring, ...(10)... the season is more favourable.

   1) A. expert B. experienced C. advanced D. active
   2) A. the B. some C. a D. certain
   3) A. predict B. suggest C. prophecy D. calculate
   4) A. should B. must C. might D. will
   5) A. more B. some C. most D. all
   6) A. keep B. entrust C. confine D. involve
   7) A. some B. others C. few D. all
   8) A. winter B. summer C. spring D. autumn
   9) A. seeds B. crops C. fruit D. food
   10) A. while B. until C. after D. when

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 B. Penicillin C. Streptomycin D. Teramycin E. Medicine
2) A. within B. through C. on D. into E. over
3) A. treating B. operating C. discovering D. spreading E. monitoring
4) A. In B. Over C. While D. After E. During
5) A. children B. injured C. patients D. doctors E. nurses
6) A. study B. prevent C. dismiss D. spread E. remove
7) A. treatment B. patient C. cause D. discovery E. operation
8) A. were B. may be C. have D. are E. would be
9) A. multiplying B. providing C. saving D. infecting E. growing
10) A. children B. species C. women D. medicos E. people

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) dampen B. hinder C. indulge D. arouse E. prohibit
2) A. expelled B. ceased C. abstained D. refrained E. inferred
3) A. invariably B. hopefully C. deliberately D. purposely E. negatively
4) A. wanting B. associating C. engaging D. supporting E. exhibiting
5) A. manageable B. valuable C. unattainable D. reachable E. approachable
6) A. hostile B. necessary C. incidental D. insensible E. detrimental
7) A. express B. appreciate C. reciprocate D. damage E. negate
8) A. realised B. hypothesised C. verbalised D. criticised E. actualized
9) A. projected B. determined C. controlled D. galvanised E. pronounced
10) A. downgrades B. fabricates C. develops D. sees E. enlarges

IDIOMS & PHRASES

EXERCISES

Some proverbs/idioms are given below together with their meanings. Choose the correct meaning of proverb/idiom,

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

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

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

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

5) To do oneself justice
A.To dispense justice on our won
B.To treat others with due respect
C.To defends one's point of view
D.To follow the path of truth and justice
E.None of these

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

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

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

9) To be the question
A.To refer to
B.To take for granted
C.To raise objections
D.To be discussed

10) A black sheep
A.An unlucky person
B.A negro
C.An ugly person
D.A partner who takes no share of the

E.None of these

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

12) To smell a rat
A.To see signs of plague epidemic
B.To get bad small of a bad dead rat
C.To suspect foul dealings
D.To be in a bad mood
E.None of these

13) To hit the right nail 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

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 into argument over any issue
E.None of these

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

In the following questions four alternatives are given for the idiom/phrase *italicized 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

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

3) He *went back* on his promise to vote for me.
A. withdrew
B. forgot
C. reinforced
D. supported

4) The old beggar *ran amuck* and began to throw stones at the passerby.
A. became desperate
B. ran about wildly
C. become annoyed
D. felt disgusted

5) I cannot *conceive* of a time when I was without a refrigerator
A. Imagine
B. Give birth
C. Understand
D. Depend

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

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

8) The detective *left no stone unturned* to trace the culprit.
A. took no pains
B. did very irrelevant things
C. resorted to illegitimate practices
D. used all available means

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

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

11) The parliamentary inquiry into the Bofors deal did not *bring to light* any startling facts.
A. Prove
B. Probe
C. Highlight
D. Disclose

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

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

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

15) The dacoit murdered the man *in cold blood*.
A. coldly
B. boldly

16) He has built a big business empire by his *sharp practices*.
A. extreme hard work
B. keen business skills

C. ruthlessly
D. deliberately

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

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

C. dishonest dealings
D. sharp intelligence

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.

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

SYNONYMS

EXERCISES

1) AUGUST
A.Common B.Ridiculous
C.Dignified D.Petty

2) KEN
A. Ignorance B. Witness
C. Trial D. Knowledge

3) VENT
A.Opening B.Stodge
C.End D.Past tense of go

4) EMBEZZLE
A.Misappropriate
B.Balance
C.Remunerate
D.Clear

5) RABBLE
A. Mob B. Noise
C. Roar D. Rubbish

6) MAYHEM
A. Jubilation B. Havoc
C. Excitement D. Defeat

7) CORPULENT
A.Lean
B.Gaunt
C.Emaciated
D.Obese

8) ZANY
A. Clown B. Pet
C. Thief D. Magician

9) MELD
A. To soothe B. Merge
C. Purchase D. Glisten

10) FRUGALITY
A. Foolishness
B. Extremity
C. Enthusiasm

11) CANTANKEROUS
A. Quarrelsome B. Rash
C. Disrespectful D. Noisy

12) SCINTILLATING
A. Smouldering
B. Glittering
C. Touching
D. Economy

13) TEPID
A. Hot B. Warm
C. Cold D. Boiling

14) IMPROMPTU
A. Offhand
B. Unimportant
C. Unreal D. Effective

15) INTIMIDATE
A. To hint B. Frighten
C. Bluff D. Harass

16) COMBAT
A. Conflict B. Quarrel
C. Feud D. Fight

17) MAYHEM
A. Jubilation B. Havoc
C. Excitement D. Defeat

18) CONNOISSEUR
A. Ignorant
B. Lover of art
C. Interpreter
D. Delinquent

19) REPERCUSSION
A. Clever reply
B. Recollection
C. Remuneration
D. Reaction

20) WARY
A. Sad B. vigilant
C. Distorted D. Tired

21) RABBLE
A. Mob B. Noise
C. Roar D. Rubbish

22) PONDER
A. Think B. Evaluate
C. Anticipate D. Increase

23) LAUD
A. Lord B. Eulogy
C. Praise D. Extolled

24) LYNCH
A. Hang B. Madden
C. Kill D. Shoot

25) DESTITUTION
A. Humility B. Moderation
C. Poverty D. Beggary

26) DEIFY
A. Flatter B. Challenge
C. Worship D. Face

27) HARBINGER
A. Massenger B. Steward
C. Forerunner D. Pilot

28) TACITURNITY
A. Dumbness
B. Changeablemess
C. Hesitation
D. Reserve

29) RANT
A. Praise inordinately
B. Formalise
C. To preach noisly
D. Treat with screen

30) REFECTORY
A. Restaurant
B. Parlour
C.Living Room
D. DiningRoom

ANTONYMS

EXERCISES

1) HAPHAZARD
A. Fortuitous
B. Indifferent
C. Deliberate
D. Accidental

2) IMPASSE
A.Resurgence
B.Breakthrough
C.Continuatio
D.Combination

3) FLAGITIOUS
A. Innocent B. Vapid
C. Ignorant D. Frivolous

4) STARTLED
A. Amused B. Relaxed
C. Endless D. Astonished

5) NIGGARDLY
A. Frugal B. Thrifty
C. Stingy D. Generous

6) LOQUACIOUS
A. Reticent B. Talkative
C. Garrulous D. Verbose

7) CULPABLE
A. Defendable
B. Blameless
C. Careless
D. Irresponsible

8) QUIESCENT
A. ACTIVE
B. Dormant
C. Weak
D. Unconcerned

9) MORTAL
A. Divine B. Immortal
C. Spiritual D. Eternal

10) ZENITH
A. Acme B. Top
C. Nadir D. Pinnacle

11) RELINQUISH
A. Abdicate B. Renounce
C. Posses D. Deny

12) EXODUS
A. Influx
B. Home-coming
C. Return D. Restoration

13) PERENNIAL
A. Frequent B. Regular
C. Lasting D. Rare

14) BENIGN
A. Malevolent B. Soft
C. Friendly D. Unwise

15) EXTRICATE
A. Manifest B. Palpable
C. Release D. Entangle

16) EVASIVE
A. Free B. Honest
C. Liberal D. Frank

17) GREGARIOUS
A. Antisocial B. Glorious
C. Horrendous
D. Similar

18) REPRESS
A. Inhibit B. Liberate
C. Curb D. Quell

19) HIRSUTE
A. Scaly B. Bald
C. Erudite D. Quiet

20) ACQUITTED
A. Freed B. Burdened
C. Convicted
D. Entrusted

21) INSIPID
A. Tasty B. Stupid
C. Discreet D. Feast

22) FRUGAL
A. Copious
B. Extravagant
C. Generous
D. Ostentatious

23) TANGIBLE
A. Ethereal B. Concrete
C. Actual D. Solid

24) INDISCREET
A. Reliable B. Honest
C. Prudent D. Stupid

25) EQUANIMITY
A. Resentment
B. Dubiousness
C. Duplicity
D. Excitement

26) FLIMSY
A. Frail B. Filthy
C. Firm D. Flippant

27) HAPLESS
A. Cheerful B. Consistent
C. Fortunate D. Shapely

28) HOSTILITY
A. Courtesy B. Hospitality
C.RelationshipD. Friendliness

29) VANITY
A. Pride B. Humility
C. Conceit D. Ostentious

30) HYPOCRITICAL
A. Gentle B. Sincere
C. Amiable D. Dependable

CHANGE OF VOICE

EXERCISES

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.

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.

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.

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.

5) Do you imitate others?
A. Are others being imitated by you?
B. Are others imitated by you?
C. Have others being imitated by you?
D. Were others being imitated by you?

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.

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.

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?

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

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.

child.
C. This mischief could not have been done by a child.
D. This mischief a child could not have been done.

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.

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.

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.

C. These kittens can be played with you quite safely.
D. These kittens can be played with quite safely.

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.
C. I remember myself being taken to the museum by my sister.
D. I remember taken to the museum by my sister.

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.

CHANGE OF SPEECH

EXERCISES

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.

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."

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.

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"

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 rose 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.

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."

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.

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.

9) She exclaimed with sorrow that was a very miserable plight.
A. She said with sorrow, "What a pity it is."

10) She said that she would finish the work the next day.
A. She said, "I will finish the work the next

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."

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.

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."

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."

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.

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."

LETTER AND SYMBOL SERIES

EXERCISES

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

2) ZA5, Y4B, XC6, W3D, _____
A. E7V B. V2E C. VE5 D. VE7

3) QAR, RAS, SAT, TAU, _____
A. UAV B. UAT C. TAS D. TAT

4) P5QR, P4QS, P3QT, _____, P1QV
A. PQW B. PQV2 C. P2QU D. PQ3U

5) BCB, DED, FGF, HIH, ___
A. JKJ B. HJH C. IJI D. JHJ

6) JAK, KBL, LCM, MDN, _____
A. OEP B. NEO C. MEN D. PFQ

7) QPO, NML, KJI, _____, EDC
A. HGF B. CAB C. JKL D. GHI

8) CMM, EOO, GQQ, _____, KUU
A.GRR B.GSS C.ISS D.ITT

9) ELFA, GLHA, ILJA, _____, MLNA
A.OLPA B.KLMA C.LLMA
D.KLLA

10) FAG, GAF, HAI, IAH, ____
A.JAK B.HAL C.HAK D.JAI

11) B_2CD, _____, BCD_4, B_5CD, BC_6D
A.B_2C_2D B.BC_3D C.B_2C_3D D.BCD_7

ESSENTIAL PART

DIRECTIONS TO SOLVE

A good way to approach this type of question is to use the following sentence: "A _____ could not exist without _____.".

EXERCISES

1) orchestra
A. violin B. stage C. musician D. soloist

2) provisions
A. groceries B. supplies C. gear D. caterers

3) infirmary
A. surgery B. disease C. patient D. receptionist

4) sustenance
A. nourishment B. water C. grains D. menu

5) purchase
A. trade B. money C. bank D. acquisition

6) dimension
A. compass B. ruler C. inch D. measure

7) bonus
A. reward B. raise C. cash D. employer

8) Culture
A. civility B. education C. agriculture D. customs

9) knowledge
A. school B. teacher C. textbook D. learning

10) harvest
A. autumn B. stockpile C. tractor D. crop

11) desert
A. cactus B. arid C. oasis D. flat

12) book
A. fiction B. pages C. pictures D. learning

13) language
A. tongue B. slang C. writing D. words

14) School
A. student B. report card C. test D. learning

15) gala
A. celebration B. tuxedo C. appetizer D. orator

16) monopoly
A. corrupt B. exclusive C. rich D. gigantic

17) pain
A. cut B. burn C. nuisance D. hurt

18) election
A. president B. voter C. November D. nation

19) shoe
A. sole B. leather C. laces D. walking

20) swimming
A. pool B. bathing suit C. water D. life jacket

SPELLINGS

EXERCISES

Find the correctly spelt words

1) A.Indipensable B. Indipenseble
C.Indispansible D. Indispensable

2) A.Itinarery B. Itinerary
C. Itenary D. Itinarary

3) A.Survaillance B. Surveillance
C. Survellance D. Surveilance

4) A.Sepulchral B. Sepilchrle
C. Sepalchrul D. Sepalchrl

5) A.Judicious B. Cancious
C. Dilicous D. Gracous

6) A.Klaptomania B. Klepptomania
C. Kleptemania D. Kleptomania

7) A.Eflorescence B. Efllorescence
C. Effloresence D. Efflorascence

8) A.Exterminatte B. Inexpliccable
C. Offspring D. Reffere

9) A.Entrepreneur B. Entrapreneur
C. Entrepraneur D. Enterprenuer

10) A.Equanimity B. Equannimity
C. Equanimmity D. Equinimity

11) A. Treachrous B. Trecherous
C. Trechearous D. Treacherous

12) A. Rigerous B. Rigourous
C. Regerous D. Rigorous

13) A. Palete B. Palet
C. Palate D. Pelate

14) A. Bouquete B. Bouquette
C. Bouquet D. Boqquet

15) A. Chancelary B. Chancellery
C. Chancelery D. Chancellary

Find out that word, the spelling of which is WRONG.

1) A. Immature B. Imminent
C. Ilicit D. Imperative E. All correct

2) A. Quarreled B. Rebellious
C. Commission D. Mirraculous
E. All correct

3) A. Lenient B. Nationalism
C. Overhaul D. Transfered E. All correct

4) A, Refuse B. Repute
C. Despute D. Confuse E. All correct

5) A. Urge B. Merge
C. Perge D. Surge E. All correct

6) A, Aristocracy B. Prophecy
C. Beaureacuracy D. Democracy
E. All correct

7) A. Narrator B. Overseer
C. Pretence D. Licence E. All correct

8) A. Burglar B. Designation
C. Controversy D. Ratificasion
E. All correct

9) A. Periphery B. Advurtise
C. Courteous D. Indefinite E. All correct

10) A. Psychologist B. Psychaitrist
C. Physiologist D. Psychoanalyst
E. All correct

11) A. Geography B. History
C. Chemistry D. Commerce
E. All correct

14) A. Inflamable B. Musician
C. Righteousness D. Negotiate
E. All correct

12) A. Amature B. Manual
C. Nephew D. Athletic E. All correct

15) A. Passion B. Fashion
C. Ration D. Tution E. All correct

13) A. Appraise B. Commend
C.Mentanence D.Behavior E. All correct

In each sentence below, four words which are lettered (A), (B), (C) and (D) have been printed, one which may be either inappropriate in the context of the sentence or wrongly spelt. The letter of that word is answer.

1) A. When none of the advocates
B. accepted
C. his offer
D. he appologised them
E. All correct

2) A. Social security
B. and poverty alleviation
C. programmes are not implimented
D. with required seriousness
E. All correct

3) A. Many legends
B.superstitions endow the moon with a beauty and

4) A. One should be able for
B. differentiate between what is
C. desirable and

C. mistery which will
D. linger for countless years
E. All correct

5) A. The notorious
B. bandit
C. poisoned the guard and made a
D. miraculous escape
E. All correct

D. what is not
E. All correct

6) A. The non-availability
B. of unprocessed natural
C. resources in a country should not be the
D. basic for rejecting that possibility of export industry
E. All correct

SELECTING WORDS

EXERCISES

Pick out the most effective word(s) from the given words to fill in the blank to make the sentence meaningfully complete.

1) Success in this examination depends ..... hard work alone.
A. at B. over C. for D. on

2) My uncle decided to take ..... and my sister to the market.
A. I B. mine C. me D. myself

3) We had a ..... of warm weather in February.
A. time B. spell
B. length D. phase

4) The ruling party will have to put its own house ..... order.
A. in B. on C. to D. into

5) Piyush behaves strangely at times and, therefore, nobody gets ..... with him.
A. about B. through C. along D. up

6) Rohan and Rohit are twin brothers, but they do not look .....
A. unique B. different C. likely D. alike

7) To err is ..... to forgive divine.
A. beastly B. human C. inhuman D. natural

7) Man does not live by ..... alone.
A. food B. bread C. meals D. diet

8) ..... of old paintings is a job for experts.
A. Resurrection B. Retrieval C. Restoration D. Resumption

9) Physically we are now all neighbors, but psychologically. we are ..... to each other.
A. primitives B. complimentary
C. strangers D. cowards

8) If you smuggle goods into the country, they may be ..... by the customs authority.
A. possessed B. punished C. confiscated D. fined

10) When their examinations are over, the children gleefully ..... the books they had been reading.
A. shelve B. sidetrack
B. overthrew D. abandon

11) The more your action and thought are allied and ..... the happier you grow.
A. diverget B. unravelled
B. integrated D. invincible

12) In a large cities people are cut ..... from nature.
A. away B. off
C. out D. down

13) If I take a state roadways bus, I'll get late, ... ?
A. isn't it B. won't I
C. will I D. is it

16) He is a person of sound character and ..... disposition.
A. beneficent B. morous
C. amiable D. amicable

17) A stone that goes on rolling ..... no moss.
A. collects B. gets
C. gathers D. accumulates

18) Walking at 3'o clock, I heard the ..... of thunder.
A. crackle B. rumble
C. ripple D. clank

19) The thief ..... all the money.
A. made up B. made off with
C. mode do with D. made good

20) When their examinations are over, the children gleefully ..... the books they had been reading.
A. shelve B. sidetrack
C. overthrew D. abandon

SPOTTING ERRORS

EXERCISES

Read each sentence to find out whether there is any grammatical error in it.

1) If I had known
B. this yesterday
C. I will have helped him.
D. No error.

2) 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.

3) A. One of the members
B. expressed doubt if
C. the Minister was an athiest.
D. No error.

4) A. I have got
B. my M.Sc. degree
C. in 1988.
D. No error.

5) A. Having received your letter
B. this morning, we are writing
C. to thank you for the same.
D. No error.

6) A. If you lend him a book
B. he will lend it to some one else
C. and never you will get it back.
D. No error.

7) A. Block of Residential flats

8) A. Do the roses in your garden smell

B. are coming up
C. near our house.
D. No error

9) A. According to the Bible
B. it is meek and humble
C. who shall inherit the earth.
D. No error.

10) A. None of the students attending your class
B. answered your questions
C. did they?
D. No error.

11) A. He is working in
B. a bank in New Delhi
C. for the past several months.
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.

13) A. The person which was
B. recommended for the position
C. did not fulfil the prescribed qualifications.
D. No error.

14) A. Supposing if
B. there is no bus.
C. how will you get there?
D. No error.

15) A. One of my favourite actor
B. is acting
C. in this play also.
D. No error.

16) A. Emphasis on equality of life ensures
B. for the health and happiness
C. of every individual.
D. No error.

17) A. Because of the emergency help
B. that the patient received
C. he would have died
D. No error.

18) A. He was in such hurry
B. that he didn't
C. wait for me
D. No error.

19) A. Few scientists changed
B. people's ideas as much as
C. Darwin with his Theory of Evolution.
D. No error.

20) A. The course provide
B. not only theoretical inputs
C. but also practical training
D. No error.

ORDERING OF WORDS

EXERCISES

In each question below, there is a sentence of which some parts have been jumbled up. Rearrange these parts which are labeled 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

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

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 B. RQPS
C. RSPQ D. PSRQ

4) He knows 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 B. SQRP
C. SPRQ D. QSRP

5) He told us that P : and enjoy 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 B. QRPS
C. RQSP D. RQPS

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 B. PSQR
C. PRSQ D. QRSP

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 B. QRSP
C. RSPQ D. QPSR

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 B. QRSP
C. QRPS D. RPSQ

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:

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

A. PQSR B. QRSP
C. PRSQ D. QPRS

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 B. QSRP
C. QSPR D. PQRS

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 B. SPQR
C. PRSQ D. QPRS

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 B. PRSQ
C. RSQP D. PRQS

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
The Proper sequence should be:
A. QRSP B. RQPS
C. RSPQ D. QSRP

15) Little P : that he had been let down
Q : stood by all these years
R : did he realize
S : by a colleague whom he had
The Proper sequence should be:
A. RPSQ B. RSQP
C. QSRP D. QSPR

16) It is very easy
P : a great deal more than one realizes
Q : may mean
R : that a phrase that one does not quite understand
S : to persuade oneself
The Proper sequence should be:
A. RSQP B. SPQR
C. SRQP 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 B. RPQS
C. SRPQ 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 B. QSRP
C. QRPS D. RPQS

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 B. SPRQ
C. SQRP D. RSQP

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 B. RSPQ
C. QPSR D. RQPS

SENTENCE CORRECTION

EXERCISES

Which of phrases given below should replace the phrase printed in bold type?

1) He is too important **for tolerating** any delay.
A. to tolerate B. to tolerating
C. at tolerating D. with tolerating
E. No correction required

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

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

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

5) **Shapes** of gods and goddess are worshipped by people.
A. Images
B. Reflections
C. Clay shapes
D. Clay toys
E. No correction required

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

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

8) **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

9) The world has seen **small** real attempt at population and resource planning.
A. few

10) We don't know **how did the thief made** an escape.
A. how the thief did make

B. little
C. less
D. a few
E. No correction required

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

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

B. how the thief does make
C. how the thief made
D. how was the thief made
E. No correction required

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

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

SENTENCE IMPROVEMENT

EXERCISES

In questions given below, a part of the sentence is italicised and underlined. Below are given alternatives to the italicized part which may improve the sentence. Choose the correct alternative.

1) Will you kindly *open* the knot?
A. untie B. break
C. loose D. No improvement

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

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

4) More than one person *was killed* in accident.
A. were killed B. are killed
C. have been killed D. No improvement

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

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

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

8) I hope you won't object *to me watching* while you work.
A. against me watching B. me to watch
C. to my watching D. No improvement

9) You cannot forbid *him leaving*.
A. he leaving B. his leaving
C. him to leave D. No improvement

10) You have come here with a view *to insult me*.
A. to insulting me B. of insulting me
C. for insulting me D. No improvement

11) 20 kms *are not a great distance* in these days of fast moving vehicles.
A. is not a great distance B. is no distance
C. aren't a great distance D. No improvement

12) It became clear that the strangers were heading *into* a serious disaster.
A. along B. towards
C. for D. No improvement

13) The dissidents *hold* a great problem in every political party.
A. cause B. give
C. pose D. No improvement

14) I would have waited for you at the station if *I knew* that you would come.
A. had known B. was knowing
C. have known D. No improvement

15) Practically *every part* of the banana tree is used by man.
A. each part B. any part
C. most part D. No improvement

16) My *opinion for* the film is that it will bag the national ward.
A. opinion to B. opinion about
C. opinion on D. No improvement

COMPLETING STATEMENTS

EXERCISES

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

2) Although initial investigations pointed towards him .....
A. the preceding events corroborated his involvement in the crime
B. the additional information confirmed his guilt

E. exhibit generous and magnanimous gestures

3) The weather outside was extremely pleasant and hence we decided to .....
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

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
C. Anand fixed a deal with Mahesh in 2 days
D. Anand's friendship with Mahesh lasted for 2 years
E. Anand became a friend of Mahesh in less than 2 days

7) The manager would like you to help Dhiraj, means .....
A. the manager would like you if you help Dhiraj
B. the manager desires you to help Dhiraj
C. the manager likes you because you help Dhiraj
D. Dhiraj expects the manager to tell you to help him
E. it will be a help to the manager if you like Dhiraj

9) He has no money now .....
A. although he was very poor once
C. the subsequent events established that he was guilt
D. the subsequent events proved that he was innocent
E. he gave an open confession of his crime

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

6) "It is an uphill task but you will have to do it" means .....
A. The work is above the hill and you will have to do it
B. It is a very easy task but you must do it
C. It is very difficult task but you have to do it
D. This work is not reserved for you but you will have to do it
E. It is almost impossible for others but you can do it

8) Owing to the acute power shortage, the people of our locality have decided to .....
A. dispense with other non-conventional energy sources
B. resort to abundant use of electricity for illumination
C. off-switch the electrical appliance while not in use
D. explore other avenues for utilising the excess power
E. resort to use of electricity only when it is inevitable

10) He is so lazy that he .....
A. cannot depend on others for getting his
B. as he has given up all his wealth
C. because he was very rich once
D. because he has received huge donation
E. because he was very greedy about wealth

11) Dinesh is as stupid as he is lazy means .....
A. Dinesh is stupid because he is lazy
B. Dinesh is lazy because he is stupid
C. Dinesh is either stupid or lazy
D. Dinesh is hardly stupid but he is lazy
E. Dinesh is equally stupid and lazy

13) Because he believes in democratic principles, he always .....
A. decides all the matters himself
B. listen to others views and enforces his own
C. shown respect to others opinions if they match his own
D. reconciles with the majority views and gives us his own
E. imposes his own views on others

15) He always stammers in public meetings, but his today's speech .....
A. was fairly audible to everyone present in the hall
B. was not received satisfactorily
C. could not be understood properly
D. was not liked by the audience
E. was free from that defect

work done
B. cannot delay the schedule of completing the work
C. can seldom complete his work on time
D. dislike to postpone the work that he undertakes to do
E. always help others to complete their work

12) Practically, very little work could be completed in the last week as it was .....
A. full of working days
B. a very hectic week
C. full of holidays
D. a very busy week
E. loaded with work

14) The employer appeared to be in such an affable mood that Rohit .....
A. decided to ask for a raise in his salary
B. was scared to talk to him about his leave
C. felt very guilty for his inadvertent slip
D. promised him that he would not commit mistake again
E. was pained to press his demand for a new flat.

16) Even though it is very large house, ...
A. there is a lot of space available in it for children
B. there is hardly any space available for children
C. there is no dearth of space for children
D. the servants take a long time to clean it
E. the municipal taxes on it are very happy

SENTENCE FORMATION

EXERCISES

In each question below a sentence broken into five or six parts. Join these parts to make a meaningful sentence. The correct order of parts is the answer.

1. at 2. it 3. take 4. once 5. away
A. 23514 B. 14352 C. 32514 D. 53214 E. 42315

1. him 2. the 3. to 4. charge 5. handover
A. 42531 B. 51342 C. 41352 D. 45231 E. 52431

1. seen 2. going 3. you 4. him 5. have

1. killed 2. a 3. Jaswant 4. bear 5. wild

1. I 2. help 3. not 4. you 5. did

1. tea 2. have 3. that 4. some 5. before

1. bag 2. you 3. seen 4. have 5. my

1. not 2. Hari 3. away 4. run 5. did

1. not 2. hotel 3. comfortable 4. was 5. the

1. was 2. and 3. Suresh 4. kind 5. loving

PARAGRAPH FORMATION

EXERCISES

I. In each question rearrange the given sentences in proper sequence to form a meaningful paragraph; then, mark the correct sequence as answer.

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 B.1243 C.4132 D.3214 E.1324

1. 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.

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.

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.

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.

1. 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.

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.

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

EXERCISES

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 B. SPQR C. QPRS D. RSPQ

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 B. QSPR C. PQRS D. PQSR

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 B. RQPS C. SPQR D. PQSR

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. SRQPB. QSPR C. SQRP D. QPSR

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 B. QPRS C. RSQP D. SPQR

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

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

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

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

10) S1: While crossing a 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 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. PSRQ B. PQRS C. RQSP D. QRPS

11) S1: Calcutta unlike other cities kepts 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. SQRPD. RPSQ

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

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

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

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

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

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

2) The object underlying the rules of natural justice "is to prevent miscarriage of justice" ans 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 jurisdication 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 visualized

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

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 concretisation
C. demand for natural justice and its realisation
D. intention and execution

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

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

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 unprecedentely 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 s 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

2) **Should human sciences be developed because they will**
A. provide more knowledge of the physical word
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

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

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

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

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 exploits 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

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

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

4) **According to the passage, prosperity in industry depends upon**
A. productivity B. inventiveness
C. marketing ability D. official patronage

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

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

2) **Physical courage is an expression of**
A. emotions B. deliberation C. uncertainty D. defiance

3) **A man with moral courage can**
A. defy his enemies B. overcome all difficulties

C. face a situation boldly D. be very pragmatic

4) **People with physical courage of ten lack**
A. mental balance B. capacity for reasoning
C. emotional stability D. will to fight

5) **All virtues become meaningful because of**
A. faith B. charity C. courage D. hope

ONE WORD SUBSTITUTES

EXERCISES

In questions given below out of four alternatives, choose the one which can be substituted for the given word/sentence.

1) State in which the few govern the many
A. Monarchy B. Oligarchy
C. Plutocracy D. Autocracy

2) A style in which a writer makes a display of his knowledge
A. Pedantic B. Verbose
C. Pompous D. Ornate

3) List of the business or subjects to be considered at a meeting
A. Schedule B. Timetable
C. Agenda D. Plan

4) Leave or remove from a place considered dangerous
A. Evade B. Evacuate
C. Avoid D. Exterminate

5) A person pretending to be somebody he is not
A. Magician B. Rogue
C. Liar D. Imposter

6) A person who knows many foreign languages
A. Linguist B. Grammarian
C. Polyglot D. Bilingual

7) One who has little faith in human sincerity and goodness
A. Egoist B. Fatalist
C. Stoic D. Cynic

8) One who possesses many talents
A. Versatile B. Nubile
C. Exceptional D. Gifted

9) Words inscribed on tomb
A. Epitome B. Epistle
C. Epilogue D. Epitaph

10) One who eats everything
A. Omnivorous B. Omniscent
C. Irrestible D. Insolvent

11) The custom or practice of having more than one husband at same time
A. Polygyny B. Polyphony
C. Polyandry D. Polychromy

12) Tending to move away from the centre or axis
A. Centrifugal B. Centripetal
C. Axiomatic D. Awry

13) A person interested in collecting, studying and selling of old things
A. Antiquarian B. Junk-dealer
C. Crank D. Archealogist

14) A drawing on transparent paper
A. Red print B. Blue print
C. Negative D. Transparency

15) One who is not easily pleased by anything
A. Maiden B. Mediaeval
C. Precarious D. Fastidious

16) A remedy for all diseases
A. Stoic B. Marvel
C. Panacea D. Recompense

17) One who is fond of fighting
A. Bellicose B. Aggressive
C. Belligerent D. Militant

18) In a state of tension or anxiety or suspense
A. Off balance B. Depressed
C. Diffused D. On tenterhooks

19) That which cannot be read
A. Negligible B. Illegible
C. Ineligible D. Incorrigible

20) A small shop that sells fashionable clothes, cosmetics, etc.
A. Store B. Stall C. Boutique D. Booth

21) Be the embodiment or perfect example of
A. Characterise B. Idol
C. Personify D. Signify

22) Habitually silent or talking little
A. Serville B. Unequivocal
C. Taciturn D. Synoptic

23) One who cannot be corrected
A. Incurable B. Incorrigible
C. Hardened D. Invulnerable

24) A paper written by hand
A. Handicraft B. Manuscript
C. Handiwork D. Thesis

25) A person not sure of the existence of god
A. Cynic B. Agnostic C. Atheist D. Theist

26) To slap with a flat object
A. Chop B. Hew C. Gnaw D. Swat

VERBAL ANALOGIES

INTRODUCTION

Analogy means similarity. In this type of questions, two objects related in some way are given and third object is also given with four or five alternatives. You have to find out which one of the alternatives bears the same relation with the third objects as first and second objects are related.

Example 1:

Curd : Milk :: Shoe : ?

(A) Leather (B) Cloth (C) Jute (D) Silver

Answer: Option A. As curd is made from milk similarly shoe is made from leather.

EXERCISES

Each question consist of two words which have a certain relationship to each other followed by

four pairs of related words, Select the pair which has the same relationship.

1) WAN:COLOUR
A.corpulent:weight B.insipid:flavour
C.pallid:complexion D.enigmatic:puzzle

2) PORK:PIG
A.rooster:chicken B.mutton:sheep
C.steer:beef D.lobster:crustacean

3) AFTER:BEFORE
A.first:second B.present:past
C.contemporary:historic
D.successor:predecessor

4) INDIGENT:WEALTHY
A.angry:rich B.native:affluent
C.gauche:graceful
D.scholarly:erudite

5) DISTANCE:MILE
A.liquid:litre B.bushel:corn
C.weight:scale D.fame:television

6) GRAVITY:PULL
A. iron:metal B. north pole:directions
C. magnetism:attraction D. dust:desert

7) ARMY:LOGISTICS
A. business:strategy B. soldier:students
C. war:logic D. team:individual

8) LAWYER:COURT
A. businessman:market B. chemist:laboratory
C. labourer:factory D. athlete:Olympics

9) MUNDANE:SPIRITUAL
A.common:ghostly B.worldly:unworldly
C. routine:novel D. secular:clerical

10) TEN:DECIMAL
A. seven:septet B. four:quartet
C. two:binary D. five:quince

11) FILTER:WATER
A. curtail:activity B. expunge:book
C. edit:text D. censor:play

12) HOPE:ASPIRES
A. love:elevates B. film:flam
C. fib:lie D. fake:ordinary

13) CORPOREAL:SPIRITUAL
A. mesa:plateau B. moron:savant
C.foreigner:immigrant
D.pedagogue:teacher

14) SYMPHONY:COMPOSER
A. Leonardo:music B. Fresco:painter
C.colours:pallet D. art:appreciation

15) Glove : Hand
A. Neck : Collar B. Tie : Shirt
C. Socks : Feet D. Coat : Pocket

16) Lawyer : Court
A. Chemist : Laboratory
B. Businessman : Office
C. Labour : Factory
D. Athlete : Olympics

17) Lively : Dull
A. Employed : Jobless B. Flower : Bud
C. Factory : Labour D. Happy : Gay

18) Letter : Word
A. Page : Book B. Product : Factory
C. Club : People
D. Home work : School

19) Scales : Fish
A. Bear : Fur B. Woman : Dress
C. Skin : Man D. Tree : Leaves

20) Candle : Wick
A. Hammer : Nail B. Light : Bulb
C. Oven : Fire D. Bicycle : Wheel

In each of the following questions find out the alternative which will replace the question mark.

1) Shade : Tree :: Warmth : ?
A. Self respect B. Mother
C. Wealth D. Ease

2) Master : OCUVGT :: LABOUR : ?
A. NCDQWT B. NDERWT
C. NBERWT D. NEDRWT

3) Safe : Secure :: Protect : ?
A. Lock B. Sure
C. Guard D. Conserve

4) Conference : Chairman :: Newspaper : ?
A. Reporter B. Distributor
C. Printer D. Editor

5) Eye : Myopia :: Teeth : ?
A. Pyrrhoea B. Cataract
C. Trachoma D. Eczema

6) Architect : Building :: Sculptor : ?
A. Museum B. Stone
C. Chisel D. Statue

7) NATION : ANTINO :: HUNGRY : ?
A. HNUGRY B. UHNGYR
C. YRNGUH D. UNHGYR

8) Carbon : Diamond :: Corundum : ?
A. Garnet B. Ruby
C. Pukhraj D. Pearl

9) REASON : SFBTPO :: THINK : ?
A. SGHMJ B. UIJOL
C. UHNKI D. UJKPM

10) South : North-West :: West : ?
A. North B. South-West
C. North-East D. East

11) MXN : 13 x 14 :: FXR : ?
A. 14 x 15 B. 5 x 17
C. 6 x 18 D. 7 x 19

12) K/T : 11/20 :: J/R : ?
A. 10/18 B. 11/19
C. 10/8 D. 9/10

13) daisy flower plant
bungalow house ?
A. building B. cottage C. apartment D. city

14) palette easel brush
textbook lesson plan ?
A. artist B. teacher C. report card D. paint

15) rule command dictate
doze sleep ?
A. snore B. govern C. awaken D. hibernate

16) ant fly bee
hamster squirrel ?
A. spider B. mouse C. rodent D. cat

17) Pathology,Cardiology,Radiology, Ophthalmology
A. Biology B. Hematology
C. Zoology D. Geology

18) Root, Stem, Branch
A. Fertilizer B. Leaf
C. Tree D. Wood

19) Arid, Parched, Droughty
A. Draft B. Earth

20) Clutch, Brake, Horn
A. Car B. Scooter

C. Dry D. Cow

21) 'Ophthalmia' is related to 'Eye' in the same way as 'Rickets' is related to:
A. Kidney B. Nose
C. Bone D. Heart

23) 'Jade' is related to 'Green' in the same way as 'Garnet' is related to:
A. Red B. Blue
C. Orange D. Yellow

25) 'Cat' is related to 'Kitten' in the same way as 'Woman' is related to:
A. Puppy B. Colt
C. Calf D. Baby

27) 'Forest' is related to 'Viviparium' in the same way as 'sea' is related to:
A. Port site B. Water
C. Fishery D. Aquarium

29) 'Much' is related to 'Many' in the same way as 'Measure' is related to:
A. Count B. Measures
C. Calculate D. Weigh

31) 'Dogs' is related to 'Bark' in the same way as 'Goats' is related to:
A. Bleat B. Crow
C. Grunt D. Howl

33) 'Rabbit' is related to 'Burrow' in the same way as 'Lunatic' is related to:
A. Prison B. Cell
C. Barrack D. Asylum

C. Accident D. Steering

22) 'Nun' is related to 'Convent' in the same way as 'Hen' is related to:
A. Nest B. Shed
C. Cell D. Cote

24) 'Jackal' is related to 'Howl' in the same way as 'Cow' is related to:
A. Caws B. Hoot
C. Coo D. Moo

26) 'Horse' is related to 'Hoof' in the same way as 'Eagle' is related to:
A. Clutch B. Leg
C. Foot D. Claw

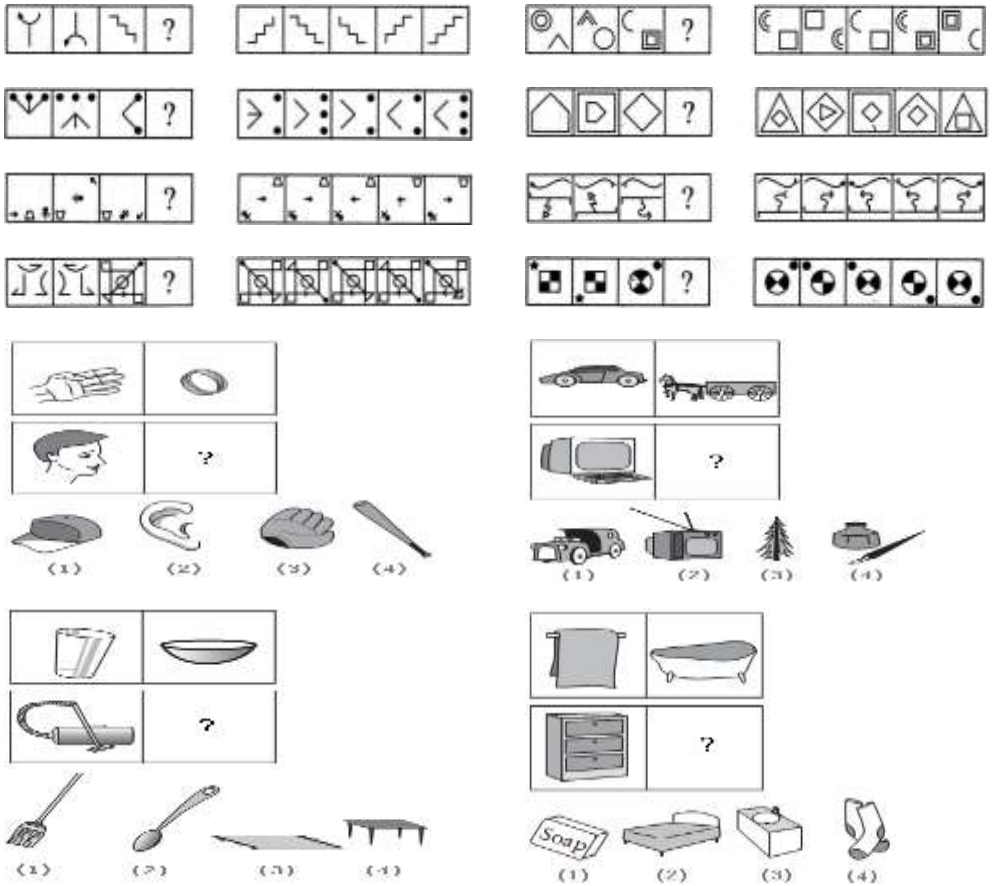
28) 'Wax' is related to 'Grease' in the same way as 'Milk' is related to:
A. Drink B. Ghee
C. Protein D. Curd

30) 'Calf' is related to 'Cow' in the same way as 'Kitten' is related to:
A. Deer B. Bear
C. Cat D. Duck

32) 'Metal' is related to 'Conduction' in the same way as 'Plastic' is related to:
A. Ground oil chemistry B. Industry
C. Inflammability D. Insulation

34) 'Sea' is related to 'Ship' in the same way as 'Road' is related to:
A. Traffic B. Travellers
C. journey D. Bus

Select a suitable figure from the Answer Figures that would replace the question mark (?).



CAUSE AND EFFECT

INTRODUCTION:

In this type of questions two statements are given. Out of these two statements one may be the cause and other the effect or either these two may be independent causes any effect or independent effects of any cause etc.

The following examples will you a clear cut idea to solve this type of problems.

Example 1:

Statements:

1. Ram's father was ill.
2. Ram brought medicine after consulting the doctor.

As Ram's father was ill, he brought medicine on the advice of doctor.

Therefore, I statement is the cause while II statement is the effect.

Example 2:

Statements:
1. The Central Government has recently declared to finish the rebate on farming.
2. The Central Government faces financial loss on account of giving rebate on farming for the last few years.
As the Central Government faced financial loss on accounts of giving rebate on farming for the last few years, therefore, they declared to finish the rebate of farming.
Hence statement II is the cause while statement I is the effect.

EXERCISES

- The prices of food grains and other essential commodities in the open market have risen sharply during the past three months.
- The political party in opposition has given a call for general strike to protest against the government's economic policy.

- The farmers have decided against selling their Kharif crops to the Government agencies.
- The Government has reduced the procurement price of Kharif crops starting from the last month to the next six months.

- Many people visited the religious place during the week-end.
- Few people visited the religious place during the week days.

- The Government has decided to hold a single entrance test for admission to all the medical colleges in India.
- The State Government has debarred students from other States to apply for the seats in the medical colleges in the State.

- The literacy rate in the district has been increasing for the last four years.
- The district administration has conducted extensive training programme for the workers involved in the literacy drive.

- All the schools in the area had to be kept closed for most part of the week.
- Many parents have withdrawn their children from the local schools.

- The government has allowed private airline companies in India to operate to overseas destinations.
- The national air carrier has increased its flights to overseas destinations.

- Many people in the area are reported to be suffering from Malaria.
- Private Medical Practitioners in the area have decided to close their clinics for few days.

- Police had resorted to lathi-charge to disperse the unruly mob from the civic headquarters.
- The civic administration has recently hiked the property tax of the residential buildings by about 30 percent.

- The prices of petrol and diesel in the domestic market have remained unchanged for the past few months.
- The crude oil prices in the International market have gone up substantially in the last few months.

- The employees of the biggest bank in the country have given an indefinite strike call starting from the third of the next month.
- The employees of the Central Government have withdrawn their week long demonstrations.

- Police resorted to lathi-charge to disperse the unlawful gathering of large number of people.
- The citizens' forum called a general strike in protest against the police atrocities.

- Large number of Primary Schools in the rural areas is run by only one teacher.
- There has been a huge dropout from the primary schools in rural areas.

- The university officers have decided to conduct last examination every year in March/April in order to announce the result at proper time.
- In past the result was declared late by the University due to the lack of number of examiners.

- The car manufacturing companies have recently increased the prices of mid-sized cars.
- The Government recently increased the duty on mid-sized cars.

- The State Government has announced special tax package for the new industries to be set-up in the State.
- Last year the State Government had hiked the taxes for all industrial activities in the State.

- The Government has imported large quantities of sugar as per trade agreement with other countries.
- The prices of sugar in the domestic market have fallen sharply in the recent months.
- The vegetable prices in the local market have increases manifold during the past few days.
- Incessant rains have created flood like situation in most rural parts of the State.

- There was a huge rush of people to the temple last Sunday the 15th of the month.
- The temple authority had decided to close down the temple for repairs from 17th of the month.

- Large number of people living in the low lying areas has been evacuated during the last few days to safer places.
- The Government has rushed in relief supplies to the people living in the affected areas.

SYLLOGISM

INTRODUCTION:

The questions which are asked in this section contain two or more statements and these statements are followed by two or more conclusions. You have to find out which of the conclusions logically follow from the given statements. The statements have to be taken true even if they seem to be at variance from the commonly known facts.

For such questions, you can take the help of Venn Diagrams. On the basis of the given statements, you should draw all the possible diagrams, and then derive the solution from each of these diagrams separately. Finally, the answer common to the all the diagrams is taken.

Example 1:

Statements:

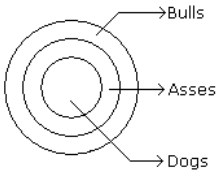
1. All dogs are asses. 2. All asses are bulls.

Conclusions:

1. Some dogs are not bulls. 2. Some bulls are dogs.
3. All bulls are dogs. 4. All dogs are bulls.

Solution:

On the basis of both statements, the following one diagram is possible.



From the diagram it is clear that (2) and (4) conclusions logically follow.

Example 2:

Statements:

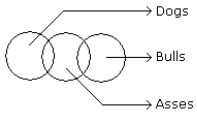
1. Some dogs are asses. 2. Some asses are bulls.

Conclusions:

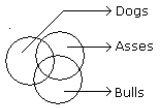
1. Some asses are not dogs. 2. Some dogs are bulls.

Solution:

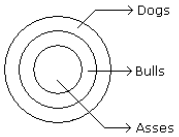
From these given statements the following diagrams are possible:



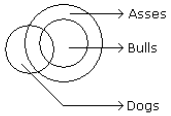
(1)



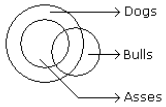
(2)



(3)



(4)



(5)

From the diagram neither (1) nor (2) conclusions follow.

EXERCISES

1) Statements: Some pearls are jewels. Some jewels are ornaments.
Conclusions:
Some jewels are pearls.
Some ornaments are jewels.

2) Statements: Some hens are cows. All the cows are horses.
Conclusions:
Some horses are hens.
Some hens are horses.

3) Statements: Some papers are pens. All the pencils are pens.
Conclusions:
Some pens are pencils.
Some pens are papers.

4) Statements: All the actors are girls. All the girls are beautiful.
Conclusions:
All the actors are beautiful.
Some girls are actors.

5) Statements: All the flowers are leaves. Some leaves are birds.
Conclusions:
Some birds are flowers.
Some leaves are flowers.

6) Statements: All the windows are doors. No door is a wall.
Conclusions:
Some windows are walls.
No wall is a door.

7) Statements: All cups are books. All books are shirts.
Conclusions:
Some cups are not shirts.
Some shirts are cups.

8) Statements: Some cows are crows. Some crows are elephants.
Conclusions:
Some cows are elephants.
All crows are elephants.

9) Statements: All the pencils are pens. All the pens are inks.
Conclusions:
All the pencils are inks.
Some inks are pencils.

10) Statements: Some dogs are bats. Some bats are cats.
Conclusions:
Some dogs are cats.
Some cats are dogs.

11) Statements: All the trucks are flies. Some scooters are flies.
Conclusions:
All the trucks are scooters.
Some scooters are trucks.

12) Statements: All buildings are chalks. No chalk is toffee.
Conclusions:
No building is toffee
All chalks are buildings.

13) Statements: All cars are cats. All fans are cats.
Conclusions:
All cars are fans.
Some fans are cars.

14) Statements: No door is dog. All the dogs are cats.
Conclusions:
No door is cat.
No cat is door.
Some cats are dogs.
All the cats are dogs.

15) Statements: All green are blue. All blue

16) Statements: All men are vertebrates.

are white.
Conclusions:
Some blue are green.
Some white are green.
Some green are not white.
All white are blue.

17) Statements: All the phones are scales. All the scales are calculators.
Conclusions:
All the calculators are scales.
All the phones are calculators
All the scales are phones.
Some calculators are phones.

18) Statements: Some cars are scooters. No scooter is cycle.
Conclusions:
No car is cycle.
No scooter is car.
Some cars are cycles.
Some scooters are cars.

19) Statements: All the locks are keys. All the keys are bats. Some watches are bats.
Conclusions:
Some bats are locks.
Some watches are keys.
All the keys are locks.

20) Statements: Some keys are staplers. Some staplers are stickers. All the stickers are pens.
Conclusions:
Some pens are staplers.
Some stickers are keys.
No sticker is key.
Some staplers are keys.

21) Statements: Some questions are answers. Some answers are writers. All the writers are poets.
Conclusions:
Some writers are answers.
Some poets are questions.
All the questions are poets.
Some poets are answers.

22) Statements: Some envelops are gums. Some gums are seals. Some seals are adhesives.
Conclusions:
Some envelopes are seals.
Some gums are adhesives.
Some adhesives are seals.
Some adhesives are gums

23) Statements: All the papers are books. All the bags are books. Some purses are bags.
Conclusions:
Some papers are bags.
Some books are papers.
Some books are purses.

24) Statements: Some rats are cats. Some cats are dogs. No dog is cow.
Conclusions:
No cow is cat.
No dog is rat.
Some cats are rats.

25) Statements: All the books are papers. Some papers are journals. Some journals are calendars.
Conclusions:
Some journals are books.
Some calendars are papers.
Some books are journals.
Some books are calendars.

26) Statements: All the bottles are boxes. All the boxes are bags. Some bags are trays.
Conclusions:
Some bottles are trays.
Some trays are boxes.
All the bottles are bags.
Some trays are bags.

27) Statements: Some cars are jeeps. All the boxes are jeeps. All the pens are cars.
Conclusions:
Some cars are boxes.
No pen is jeep.
Some boxes are cars.

28) Statements: Some tables are T.V. Some T.V. are radios.
Conclusions:
Some tables are radios.
Some radios are tables.
All the radios are T.V.
All the T.V. are tables.

29) Statements: Some pens are books. Some books are pencils.
Conclusions:
Some pens are pencils.
Some pencils are pens.
All pencils are pens.
All books are pens.

30) Statements: All the goats are tigers. All the tigers are lions.
Conclusions:
All the goats are lions.
All the lions are goats.
Some lions are goats.
Some tigers are goats.

CLASSIFICATION

EXERCISES

Choose the word which is different from the rest.

1) A. Cap B. Turban C. Helmet D. Veil E. Hat

2) A. Kiwi B. Eagle C. Emu D. Ostrich

3) A. Rigveda B. Yajurveda C. Atharvaveda D. Ayurveda E. Samveda

4) A. Curd B. Butter C. Oil D. Cheese E. Cream

5) A. Pear B. Apple C. Litchi D. Guava E. Orange

6) A. Dagger B. Hammer C. Knife D. Sword E. Blade

7) A. Oyster B. Whelk C. Scallop D. Mussel E. Clam

8) A. Producer B. Director C. Investor D. Financier E. Entrepreneur

9) A. Tricycle B. Trident C. Trifle D. Tricolour E. Trilogy

10) A. Chameleon B. Crocodile C. Alligator D. Locust E. Salamander

Choose the pair in which the words are differently related (does not bear a common relationship)

11) A. Scalpel : Surgeon

12) A. Beans : Pulses

B. Chisel : Soldier
C. Awl : Cobbler
D. Knife : Chef

13) A. Pelican : Reptile
B. Gnu : Antelope
C. Elk : Deer
D. Shark : Fish

14) A. Malaria : Protozoa
B. Yeast: Fungi
C. Typhoid : Bacteria
D. Polio : Virus

15) A. Chandragupta : Mauryan
B. Babar : Mughal
C. Kanishka : Kushan
D. Mahavira : Jainism

16) A. Flurry : Blizzard
B. Moisten: Drench
C. Prick : Stab
D. Scrub : Polish

17) A. Saw : Wood
B. Pen : Paper
C. Author : Book
D. Chalk : Blackboard

18) A. Twigs : Nest
B. Wood : Furniture
C. Pitcher : Pottery
D. Gold : Ornaments

19) A. Broom : Sweep
B. Spoon : Feed
C. Nut : Crack
D. Soap : Bathe

20) A. Deer : Flesh
B. Crane : Fish
C. Crow : Carrion
D. Mongoose : Snake

21) A. Solder : Tin
B. Haematite : Iron
C. Bauxite : Aluminium
D. Malachite : Copper

22) A. Donald : Comedy
B. Holmes : Suspense
C. Premchand : Novel
D. Robinson : Adventure

23) A. Onomatology : Names
B. Nidology : Nests
C. Phycology : Algae
D. Concology : Shells

24) A. Cow : Fodder
B. Crow : Carrion
C. Poultry : Farm
D. Vulture : Prey

25) A. Fish : Pisciculture
B. Birds : Horticulture
C. Bees : Apiculture
D. Silkworm : Sericulture

26) A. Aphid : Paper
B. Moth : Wool
C. Termite : Wood
D. Locust: Plant

Which word does NOT belong with the others?

27) A. inch B. ounce C. centimeter D. yard

28) A. tulip B. rose C. bud D. daisy

29) A. rye B. sourdough C. pumpernickel D. loaf

30) A. dodge B. flee C. duck D. avoid

31) A. tape B. twine C. cord D. yarn

32) A. leopard B. cougar C. elephant D. lion

33) A. couch B. rug C. table D. chair

34) A. cornea B. retina C. pupil D. vision

35) A. noun B. preposition C. punctuation D. adverb

36) A. peninsula B. island C. bay D. cape

37) A. fair B. just C. equitable D. favorable

38) A. acute B. right C. obtuse D. parallel

39) A. scythe B. knife C. pliers D. saw

40) A. evaluate B. assess C. appraise D. instruct

LOGICAL SEQUENCE OF WORDS

EXERCISES

In this type of question, some words are given. You have to arrange these words in a meaningful order. The order may be according to age, size and need etc.

1) 1. Key 2. Door 3. Lock 4. Room 5. Switch on

2) 1. Word 2. Paragraph 3.Sentence 4. Letters 5. Phrase

3) 1. Police 2. Punishment 3. Crime 4. Judge 5. Judgement

4) 1. Family 2. Community 3. Member 4. Locality 5.Country

5) 1. Poverty 2. Population 3. Death 4. Unemployment 5. Disease

6) 1. Never 2. Sometimes 3. Generally 4. Seldom 5. Always

7) 1. Windows 2. Walls 3. Floor 4. Foundation 5. Roof 6. Room

8) 1. Cut 2. Puton 3. Mark 4. Measure 5. Tailor

9) 1. House 2. Street 3. Room 4. Town 5. District

10) 1.Probation 2.Interview 3. Selection 4.Appointment 5. Advertisement 6. Application

11) 1. Index 2. Contents 3. Title 4. Chapters 5. Introduction

12) 1. Income 2. Status 3. Education 4. Well-being 5. Job

13) 1. Table 2. Tree 3. Wood 4. Seed 5. Plant

14) 1. Table 2. Tree 3. Wood 4. Seed 5.Plant

15) 1. Windows 2. Walls 3. Floor 4. Foundation 5. Roof 6. Room

16) 1. Presentation 2. Recommendation 3. Arrival 4. Discussion

5.Introduction

17) 1. Butterfly 2. Cocoon 3. Egg 4. Worm

18) 1. Rain 2. Monsoon 3. Rescue 4. Flood 5. Shelter 6. Relief

19) 1. Milky way 2. Sun 3. Moon 4. Earth 5. Stars

20) 1. Foetus 2. Child 3. Baby 4. Adult 5. Youth

21) 1. Sea 2. Rivulet 3. Ocean 4. River 5. Glacier

22) 1. Doctor 2. Fever 3. Prescribe 4. Diagnose 5. Medicine

23) 1. Reading 2. Composing 3. Writing 4. Printing

24) 1. Hecto 2. Centi 3. Deca 4. Kilo 5. Deci

25) 1. Honey 2. Flower 3. Bee 4. Wax

26) 1. Country 2. Furniture 3. Forest 4. Wood 5. Trees

27) 1. Site 2. Plan 3. Rent 4. Money 5. Building 6. Construction

28) 1. Key 2. Door 3. Lock 4. Room 5. Switch on

29) 1. Rainbow 2. Rain 3. Sun 4. Happy 5. Child

30) 1. Cutting 2. Dish 3. Vegetable 4. Market 5. Cooking

31) 1. Elephant 2. Cat 3. Mosquito 4. Tiger 5. Whale

32) 1. Cut 2. Put on 3. Mark 4. Measure 5. Tailor

33) 1. Yarn 2. Plant 3. Saree 4. Cotton 5. Cloth

34) 1. Police 2. Punishment 3. Crime 4. Justice 5. Judgement

35) 1. Patient 2. Diagnosis 3. Bill 4. Doctor 5. Treatment

36) 1. Atomic Age 2. Metallic Age 3. Stone Age 4. Alloy Age

VERBAL REASONING

EXERCISES

Find the statement that must be true according to the given information.

1) 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.

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.

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.

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.

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.

6) Sara lives in a large city on the East Coast. Her younger cousin Marlee lives in the Mid-west 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.

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.

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

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.

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.

ANALYZING ARGUMENTS

EXERCISES

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 interested in the work of Shakespeare.
E. Shakespeare was a psychiatrist as well as a playwright.

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.

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.

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.

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.

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.

I. 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.

II. 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.

III. 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.

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.

I. 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

II. 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

III. 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

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.

I. 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

II. On what does Quinn rely in making her argument?
A. statistics B. emotion C. fairness D. anecdotes E. actualities

III. On what does Dakota rely in making her argument?
A. statistics B. emotion C. fairness D. anecdotes E. actualities

VERIFICATION OF TRUTH

EXERCISES

1) Which one of the following is always with 'Bargain'?
A. Exchange B. Sumptuousness
C. Triviality D. Eloquence

2) My ten years old niece is taller than my twelve years old son:
A. Always B. Never
C. Often D. Sometimes

3) Which one of the following is always found in 'Phrase'?
A. Nomenclature B. Manifestation
C. Pictorial effect D. Glossary

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

5) Danger always involves
A. Enemy B. Attack
C. Fear D. Help

6) Which one of the following is always found in 'Remedy of fault'?
A. Punishment B. Remedy
C. Fault D. Scolding

7) 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

8) A mirror always
A. Retracts B. Distorts
C. Refracts D. Reflects

9) A bulb always has
A. Glass B. Current

10) Which one of the following is always found in 'Wonder'?

C. Filament D. Light

11) Disclosure always involves
A. Agents B. Display
C. Exposition D. Secrets

12) What is always in worry?
A. Difficulty B. Unrest
C. Non-Cooperation D. Poignancy

13) Which one of the following is always associated with 'tree'?
A. Flowers B. Leaves
C. Fruits D. Roots

14) Which one of the following is always associated with 'justice'?
A. Hypocrisy B. Legitimate
C. Magnanimity D. Diminutiveness

15) A hill always has
A. Trees B. Height
C. Animals D. Water

16) What is found necessarily in newspaper?
A. Date B. Advertisement
C. News D. Editor

17) Controversy always involves
A. Dislike B. Injustice
C. Disagreement D. Passion

18) Which one of the following is always in 'Sentiment'?
A. Cruelty B. Insight
C. Neutrality D. Emotion

19) A camera always has
A. Reels B. Flash
C. Stand D. Lens

20) What is found necessarily in a race?
A. Judge B. Spectators
C. Competitor D. Prize

BLOOD RELATION TEST

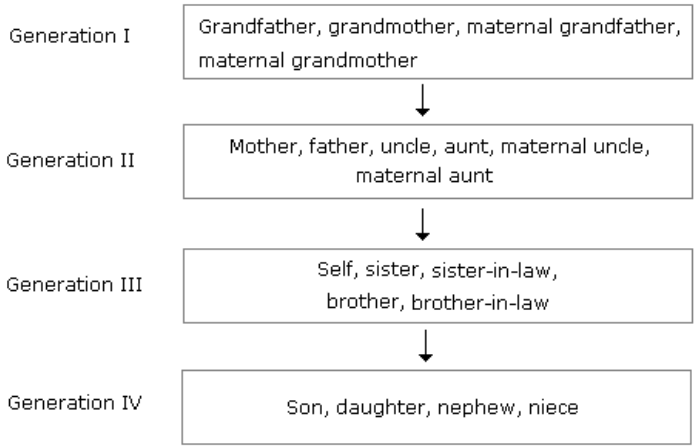
INTRODUCTION

The questions which are asked in this section depend upon Relation. You should have a sound knowledge of the blood relation in order to solve the questions. To remember easily the relations may be divided into two sides as given below:

1. Relations of Paternal side:
   1. Father's father → Grandfather
   2. Father's mother → Grandmother
   3. Father's brother → Uncle
   4. Father's sister → Aunt
   5. Children of uncle → Cousin
   6. Wife of uncle → Aunt
   7. Children of aunt → Cousin
   8. Husband of aunt → Uncle

2. Relations of Maternal side:
   1. Mother's father → Maternal grandfather
   2. Mother's mother → Maternal grandmother
   3. Mother's brother Maternal uncle
   4. Mother's sister → Aunt
   5. Children of maternal uncle → Cousin
   6. Wife of maternal uncle → Maternal aunt

Relations from one generation to next:



Different types of questions with explanation:

Type 1:

If A + B means A is the mother of B; A x B means A is the father of B; A $ B means A is the brother of B and A @ B means A is the sister of B then which of the following means P is the son of Q?

(A) Q + R @ P @ N (B) Q + R * P @ N
(C) Q x R $ P @ N (D) Q x R $ P $ N

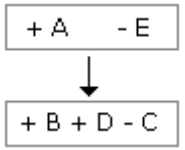
Solution: (D)

Q x R = Q is the mother of R [-Q, ±R]
R $ P = R is the brother of P [+ R, ±P]
P $ N = P is the brother of N [+ P, ±N]
Therefore P is the son of Q.

Type 2:

A has 3 children. B is the brother of C and C is the sister of D, E who is the wife of A is the mother of D. There is only one daughter of the husband of E. what is the relation between D and B?

Solution: With the chart



Therefore, D is a boy because there is only one daughter of E.
Hence, B is the brother of D.

Type 3:

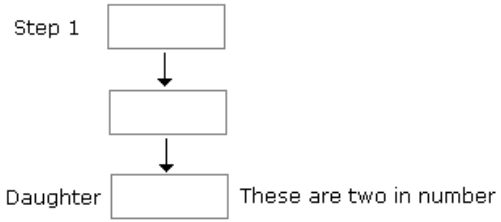
Pointing to a photograph, Rekha says to Lalli, "The girl in the photo is the second daughter of the wife of only son of the grandmother of my younger sister." How this girl of photograph is related to Rekha?

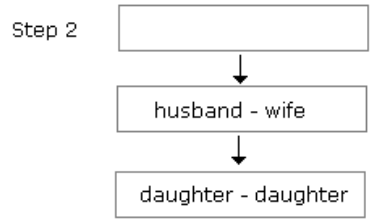
Solution: First method:

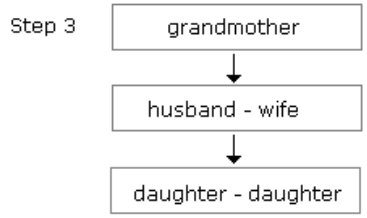
1. Grandmother of younger sister of Rekha → Grandmother of Rekha
2. Wife of only son of grandmother → Mother of Rekha
3. Younger daughter of the mother → Younger sister.

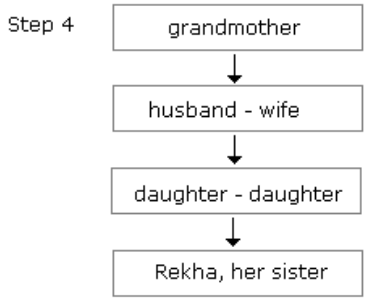
   Note: While solving the question (+) can be used for male and (-) can be used for female.

Second Method - By Generating Charts:









EXERCISES

1) 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

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 B. P + S x N - Q
   C. P - M + N x Q D. Q - S % P

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 B. Sister
   C. Nephew D. Cannot be determined

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 B. F - C + N x M
   C. N + M - F x C D. M x N - C + F

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 B. Nephew
   C. Uncle D. Son-in-law

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 B. Only 2
   C. Either 1 or 2 D. 1 and 2 both are required

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 B. M x N - S % T
   C. M x S - N % T D. M x N x S % 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) B. Only (2)
   C. Either (1) or (2) D. (1) and (2) both

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

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

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

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
C. Sister D. Cannot be determined

13) 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

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

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

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 D. Brother-in-law

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.
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
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

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.
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
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

MATCHING DEFINITIONS

EXERCISES

Read each definition and all four choices carefully, and find the answer that provides the best example of the given 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.

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.

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.

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.

5) Reentry occurs when a person leaves his or her social system for a period of time and then returns. Which situation

6) A Tiebreaker is an additional contest or period of play designed to establish a winner among tied contestants. Which

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.

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.

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.

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.

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.

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.

THEME DETECTION

EXERCISES

Each of the following questions contains a small paragraph followed by a question on it. Read each paragraph carefully and answer the question given below it.

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.

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.

3) The school has always been the most important means of transferring the wealth of tradition form one generation to the next. This applies today in an even

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

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.

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.

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.

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 that are industrially backward.
D. boost up production qualitatively and quantitatively by analytical comparison of a country's products with those of the developed countries.

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 results from inadequate machinery.

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 leveler of men.

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 organizations.
C. interpersonal skills will become more important in the future work place.
D. manufacturing organizations ignore importance of people.
E. service organizations will not deal with objects and things.

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 realizes his dreams through his artistic creation.
E. artist should use his art for the sake of society.