Quantitative Aptitude:

Chapter 1: Number Series

Find the next number/s, or missing numbers in the following series

1. 5, 9, 13, 17, __, __, __ .

a. 21, 25, 29 b. 22, 25, 29 c. 21, 26, 29 d. 21, 25, 29 **(Ans: a.)**

Solution: $9 - 5 = 4$, $13 - 9 = 4$, $17 - 13 = 4$,

$17 + 4 = 21$, $21 + 4 = 25$, $25 + 4 = 29$

2. 27, 21, 15, 9, __, __, __.

a. -3, 3, -9 b. 3, -3, -9 c. -9, -3, 3 d. 3, -3, -9 **(Ans: b.)**

Solution: $27 - 21 = 6$, $21 - 15 = 6$, $15 - 9 = 6$

$9 - 6 = 3$, $3 - 6 = -3$, $-3 - 6 = -9$

3. 3, 6, 12, 24, __, __, __.

a. 47, 95 b. 48, 95 c. 48, 96 d. 47, 94 **(Ans: c.)**

Solution: $3*2 = 6$, $6*2 = 12$, $12*2 = 24$

$24*2 = 48$, $48*2 = 96$, $96*2 = 192$

4. 8, 27, 64, __, __.

a. 125, 216 b. 124, 215 c. 123, 214 d. 121, 200 **(Ans: a.)**

Solution: $8 = 2^3$, $27 = 3^3$, $64 = 4^3$

$125 = 5^3$, $216 = 6^3$

5. 4, 6, 9, 13, 18, _, _, _.

a. 25, 30, 38 b. 24, 31, 39 c. 23, 30, 38 d. 24, 31, 39 **(Ans: b.)**

Solution: $6 - 4 = 2$, $9 - 6 = 3$, $13 - 9 = 4$, $18 - 13 = 5$

$18 + 6 = 24$, $24 + 7 = 31$, $31 + 8 = 39$

6. 7, 9, 13, 19, 27, _, _, _.

a. 36, 49, 60 b. 36, 49, 63 c. 37, 49, 63 d. 37, 49, 62 **(Ans: c.)**

Solution: $9 - 7 = 2$, $13 - 9 = 4$, $19 - 13 = 6$, $27 - 19 = 8$,

$27 + 10 = 37$, $37 + 12 = 49$, $49 + 14 = 63$

7. 3/4, 5/7, 7/10, 9/13, _, _, _.

a. 10/15, 13/19, 15/22 b. 11/16, 13/19, 15/22 c. 11/15, 12/18, 14/21

d. 11/16, 12/18, 15/21 **(Ans: b.)**

Solution: For Numerator: $5 - 3 = 2$, $7 - 5 = 2$, $9 - 7 = 2$

$9 + 2 = 11$, $11 + 2 = 13$, $13 + 2 = 15$ (11, 13, 15)

For Denominator: $7 - 4 = 3$, $10 - 7 = 3$, $13 - 10 = 3$,

$13 + 3 = 16$, $16 + 3 = 19$, $19 + 3 = 22$ (16, 19, 22)

8. 11/4, 8/9, 5/16, _, _.

a. 2/25, -1/36 b. 2/36, -1/49 c. 1/25, 2/36 d. 2/25, 1/36 **(Ans: a.)**

Solution: For Numerator: $11 - 8 = 3$, $8 - 5 = 3$,

$5 - 3 = 2$, $2 - 3 = -1$.

For Denominator: $4 = 2^2$, $3^2 = 9$, $4^2 = 16$

$5^2 = 25$, $6^2 = 36$

9. 89, 80, 72, 65, 59, _, 50

a. 52 b. 53 c. 54 d. 50 **(Ans: c.)**

Solution: $89 - 80 = 9$, $80 - 72 = 8$, $72 - 65 = 7$, $65 - 59 = 6$,

$59 - 5 = 54$, $54 - 50 = 4$

10. 2, 7, 14, 23, 34, _, 62.

a. 47 b. 46 c. 45 d. 44 **(Ans: a.)**

Solution: $7 - 2 = 5$, $14 - 7 = 7$, $23 - 14 = 9$, $34 - 23 = 11$

$34 + 13 = 47$, $62 - 47 = 15$

11. 6, 12, 24, 48, _, 192.

a. 96 b. 98 c. 102 d. 95 **(Ans: a.)**

Solution: 6*2 = 12, 12*2 = 24, 24*2 = 48,

48*2 = 96, 96*2 = 192

12. 2, 3, 7, 16, 32, 57, 93, _, 206.

a. 141 b. 143 c. 142 d. 141 **(Ans: c.)**

Solution: $3 - 2 = 1\ (1^2)$, $7 - 3 = 4\ (2^2)$, $16 - 7 = 9\ (3^2)$, $32 - 16 = 16\ (4^2)$, $57 - 32 = 25\ (5^2)$,

$93 - 57 = 36\ (6^2)$, $93 + 49 = 142\ (7^2)$, $206 - 142 = 64\ (8^2)$.

13. 5, 6, 14, 23, 87, 112, 328, _.

a. 376 b. 378 c. 377 d. 374 **(Ans: c.)**

Solution: $6 - 5 = 1\ (1^2)$, $14 - 6 = 8\ (2^3)$, $23 - 14 = 9\ (3^2)$, $87 - 23 = 64\ (4^3)$,

$112 - 87 = 25\ (5^2)$, $328 - 112 = 216\ (6^3)$, $328 + 49 = 377$.

14. 3, 4, 6, 9, 14, 21, 32, _, 62, 81.

a. 44 b. 45 c. 46 d. 47 **(Ans: b.)**

Solution: $4 - 3 = 1$, $6 - 4 = 2$, $9 - 6 = 3$, $14 - 9 = 5$, $21 - 14 = 7$, $32 - 21 = 11$,

$32 + 13 = 45$, $62 - 45 = 17$, $81 - 62 = 19$.

15. 2, 3, 7, 16, 41, 90, __, 380, 669.

a. 210 b. 211 c. 209 d. 208 **(Ans: b.)**

Solution: $3 - 2 = 1\ (1^2)$, $7 - 3 = 4\ (2^2)$, $16 - 7 = 9\ (3^2)$, $41 - 16 = 25\ (5^2)$

$90 - 41 = 49\ (7^2)$, $90 + 121\ (11^2) = 211$, $380 - 211 = 169\ (13^2)$, $669 - 380 = 289\ (17^2)$

16. 48, 24, 12, _, _, _.

a. 6, 3, 1.5 b. 1.5, 3, 6 c. 1.5, 3, 3 d. 9, 6, 3 **(Ans: a.)**

Solution: 48/2 = 24, 24/2 = 12, 12/2 = 6, 6/2 = 3, 3/2 = 1.5

17. 1, 2, 3, 10, __.

a. 99 b. 89 c. 79 d. 69 **(Ans: a.)**

Solution: $1^2 + 1 = 2$, $2^2 - 1 = 3$, $3^2 + 1 = 10$, $10^2 - 1 = 99$

18. 1536, 384, 96, __.

a. 22 b. 23 c. 24 d. 21 **(Ans: c.)**

Solution: 1536/4 = 384, 384/4 = 96, 96/4 = 24.

19. 4, 20, 7, 14, 10, 8, 13, _, _.

a. 2, 18 b. 2, 14 c. 2, 16 d. 2, 15 **(Ans: c.)**

Solution: Even Place: 20 – 14 = 6, 14 – 8 = 6, 8 – 6 = 2.

Odd Place: 7 – 4 = 3, 10 – 7 = 3, 13 – 10 = 3, 13 + 3 = 16.

20. 52, 50, 48, 44, 42, 40, 36, _, _.

a. 32, 34 b. 34, 32 c. 36, 34 d. 36, 38 **(Ans: b.)**

Solution: 52 – 50 = 2, 50 – 48 = 2, 48 – 44 = 4,

44 – 42 = 2, 42 – 40 = 2, 40 – 36 = 4,

36 – 2 = 34, 34 – 2 = 32.

Quantitative Aptitude

Chapter 2: Number System

Divisibility Rule:

Sl. No.	Number	Rule
a.	2	Last Digit must be a even number. E.g.: 24 – The last digit is 4 which is a even number. So, the number is divisible by 2.
b.	3	The sum of the digits must be divisible 3. E.g.: 963 – The sum of the digits is 9 + 6 + 3 = 18. The sum is 18 which is divisible by 3, Therefore, the whole number 963 is divisible by 3.
c.	4	The last two digit must be divisible by 4. E.g.: 344 – The last 2 digit is 44, 44 is divisible by 4. Therefore, the number 344 is divisible by 4.
d.	5	The last digit of the number is 0 and 5. E.g.: 50585 – The last digit is 5. Therefore, the number 50585 is divisible by 5.
e.	6	The number must be divisible by 2 and 3. E.g.: 36 – The last digit is 6, which is an even number. Therefore, the number is divisible by 2. The total of the digits is 3 + 6 = 9. The sum is 9 which is divisible by 3, therefore the number 36 is divisible by 3. Therefore, the number 36 is divisible by 6 (36 – Divisible by 2 & 3).
f.	7	• Take the last digit and then double the last digit. • Subtract the result from the remaining number. • If the number is '0' or a multiple of '7', then the original number is divisible by '7'. E.g.: 245 – The last number is 5, 5*2 = 10, the remaining number is 24. Subtract 10 from 24 is 14. Therefore, 14 is divisible by 7, the number 245 is divisible by 7.
g.	8	The last 3 digit must be divisible by 8. E.g.: 1448 – The last three digit is 448, which is divisible by 8. Therefore, the number is divisible by 8.

h.	**9**	If the sum of the digits is divisible by 9. E.g.: 9018 – The sum of the digits 9 + 0 + 1 + 8 = 18. The sum is 18 which is divisible by 9. Therefore, the number 9018 is divisible by 9.
i.	**10**	The last digit must be zero. E.g.: 100 – The last digit is 0. Therefore, the number 100 is divisible by 10.
j.	**11**	If the difference of the sum of alternatives digit of a number must be zero. E.g.: 121 – The sum of the even place is 1 + 1 = 2, the sum of the odd place is 2. The difference of the odd and even place 2 – 2 = 0. Therefore, the number 121 is divisible by 11.
k.	**12**	The number must be divisible by both 3 and 4. E.g.: 24 – The last digit is 4, which is an even number. Therefore, the number is divisible by 2. The total of the digits 2 + 4 = 6. The sum is 6 which is divisible by 3, therefore the number 24 is divisible by 3. Therefore, the number 24 is divisible by 12 (12 – Divisible by 3 and 4)
l.	**13**	Multiply the last digit by 4 and add the result with the remaining digit. E.g.: 333957 – The last digit is 7, 7*4=28, the remaining number is 33395. Add the number 28 to 33395. The number is 33423. Now the digit is 33423, the last digit is 3, 3*4 = 12, the remaining number is 3342. Add the number 12 to 3342. The number is 3354. Now the digit is 3354, the last digit is 4, 4*4 = 16, the remaining number is 335. Add the number 16 to 335. The number is 351. Now the digit is 351, the last digit is 1, 1*4 = 4, the remaining number is 35. Add the number 4 to 35. The number is 39. The number is 39 divisible by 13. Therefore, the number 333957 is divisible by 13.
m.	**14**	The number must be divisible by both 2 and 7. E.g.: 28 – The number 28 satisfies the divisibility of both 2 and 7. Therefore the number is divisible by 14.

n.	**15**	The number must be divisible by both 3 and 5. E.g.: 45 -The number 45 satisfies the divisibility of both 3 and 5. Therefore the number is divisible by 15.
o.	**17**	Multiply the last digit by 5 and subtract the result with the remaining digit. The result should be divisible by 17. E.g.: 28730 – The last digit is 0, 0*5 = 0, the remaining number is 2873. Subtract the number 0 to 2873. The number is 2873. Now the digit is 2873, the last digit is 3, 3*5 = 15, the remaining number is 287. Subtract the number 15 to 287. The number is 272. Now the digit is 272, the last digit is 2, 2*5 = 10, the remaining number is 27. Subtract the number 10 to 27. The number is 17. The number 17 is divisible by 17. Therefore, the number 28730 is divisible by 17.
p.	**19**	Multiply the units place by 2 and add the remaining. If the result is divisible by 19, then the number is divisible by 19. E.g.: 12635 – The last digit is 5, 5*2 = 10, the remaining number is 1263. Add the number 10 to 1263. The number is 1263. Now the digit is 1273. 3*2=6, the remaining number is 127. Add the number 6 to 127. The number is 133. Now the digit is 133. 3*2 = 6, the remaining number is 13. Add the number 6 to 19. The number 19 is divisible by 19. Therefore, the number 12635 is divisible by 19.

1. In the number 257368 the face value of 7 and place value of 7 is _____.

a. 7 & 7000 b. 7000 & 7 c. 7 & 1000 d. 1000 & 7 **(Ans: a.)**

Solution: Face Value – 7; Place Value – 7000.

2. The sum of the place value and face value of 3 in 63897 is _____.

a. 3000 b. 1003 c. 3003 d. 3300 **(Ans: c.)**

Solution: 3000 + 3 = 3003 (Place Value – 3000; Face Value – 3).

3. Without Actual Division, find which of the following numbers are divisible by 2, 3, 4, 7, 9, 10, 11.

a. 36324 b. 2211 c. 87120 d. 473312 **(Ans: c.)**

Solution: a. 87120: For 2 – It is divisible by 2 because 0 (units place) is divisible by 2.

For 3 – It is divisible by 3 because $8 + 7 + 1 + 2 + 0 = 18$ is divisible by 3. Therefore, the number is divisible by 3.

For 4 – It is divisible by 4 because the last two digits of the number 20 is divisible by 4.

For 5 – Number 87120 is divisible by 5.

For 7 – Number 87120 doesn't satisfy the divisibility rule of 7. Therefore, the number is not divisible by 7.

For 9 – It is divisible by 9 because $8 + 7 + 1 + 2 + 0 = 18$ is divisible by 9. Therefore, the number is divisible by 9.

For 10 – Number 87120 satisfy the divisibility rule of 10.

For 11 – Number 87120 satisfy the divisibility rule of 11.

4. The last digit in 5^{2023} is _____.

a. 5 b. 10 c. 0 d. 3 **(Ans: a.)**

Solution: $5^2 – 25$, $5^3 – 125$. The last digit is 5 when we take the square or cube of 5. Therefore, the last digit of 5^{2023} is 5.

5. If the number 197M5462 is divisible by 9 then the value of M is

a. 2 b. 3 c. 1 d. 4 **(Ans: a.)**

Solution: $1 + 9 + 7 + M + 5 + 4 + 6 + 2 = 34 + M$. $9 * 4 = 36$, therefore the number to be added to 34 is 2 (36 – 34).

6. If the number 245678N is divisible by 11, then the value of N is

a. 4 b. 3 c. 8 d. 5 **(Ans: a.)**

Solution: (2+5+7+N) 14+N – (4+6+8) 18, $14 + N = 18$, $N = 18 - 14$, $N = 4$.

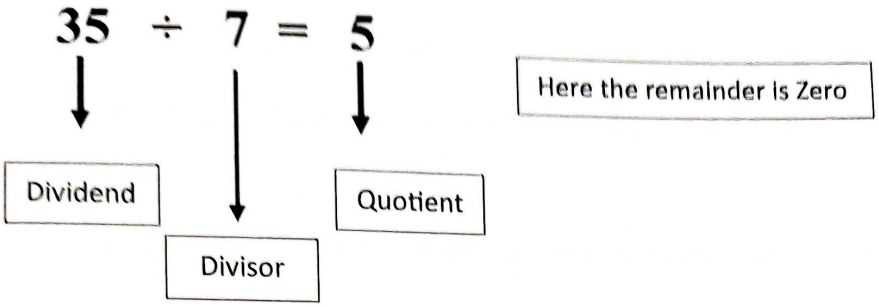
7. If the number 62684PQ is divisible by 8 and 5 then value of P and Q are

a. 3 and 0 b. 8 and 0 c. 5 and 0 d. 0 and 5 **(Ans: b.)**

Solution: For 5: The last digit must be 0 and 5, therefore Q need to be 0, which is more suitable.

For 8: The last 3 digit must be divisible by 3. As per the substitution of the option 8 is suitable for the place of P. Thus, P is 8 and Q is 0.

Note:



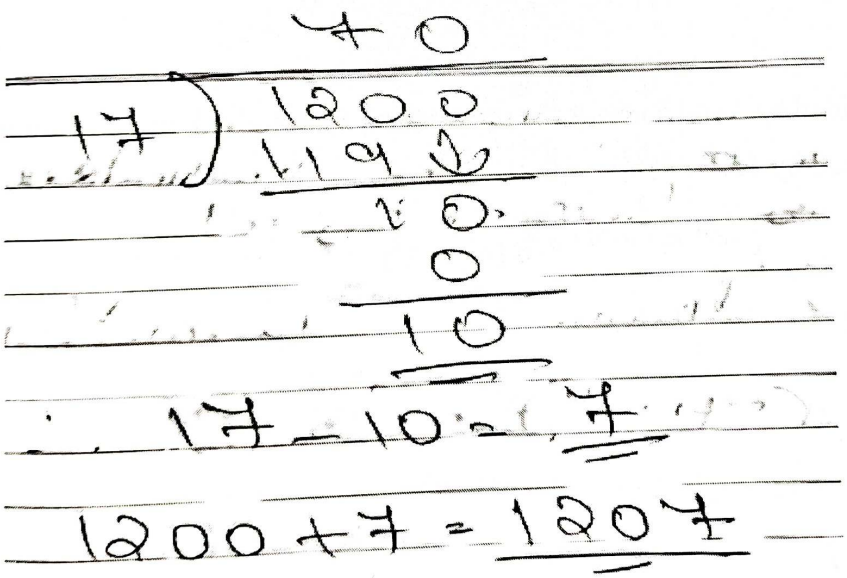
8. Find the least number to be subtracted from 1000 so that the new number is divisible by 23.

a. 11 b. 15 c. 16 d. 18 **(Ans: a.)**

Solution: 1000 ÷ 23 = the remainder is 11. Therefore, the least number to be subtracted from 1000 is 11.

9. What is the least number to be added to 1200 so that the number is divisible by 17.

a. 5 b. 7 c. 8 d. 9 **(Ans: b.)**



10. What is the value of M and N if M39048458N is divisible by 8 and 11

a. 6/ Cannot be determined, 4 b. 5, 5 c. 6, 6 d. 6, 5 **(Ans: a.)**

Solution: Divisibility of 8 – The last 3 digits of a number must be divisible by 8

58N is divisible by 8, N = 4.

Divisibility of 11 – The difference of the even and odd place must be zero

$(M + 9 + 4 + 4 + 8) - (3 + 0 + 8 + 5 + N) = 0$

$M + 25 - 16 - N = 0$; $M + 9 - 4 = 0$, For Divisibility of 11 the answer cannot be determined.

11. A number which divides 899 leaves the remainder 63. Find the remainder when it is divided by 29

a. 4 b. 5 c. 3 d. 2 **(Ans: b.)**

Solution: Let the number be X

Dividend = (Divisor × Quotient) + Remainder

$= (899 \times \text{Quotient}) + 63$

$= 899q + (29 \times 2) + 5$

$= (31 \times 29 \times q) + (29 \times 2) + 5$

Remainder = 5

12. A certain number when divided by 3 and 5 leaves the remainder 1 and 2. Find the remainder when the same number is divided by 15.

a. 6 b. 7 c. 5 d. 8 **(Ans: b.)**

Solution: Let x be the dividend.

$X = 3y + 1$ ---------- (i)

Now, Y become dividend for 5.

$Y = 5z + 2$ ---------- (ii)

Putting Y in (i)

$X = 3(5z + 2) + 1$

$= 15z + 6 + 1 = 15z + 7$

Therefore, when X is divided by 15 gives remainder 7

13. Sum of two numbers is 15 and sum of their squares is 113. Find the numbers

a. 9 and 6 b. 7 and 8 c. 10 and 5 d. 10 and 13 **(Ans: b.)**

Solution: let the numbers be X and Y

$X + Y = 15$ ..... 1.

$X^2 + Y^2 = 113$ ..... 2.

$(a + b)^2 = a^2 + 2ab + b^2$; $(15)^2 = 113 + 2ab$; $225 - 113 = 2ab$; $2ab = 112$; $ab = 112 / 2$;

Therefore, $ab = 56$ which is $7 * 8 = ab$. Hence, $a = 7$ and $b = 8$.

14. Difference of 2 numbers is 11 and one-fifth of their sum is 9. Find the numbers

a. 17 and 28 b. 28 and 17 c. 17 and 27 d. 27 and 17 **(Ans: b.)**

Solution: Let the numbers be X and Y

Given, $X - Y = 11$ ..... 1.

$1/5 (X + Y) = 9$ ..... 2.

Therefore, Add 1 and 2 $X - Y = 11$

$X + Y = 45$

$2X = 66$

Hence, $X = 66 / 2$; $X = 33$. Substitute X in 1.

$33 - Y = 11$; $Y = 33 - 11$; $Y = 22$.

Therefore, $X = 33$ and $Y = 22$.

15. When three numbers are added in pairs, the sums equal to 10, 19 and 21. Find the numbers.

a. 2, 4, 6 b. 6, 4, 15 c. 4, 6, 8 d. 6, 8, 10 **(Ans. B.)**

Solution: Let the numbers be A, B and C.

$A + B = 10$, $B + C = 19$, $C + A = 21$;

By adding all the pairs; $A + B = 10$

$B + C = 19$

$$\underline{C + A = 21}$$

$$\underline{2A + 2B + 2C = 50}$$

Hence, $2 (A + B + C) = 50$; $A + B + C = 50 / 2$; $A + B + C = 25$.

Substitute $A + B = 10$ in $A + B + C = 25$; $10 + C = 25$; $C = 15$

⇨ $C + A = 21$; $15 + A = 21$; $A = 21 - 15$; $A = 6$.

⇨ $A + B = 10$; $6 + B = 10$; $B = 10 - 6$; $B = 4$.

Hence, $A = 6$; $B = 4$ and $C = 15$.

Quantitative Aptitude:

Chapter 3: L.C.M and H.C.F.

1. Find HCF of 140 and 200

a. 15 b. 25 c. 20 d. 30 (Ans: c.)

Solution: H.C.F. => $140 = 10 \times 2 \times 7$

$=> 200 = 10 \times 2 \times 10$

H.C.F. = $10 \times 2 = 20$

2. Find HCF of 324, 630 and 342

a. 18 b. 25 c. 20 d. 30 (Ans: a.)

Solution: H.C.F. => $324 = 2 \times 3 \times 3 \times 18$

$=> 630 = 2 \times 3 \times 3 \times 35$

$=> 342 = 2 \times 3 \times 3 \times 19$

H.C.F. = $2 \times 3 \times 3 = 18$

3. Find the LCM of 12 and 20

a. 70 b. 80 c. 90 d. 60 (Ans: d.)

Solution: L.C.M = $12 = 4 \times 3 = 12$

$= 20 = 4 \times 5 = 20$

L.C.M. = $4 \times 3 \times 5 = 60$

4. Find LCM of 14, 56, 91 and 84

a. 15000 b. 15500 c. 15288 d. 15100 (Ans: c.)

Solution: L.C.M = $14 = 7 \times 2$

$= 56 = 7 \times 2 \times 2 \times 2$

$= 84 = 7 \times 2 \times 2 \times 3$

$= 91 = 91 \times 1$

L.C.M = $7 \times 2 \times 2 \times 2 \times 3 \times 91 \times 1 = 15{,}288$.

5. Find HCF and LCM of $4^1/_2$, 6/2 and $10^1/_2$ (Ans: $1^1/_2$, 63)

a. 2/3 & 61 b. 2/5 & 60 c. $1^1/_2$, 63 d. 1 & 60 (Ans: c.)

Solution: Therefore, the fraction is = $4^1/_2$ = 9/2, 6/2 & $10^1/_2$ = 21/2

$$\textbf{H.C.F} = \frac{\textbf{H.C.F of Numerator}}{\textbf{L.C.M of Denominator}} \quad \& \quad \textbf{L.C.M} = \frac{\textbf{L.C.M of Numerator}}{\textbf{H.C.F of Denominator}}$$

Numbers in Numerator = 9, 6 & 21; Denominator = 2, 2 & 2

H.C.F of Numerator = 9 = 3 × 3; 6 = 3 × 2 & 21 = 3 × 7

H.C.F = 3

L.C.M of Numerator = 9 = 3 × 3; 6 = 3 × 2 & 21 = 3 × 7

L.C.M = 3 × 3 × 2 × 7 = 126

H.C.F of Denominator = 2 = 2 × 1; 2 = 2 × 1 & 2 = 2 × 1

H.C.F = 2

L.C.M of Denominator = 2 = 2 × 1; 2 = 2 × 1 & 2 = 2 × 1

L.C.M = 2

H.C.F = 3 / 2 or $1^1/_2$ and L.C.M = 126 / 2 or 63

6. Find HCF and LCM of 0.6, 9.6, 0.36

a. 3/50 & 144/5 b. 3/24 & 143/5 c. 3/2 & 100/5 d. 3/2 & 1 (Ans: a.)

Solution: Therefore, the fraction is => 0.6 = 6/10, 9.6 = 96/10 and 0.36 = 36/100

$$\textbf{H.C.F} = \frac{\textbf{H.C.F of Numerator}}{\textbf{L.C.M of Denominator}} \quad \& \quad \textbf{L.C.M} = \frac{\textbf{L.C.M of Numerator}}{\textbf{H.C.F of Denominator}}$$

Numbers in Numerator = 6, 96 & 36; Denominator = 10, 10 & 100

H.C.F of Numerator = 6 = 6 × 1; 96 = 6 × 16 & 36 = 6 × 6

H.C.F = 6

L.C.M of Numerator = 6 = 6 × 1; 96 = 6 × 2 × 8 & 36 = 6 × 2 × 3

L.C.M = 6 × 2 × 8 × 3 = 288

H.C.F of Denominator = 10 = 10 × 1; 10 = 10 × 1 & 100 = 10 × 10

H.C.F = 10

L.C.M of Denominator = 10 = 10 × 1; 10 = 10 × 1 & 100 = 10 × 10

L.C.M = 10 × 10 = 100

H.C.F = 6/100 or 3/50 and L.C.M = 288/10 or 144/5

7. Find HCF and LCM of 2/3, 8/9, 16/81, 10/27

a. 2/81 & 80/3 b. 2/80 & 81/2 c. 2/50 & 80/3 d. 2/20 & 30/3 (Ans: a.)

Solution: Therefore, the fraction is => 2/3, 8/9, 16/81 and 10/27

$$\textbf{H.C.F} = \frac{\textbf{H.C.F of Numerator}}{\textbf{L.C.M of Denominator}} \quad \& \quad \textbf{L.C.M} = \frac{\textbf{L.C.M of Numerator}}{\textbf{H.C.F of Denominator}}$$

Numbers in Numerator = 2, 8, 16 & 10; Denominator = 3, 9, 81 & 27

H.C.F of Numerator = 2 = 2 × 1; 8 = 2 × 4, 16 = 2 × 8 & 10 = 2 × 5

H.C.F = 2

L.C.M of Numerator = 2 = 2 × 1; 8 = 2 × 2 × 2, 16 = 2 × 2 × 2 × 2 & 10 = 2 × 5

L.C.M = 2 × 2 × 2 × 2 × 5 = 80

H.C.F of Denominator = 3 = 3 × 1; 9 = 3 × 3, 81 = 3 × 27 & 27 = 3 × 9

H.C.F = 3

L.C.M of Denominator = 3 = 3 × 1; 9 = 3 × 3, 81 = 3 × 3 × 3 × 3 & 27 = 3 × 3 × 3

L.C.M = 3 × 3 × 3 × 3 = 81

H.C.F = 2/81 and L.C.M = 80/3

8. Two numbers are in the ratio 15:11. If their HCF is 13, find the numbers

a. 195 : 140 b. 195 : 143 c. 195 : 142 d. 195 : 140 (Ans: b.)

Solution: Let X be the number

The numbers = 15x : 14x

H.C.F = 13, Therefore, X = 13

Hence, $15 \times 13 : 11 \times 13$

$195 : 143$

9. Find the greatest possible length which can be used to measure exactly the length 4m 95cm, 9m and 16m 65cm

a. 45cm b. 40cm c. 42cm d. 35cm (Ans: a.)

Solution: 1 m – 100cm

4m 95cm – $(4 \times 100) + 95 = 495$cm

9m - $(9 \times 100) = 900$cm

16m 65cm – $(16 \times 100) + 65 = 1665$cm

H.C.F = $495 = 5 \times 3 \times 3 = 45$cm

10. Write the numbers ½, 2/3, 5/6, ¾ in ascending order

a. ½, 2/3, 5/6, 3/4 b. ½, 2/3, ¾, 5/6 c. ½, 2/3, 4/5, 1/5 (Ans: b.)

Solution: First equalise the denominator. As 6 is the highest number in the denominator therefore in denominator the numbers are 2, 3, 6 and 4 Hence 12 (6*2) is divisible by all the numbers in denominator.

$\therefore$ ½ = 6/12, 2/3 = 8/12, 5/6 = 10/12, and ¾ = 9/12

When converted to Ascending Order = 6/12, 8/12, 9/12 and 10/12

The numbers in Ascending Order = ½, 2/3, ¾ and 5/6

11. Find least number exactly divisible by 12, 15, 20 and 27.

a. 450 b. 500 c. 540 d. 600 (Ans: c.)

Solution: Here, we express the numbers as the product of prime factors

$12 = 2 \times 2 \times 4$

$15 = 3 \times 5$

$20 = 2 \times 2 \times 5$

$27 = 3 \times 3 \times 3$

LCM (12, 15, 20, 27) = $2 \times 2 \times 3 \times 3 \times 3 \times 5 = 540$

12. Find the largest number which divides the 256 and 480.

a. 30 b. 31 c. 32 d. 40 (Ans: c.)

Solution: The prime factorization of 256 & 480

$256 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$

$480 = 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 5$

To find the GCF, multiply all the prime factors common to both numbers:

Therefore, GCF $= 2 \times 2 \times 2 \times 2 \times 2 = 32$

13. Find the smallest and largest number of 3 digits which is exactly divisible by 16 and 24.

a. 145, 955 b. 144, 960 c. 144, 945 d. 140, 930 (Ans: b.)

Solution: The prime factorization of 16 & 24

$16 = 2 \times 2 \times 2 \times 2$

$24 = 2 \times 2 \times 2 \times 3$ L.C.M of 16 & 24 $= 2 \times 2 \times 2 \times 2 \times 3 = 48$

The smallest number is the multiples of $48 = 48 \times 3 = 144$

The Largest three-digit number is 999, when 999 is divided by 48 it leaves a remainder 39. Therefore, the largest 3-digit Number is $999 - 39 = 960$

14. Product of Two numbers is 300. Their LCM is 60. Find HCF.

a. 4 b. 5 c. 6 d. 7 (Ans: b)

Solution: Product of two numbers = H.C.F × L.C.M

$\therefore 300 = 60 \times$ H.C.F $\Rightarrow$ H.C.F $= 300 / 60 = 5$

15. HCF and LCM of two numbers are 3 and 60. One number is 12. Find the other number.

a. 15 b. 20 c. 25 d. 30 (Ans: a.)

Solution: Product of two numbers = H.C.F × L.C.M

$\therefore A \times 12 = 3 \times 60 \Rightarrow A = 180 / 12 \Rightarrow A = 15.$

Quantitative Aptitude:

Chapter 4: Squares and Square Roots

Number	Square Root	Number	Square Root
1	1.0000	11	3.317
2	1.414	12	3.464
3	1.732	13	3.606
4	2.0000	14	3.742
5	2.236	15	3.873
6	2.449	16	4.0000
7	2.646	17	4.123
8	2.828	18	4.243
9	3.0000	19	4.359
10	3.162	20	4.472

1. Find the square root of 196, 6084, 1521, 106276

a. 14, 78, 39 & 326 b. 13, 75, 38 & 325 c. 13, 74, 39 & 326 **(Ans: a.)**

Solution: $196 = 14^2$, $6084 = 78^2$, $1521 = 39^2$ & $106276 = 326^2$

2. Find the square root of 151

a. 12.2882 b. 12.5666 c. 13 d. 14 **(Ans: a)**

Solution: $\sqrt{151} = 12.2882$

3. Find the square root of 679

a. 26.0576 b. 28 c. 29 d. 30 **(Ans: a)**

Solution: $\sqrt{679} = 26.0576$

4. Find the square root of $\sqrt{2.56}$

a. 1.7 b. 1.8 c. 1.6 d. 2.0 **(Ans: c)**

Solution: $\sqrt{2.56} = \sqrt{\frac{256}{100}} = \sqrt{\frac{2\times2\times2\times2\times2\times2\times2\times2}{10\times10}} = \frac{2^4}{10} = 16/10$

$= 1.6$

5. Find the smallest number by which 396 must be multiplied so that product becomes a perfect square.

a. 8 b. 11 c. 6 d. 5 **(Ans: b.)**

Solution: The prime factorization of 396

$396 = (2\times2)\times(3\times3)\times 11$

As 11 is remaining, the least number to be multiplied is 11.

6. Find the smallest number by which 6300 be divided so that quotient is a perfect square

a. 7.5 b. 11 c. 7 d. 5 **(Ans: c.)**

Solution: The prime factorization of 6300

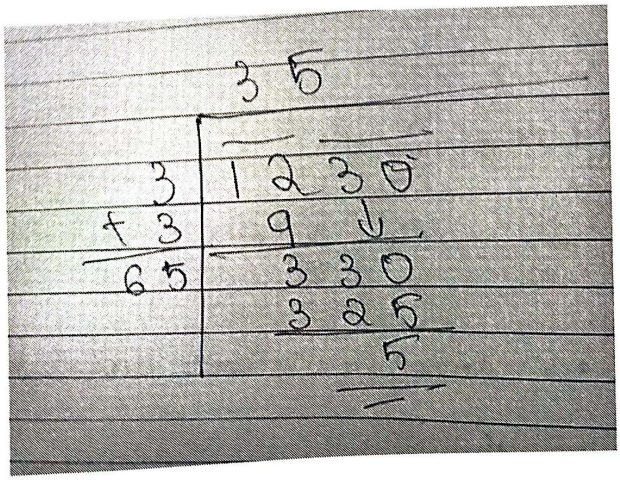
$6300 = (2\times2)\times(3\times3)\times(5\times5)\times 7$

As 7 is remaining, the smallest number that divides 6300 to get the quotient a perfect square is 7.

7. What is the number to be subtracted from 1230 to get a perfect square?

a. 4 b. 5 c. 6 d. **7 (Ans: b.)**

Solution:



Therefore, 5 is the number remaining hence 5 must be subtracted from 1230 to get a perfect square number.

8. $\sqrt{2}$ is _____

a. 1.41 b. 1.42 c. 1.43 d. 1.47 **(Ans: a.)**

9. $\sqrt{3}$ is _____(Upto 3 Decimal places).

a. 1.731 b. 1.732 c. 1.735 d. 1.723 **(Ans: b.)**

10. Find the least square number which is exactly divisible by 10, 12, 15 and 18.

a. 950 b. 900 c. 1000 d. 1150 **(Ans: b)**

Solution: The prime factorization of 10, 12, 15 and 18

$10 = 2 \times 1 \times 5$

$12 = 2 \times 3 \times 5 \times 2$

$15 = 1 \times 3 \times 5$

$18 = 2 \times 3 \times 1 \times 3$

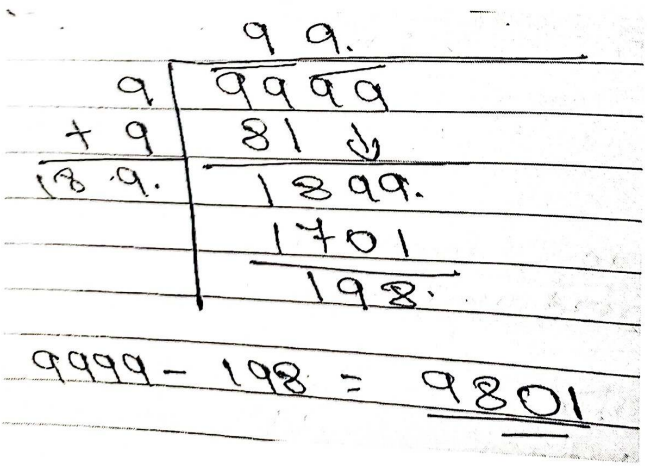
L.C.M. $= 2 \times 3 \times 5 \times 2 \times 3 = 180$

The multiples of 180 which is a perfect square is $180 \times 5 = 900$

11. Find the greatest number of four digits which is a perfect square

a. 9802 b. 9803 c. 9801 d. 9804 **(Ans: c.)**

Solution:



12. Find the smallest number that must be added to 1780 to make it a perfect square

a. 69 b. 70 c. 72 d. 80 **(Ans: a.)**

Solution: $\sqrt{1780} = 42.190$

Now, finding the square of the next number

$\Rightarrow 43^2 = 1849$

Required Number = (1849 – 1780) = 69

Therefore, the required smallest number is 69

13. Find the least number to be subtracted from 300 to make it perfect square.

a. 44 b. 45 c. 46 d. 47 **(Ans: a.)**

Solution: $\sqrt{300} = 17.3205$

Now, finding the square of the number before 17.

$\Rightarrow 16^2 = 256$

Required Number = (300 – 256) = 44

Therefore, the required smallest number is 44

14. Solve for x $\sqrt{\frac{36}{16}} = 2x$

a. ¾ b. 4/3 c. ½ d. 2/3 **(Ans: a.)**

Solution: $\sqrt{36} = 6$, $\sqrt{16} = 4$; $6/4 = 2x$

$$6 = 4 \times 2x \Rightarrow 6 = 8x \Rightarrow 6/8 = x \Rightarrow X = \frac{3}{4}$$

15. Simplify $\sqrt{\frac{0.0289}{0.000121}}$

a. 15 b. 16 c. 15.45455 d. None **(Ans: c. 15.45455)**

Solution: $\sqrt{\frac{0.0289}{0.000121} \times \frac{1000000}{1000000}} \Rightarrow \sqrt{\frac{28900}{121}}$

Square root of 28900 is 170 & 121 is 11

$\therefore$ The sum becomes $\frac{170}{11} = 15.45455.$

Chapter 5: Cube and Cube Roots

Number	Cube Root	Number	Cube Root
1	1.0000	20	2.714
2	1.26	30	3.107
3	1.442	40	3.420
4	1.587	50	3.684
5	1.710	60	3.915
6	1.817	70	4.121
7	1.913	80	4.309
8	2.0000	90	4.481
9	2.080	100	4.642
10	2.154		

1. Find cube root 343 and 2744

a. 7 and 14 b. 14 & 7 c. 8 & 13 d. 13 & 3 **(Ans: a.)**

Solution: $\sqrt[3]{343} = \sqrt[3]{(Number \times \text{Number} \times \text{Number})}$

$= \sqrt[3]{7 \times 7 \times 7} \Rightarrow 7$

$\sqrt[3]{2744} = \sqrt[3]{(Number \times \text{Number} \times \text{Number})}$

$= \sqrt[3]{7 \times 7 \times 7 \times 2 \times 2 \times 2} \Rightarrow 7 \times 2 = 14$

The number is 7 and 14

2. Find cube of 33

a. 35940 b. 35945 c. 35937 d. 35000 **(Ans: b. 35945)**

Solution: $(a + b)^3 = a^3 + b^3 + 3ab(a + b)$

We can write 33^3 as $(30 + 3)^3 = 30^3 + 3^3 + 3 \times 30 \times 3(30 + 3)$

$= 27000 + 27 + 270(33) = \underline{35937.}$

3. Find the cube root of 9261, 74088 and 658503

a. 21, 42 & 87 b. 21, 43 & 87 c. 0, 0 & 13 d. 1, 2 & 3 **(Ans: a.)**

Solution: $\sqrt[3]{9261} = \sqrt[3]{(Number \times Number \times Number)}$

$= \sqrt[3]{3 \times 3 \times 3 \times 7 \times 7 \times 7} \Rightarrow 3 \times 7 = 21$

$\sqrt[3]{74088} = \sqrt[3]{(Number \times Number \times Number)}$

$= \sqrt[3]{2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 7 \times 7 \times 7} \Rightarrow 2 \times 3 \times 7 = 42$

$\sqrt[3]{658503} = 87$

Since the unit digit of 658503 is 3, the unit digit of its cube root should be 7.

Now, consider the first three digits 658. We know that, $8^3 < 658 < 9^3$

So, the digit in the ten's place is 8.

Now, consider the Next three digits 503. We know that, $7^3 < 658 < 8^3$

So the digit in the ten's place is 7.

4. Find the cube root of 2.744

a. 1.5 b. 1.4 c. 1.3 d. 1.6 **(Ans: b.)**

Solution: $\sqrt[3]{2.744} = \sqrt[3]{2 \times 2 \times 2 \times 7 \times 7 \times 7} = 7 \times 2 = 14 = 1.4$

5. Find least number to be multiplied to 4320 to obtain a number which is a perfect cube.

a.10 b.30 c.20 d. 50 **(Ans: d.)**

Solution: The prime factorisation of 4320

$\Rightarrow 4320 = 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 5 \times 1$

We can now write in terms of power, we get $\Rightarrow 4320 = 2^5 \times 3^3 \times 5^1$

We know to get a cubic term; we should have all the terms in triplets.

Here we can see that, we need one 2 and two 5's, to get the triplet form, i.e. cubic form

$\Rightarrow 2 \times 5 \times 5 = 50$

We can now check, whether we get perfect cube if we multiply 50 to 4320,

$\Rightarrow 4320 \times 50 = 216000$

We can now apply cubic root, $\Rightarrow \sqrt[3]{216000} = 60$

The resulting value is a perfect cube, when 50 is multiplied to 4320.

6. Which of the following is a cube

a. 529 b. 1000 c. 625 d. 196 **(Ans: b.)**

7. Smallest number to be multiplied to 3600 to get a perfect cube is

a. 50 b. 60 c. 40 d. 100 **(Ans: b.)**

8. Simplify $\sqrt[3]{0.008} + \sqrt[3]{0.125}$ _____.

a. 0.60 b. 0.70 c. 0.80 d. 0.90 **(Ans: b.)**

Solution: $\sqrt[3]{\frac{8}{1000}} + \sqrt[3]{\frac{125}{1000}}$

$= \frac{2}{10} + \frac{5}{10} \Rightarrow \mathbf{0.2 + 0.5 = 0.70}$

9. Simplify $\sqrt[3]{0.000125}$ _____.

a. 0.04 b. 0.05 c. 0.06 d. 0.07 **(Ans: b.)**

Solution: $\sqrt[3]{\frac{125}{1000000}} \Rightarrow \frac{5}{100} \Rightarrow \mathbf{0.05}$

10. Simplify $\sqrt[3]{0.000000064}$ _____.

a. 0.005 b. 0.006 c. 0.004 d. 0.007 **(Ans: c.)**

Solution: $\sqrt[3]{\frac{64}{1000000000}} \Rightarrow \frac{4}{1000} \Rightarrow 0.004$

11. Simplify $\sqrt[3]{\frac{0.008}{0.001}}$ is _____.

a. 4 b. -2 c. 2 d. 1 **(Ans: 2)**

Solution: Cube root of 0.008 is 0.2 & 0.001 is 0.1

$\sqrt[3]{\frac{0.008}{0.001}} \times \frac{1000}{1000} \Rightarrow \sqrt[3]{\frac{8}{1}} \Rightarrow 2 / 1 \Rightarrow 2$

12. $\sqrt[3]{27} + \sqrt[3]{0.027} + \sqrt[3]{0.000027}$ is _____.

a. 3 b. 3.3 c. 3.33 d. 3.303 **(Ans: c)**

Solution: $\sqrt[3]{27} + \sqrt[3]{0.027} + \sqrt[3]{0.000027} \Rightarrow 3 + \sqrt[3]{\frac{27}{1000}} + \sqrt[3]{\frac{27}{1000000}}$

$= 3 + \frac{3}{10} + \frac{3}{100} \Rightarrow 3 + 0.3 + 0.03 \Rightarrow 3.33.$

13. Which of the following is not a cube

a. 216 b. 256 c. 343 d. 729 **(Ans: b.)**

Solution: a. $216 = 6^3$, c. $343 = 7^3$, d. $729 = 9^3$, b. $256 = 16^2$ is 256

14. Solve the Equation $x^3 + 8 = 0$

a. -2 b. 2 c. 3 d. -3 **(Ans: b. 2)**

Solution: $X^3 = -8$, $X = \sqrt[3]{8}$, $X = 2$.

15. A cube root of -512 is _____.

a. 8 b. 9 c. 4 d. – 8 **(d. – 8)**

Quantitative Aptitude

Chapter 6: Surds and Indices

1. $a^m \times a^n = a^{m+n}$	2. $a^m / a^n = a^{m-n}$
3. $(a^m)^n = a^{m \times n}$	4. $\sqrt[m]{\sqrt[n]{a}} = \sqrt[m \times n]{a}$

1. Simplify: $1000^7 \times 10^5$

a. 10^{25} b. 10^{26} c. 10^{24} d. 10^{23} **(Ans: b.)**

Solution: $1000^7 \times 10^5 \Rightarrow (10^3)^7 \times 10^5 \Rightarrow 10^{21} \times 10^5$

$10^{21+5} \Rightarrow \underline{\underline{10^{26}}}$

2. Simplify: $5^{25} \div 125^8$

a. 4 b. 25 c. 5 d. 6 **(Ans: c.)**

Solution: $5^{25} \div (5^3)^8 \Rightarrow 5^{25} \div 5^{24} \Rightarrow 5^{25-24} = 5^1$ or 5

3. Simplify: $\sqrt[4]{3x+1} = 2$, find x

a. 5 b. 6 c. 7 d. 8 **(Ans: a.)**

Solution: $3x + 1 = 2^4 \Rightarrow 3x + 1 = 16 \Rightarrow x = 16 - 1 \div 3$

$X = 15 \div 3 = 5$

4. Simplify $((\sqrt{2})^3)^4$ _____.

a. 84 b. 46 c. 64 d. 90 **(Ans: c.)**

Solution: $2^{1/2 \times 3 \times 4} = 2^6 = 64$.

5. Simplify $((\sqrt{64})^3)^2$ _____.

a. 8^6 b. 8 c. 7 d. 8^3 **(Ans: a.)**

Solution: $\sqrt{64} = 8 \Rightarrow ((8)^3)^2 \Rightarrow 8^6$

6. Simplify $\sqrt[2]{\sqrt[3]{27}}$

a. $(27)^{1/6}$ b. $(27)^{1/3}$ c. $(27)^{1/4}$ d. $(27)^{1/5}$ **(Ans: a.)**

Solution: $\sqrt[2]{\sqrt[3]{27}} \Rightarrow \sqrt[6]{27} \Rightarrow (27)^{1/6}$

7. Simplify $((3)^2)^3 \div (\sqrt{3})^4$

a. 74 b. 81 c. 64 d. 25 **(Ans: c.)**

Solution: $(3)^6 \div (3)^{1/2 \times 4} \Rightarrow 729 \div 9 \Rightarrow 81.$

8. Simplify $\sqrt[3]{\sqrt[4]{5}}$ _____.

a. $5^{1/12}$ **b.** $5^{1/11}$ **c.** $5^{1/10}$ **d.** $5^{1/09}$ **(Ans: a.)**

Solution: $\sqrt[3]{\sqrt[4]{5}} = \sqrt[12]{5} = 5^{1/12}$

9. Simplify $(\sqrt[3]{27})^2 + (\sqrt[3]{64})^2 + \sqrt[3]{\frac{125}{64}}$

a. 102 / 4 b. 103 / 4 c. 102 / 4 d. 105 / 4 **(Ans: d.)**

Solution: $(3)^2 + (4)^2 + (5/4) \Rightarrow 9 + 16 + 5/4 \Rightarrow 25 + 5/4$

$= \frac{100+5}{4} \Rightarrow 105 / 4.$

10. Express $\sqrt[4]{2} \times \sqrt[3]{3} \times \sqrt[5]{4}$ as surds of same orders

a. $\sqrt[60]{2^{15}} \times \sqrt[60]{3^{20}} \times \sqrt[60]{4^{12}}$ b. $\sqrt[60]{2^{12}} \times \sqrt[60]{3^{20}} \times \sqrt[60]{4^{12}}$

c. $\sqrt[60]{2^{15}} \times \sqrt[60]{3^{19}} \times \sqrt[60]{4^{12}}$ **(Ans: a.)**

Solution: L.C.M $= 4 \times 3 \times 5 = 60 \Rightarrow 2^{15/60} \times 3^{20/60} \times 4^{12/60}$

$= \sqrt[60]{2^{15}} \times \sqrt[60]{3^{20}} \times \sqrt[60]{4^{12}}$

11. Find x if $(\sqrt{0.0009})^3 = x$

a. 0.000027 b. 0.000036 c. 0.000025 **(Ans: a.)**

Solution: $\sqrt{0.0009} = 0.03 \Rightarrow (0.03)^3 \Rightarrow 0.000027$

12. Find x if $\sqrt{\frac{32.4}{x}} = \sqrt[3]{8}$

a. 8.1 b. 8.2 c. 8.3 d. 8.5 **(Ans: a.)**

Solution: $\sqrt{\frac{32.4}{x}} = 2 \Rightarrow 32.4/x = 2^2 \Rightarrow 32.4 = 4 \times x$

$= 32.4 / 4 = x \Rightarrow x = 8.1.$

13. Evaluate $\sqrt{248 + \sqrt{51 + \sqrt{169}}}$

a. 25 b. 16 c. 36 d. 49 **(Ans: b.)**

Solution: $\sqrt{248 + \sqrt{51 + 13}} = \sqrt{248 + \sqrt{64}}$

$\sqrt{248 + 8} = \sqrt{256} = 16.$

14. Find x if $2^x \times 2^{x-1} = 32$

a. 3 b. 4 c. 5 d. 6 **(Ans: a.)**

Solution: $2^x \times 2^{x-1} = 2^5 \Rightarrow 2^{x+x-1} = 2^5 \Rightarrow x + x - 1 = 5$

$2x = 5 + 1 \Rightarrow x = 6/2 \Rightarrow x = 3$

15. Find the value of $\frac{2^{10} \times 3^5 \times 5^2}{25 \times 243 \times 512}$

a. 2 b. 3 c. 7 d. 8 **(Ans: a.)**

Solution: $\frac{2^{10} \times 3^5 \times 5^2}{25 \times 243 \times 512} = \frac{2^{10} \times 3^5 \times 5^2}{5^2 \times 3^5 \times 2^9} = 2^{10-9} \times 3^{5-5} \times 5^{2-2}$

$= 2^1$ or 2

Quantitative Aptitude

Chapter 7: Clock And Calendar Problems

1. 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?

a. 144° b. 150° c. 168° d. 180° **(Ans: d.)**

Solution: Angle traced by the hour hand in 6 hours =360°/12 x 6 hours=180°

2. The angle between the minute hand and the hour hand of a clock when the time is 4.20, is:

a. 0° b. 10° c. 5° d. 20° **(Ans b)**

Solution: Angle = 30°H - 5.5°M

= (30°x4) - (5.5°x20).

= 120°-110°.

= 10 °

(Since the minute hand gains 6° in a minute and the hour hand gains 0.5° in a minute and ultimately the minute hand gains 5.5° (i.e. 6°-0.5°) over hour hand in a minute)

3. At what time between 5 & 6 will the hands of a clock coincide

a. $27\,^{3}/_{11}$ min past 5 b. 26 min past 5

c. $27^{6}/$ min past 5 d. 27 min past 5 **(Ans a.)**

Solution: At 5 O' clock the hands are 25 minutes apart. Clearly the minute hand must gain 25 minutes over hour hand to be coincident. But the minute hand gains 55 minutes in 60 minutes over hour hand.

Let us assume that minute hand gains 25 minutes in x minutes

Then, $55/25 = 60/x$: X = 25×60/55 = 30011 = $27\,^{3}/_{11}$

(The minute hand moves 60 min divisions in an hour and the hour hand moves 5 min divisions in an hour. Hence the minute hand gains 55 minutes (i.e. 60-5) in an hour over the hour hand)

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

a. 45 min. past 4 b. 40 min. past 4

c. $50^{4}/_{11}$ min. past 4 d. $54^{6}/_{11}$ min. past 4 **(Ans: d.)**

Solution: At 4 o'clock, the hands of the watch are 20 min. spaces apart. To be in opposite directions, they must be 30 min. spaces apart. Minute hand will have to gain 50 min. spaces. (20+30)

55 min. spaces are gained in 60 min.

Let us assume that minute hand gains 50 min. spaces in x minutes

Then $55/50 = 60/x$

$X = 50\times60/55 = 600/11 = 54^{6}/_{11}$: i.e. $54^{6}/_{11}$ min. past 4

5. How many times do the hands of a clock coincide in a day?

a. 20 b. 21 c. 22 d. 24 **(Ans: c.)**

Solution: The hands of a clock coincide 11 times in every 12 hours (Since between 11 and 1, they coincide only once, i.e., at 12 o'clock). So, 22 times a day.

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

a. 40 min. past 5 b. 45 min. past 5

c. $43^{5}/_{11}$ min. past 5 d. $43^{7}/_{11}$ min. past 5 **(Ans: d.)**

Solution: At 5 o'clock, the hands are 25 min. spaces apart.

To be at right angles and that too between 5.30 and 6, the minute hand has to gain (25 + 15) = 40 min. spaces. 55 min. spaces are gained in 60 min.

Let us assume that minute hand gains 40 min. spaces in x minutes

Then $55/40 = 60/x$

$X = 40\times60/55 = 480/11 = 43^{7}/_{11}$ i.e. $43^{7}/_{11}$ min. past 5 (Ans d)

7. Which of the following is a leap year?

a. 1998 b.2002 c. 2004 d. 2014 **(Ans d)**

Solution: 2004 is a leap year because it is completely divisible by 4

8. If Vivekananda Jayanthi in 2018 was on Friday, then Vivekananda Jayanthi in 2019 and 2024 falls on

a. Saturday, Friday b. Sunday, Friday c. Thursday, Saturday

d. Saturday, Thursday **(Ans a)**

Solution: 2018 is a general year and a general year consists of 365 days (52 complete weeks and 1 odd day)

January 1st 2018= Friday

January 1st 2019 = Saturday, 2020: Sunday,2021: Tuesday,2022: Wed,2023: Thru.2024: Friday

9. What was the day of the week on 15th Aug 1947?

a. Thursday b. Friday c. Saturday d. Sunday **(Ans b)**

Solution: 28 May, 2006 = (1946 years + Period from 1.1.1947 to 15.08.1947)

1946=1600+300+46

Odd days in 1600 years = 0

Odd days in 300 years = 1

46 years = (35 ordinary years + 11 leap year) = (35 x 1 + 11 x 2) 57 odd days

Jan. to Aug 15^{th} (31 + 28 + 31 + 30 + 31 +30+31=15) = 227 days

Total odd days =1+57+227=285

285 days = (40 weeks + 5 day) 5 odd days.

Given day is Friday.

10. Today is Sunday. After 65 days it will be:

a. Sunday b. Monday c. Tuesday d. Wednesday **(Ans c.)**

Solution: Each day of the week is repeated after 7 days.

So, after 63 days, it will be Sunday.

After 65 days, it will be Tuesday.

(65÷7= 9 complete weeks and 2 odd days)

11. If 6th April 2023 falls on Thursday, then day the of the week falls on 11th Dec 2023 is

a. Monday b. Tuesday c. Wednesday d. Friday **(Ans: a.)**

Solution: April, May, June, July, Aug, Sep, Oct, Nov and Dec

(24+31+30+31+31+30+31+30+11) = 249 days

There are 249 days. If 249 is divided by 7 we get 35 complete weeks and 4 odd days.

So, December 11th 2023= Thursday+ 4 days = Monday

12. What was the day of the week on 17th June, 1998?

a. Monday b. Tuesday c. Wednesday d. Thursday **(Ans c.)**

Solution: 17th June, 1998 = (1997 years + Period from 1.1.1998 to 17.6.1998)

Odd days in 1600 years = 0; Odd days in 300 years = (5 x 3) 1

97 years has 24 leap years + 73 ordinary years.

Number of odd days in 97 years (24 x 2 + 73) = 121 = 2 odd days.

Jan. Feb. March April May June (31 + 28 + 31 + 30 + 31 + 17) = 168 days

168 days = 24 weeks = 0 odd day.

Total number of odd days = (0 + 1 + 2 + 0) = 3. Given day is Wednesday.

13. On what dates of April, 2001 did Wednesday fall?

a. 1st, 8th, 15th, 22nd, 29^{th} b. 2nd, 9th, 16th, 23rd, 30th

c. 3rd, 10th, 17th, 24^{th} d. 4th, 11th, 18th, 25^{th} **(Ans d)**

Solution: We shall find the day on 1st April, 2001.

1st April, 2001 = (2000 years + Period from 1.1.2001 to 1.4.2001)

Odd days in 1600 years = 0: Odd days in 400 years = 0

Jan. Feb. March April = (31 + 28 + 31 + 1) = 91 days 0 odd days.

Total number of odd days = (0 + 0 + 0) = 0

On 1st April, 2001 it was Sunday.

In April, 2001 Wednesday falls on 4th, 11th, 18th and 25th

14. For Certain month, the dates of three Sundays are even numbers. What day is 15th of that month?

a. Thursday. b. Friday c. Saturday d. Sunday **(Ans C)**

Solution: The only Possible dates with 3 even numbers are 2,9,16,23,30. So 16th is Sunday, 15th Saturday)

15. Calendar for which Pairs of year are same in the following?

a. 2001 and 2008 b. 2002 and 2008

c. 2003 and 2010 d. 2004 and 2011 **(Ans b)**

Quantitative Aptitude

Chapter 8: Algebra

1. If $7x - 5 = 4x + 11$ then x is

a. 3/16 b. $5\frac{1}{2}$ c. $5\frac{1}{3}$ d. $\frac{16}{11}$ **(Ans: c.)**

Solution: $7x - 5 = 4x + 11$

$7x - 4x = 5 + 11;\ x = \frac{16}{3} = 5\frac{1}{3}$

Go by options:

a. X=3/16, $7 \times \frac{3}{16} - 5 \neq 4 \times \frac{3}{16} + 11$

b. X=5.5, $7 \times 5.5 - 5 \neq 4 \times 5.5 + 11$

c. X=$5\frac{1}{3} = \frac{16}{3}$, $7 \times \frac{16}{3} - 5 \neq 4 \times \frac{16}{3} + 11$

2. If $\frac{4}{x} - \frac{3}{2x} = 5$ then x is

a. 2 b. $\frac{1}{2}$ c. 20 d. 50 **(Ans: b. ½)**

Solution: $\frac{4}{x} - \frac{3}{2x} = 5$

$\frac{8-3}{2x} = 5;\ 5 = 10x;\ x = 1/2$

Go by options

a. X=2, $\frac{4}{2} - \frac{3}{2\times2} = 2 - \frac{3}{4} \neq 5$

b. X=1/2, $\frac{4}{1/2} - \frac{3}{2\times\frac{1}{2}} = 8 - 3 = 5$

3. Sum of digits of two-digit number is 16. If the number formed by reversing the digits is less than the original number by 18. The original number is

a. 79 b. 88 c. 97 d. None **(Ans: c.)**

Solution: Let the number be $10x + y$.

Sum of the digits is $x + y = 16$.------- 1

After reversing digits, the difference between number formed by reversing the digits and original is 18.

$10y + x - 10x - y = 18$

$9y - 9x = 18$ or $x - y = -2$ ---------2

After solving these two equations, x=7 and y=9. The number is 79.

Easy method: Go by options; a. 79, sum of digits = 7+9=16 & 97-79 =18.

4. Solve for x and y, if $4x + 3y = 25$, $x + 5y = 19$

a. (3, 4) b. (4, 3) c. (2, 1) d. (9, 2) **(Ans: b.)**

Solution: $4x + 3y = 25$ ---------1

$x + 5y = 19$ --------- 2

Multiply equation 2 by 4 and subtract it from the equation 1

$4x + 3y = 25$

(-) $4x + 20y = 76$

After solving, $-17y=-51$ and $x=4$ & $y=3$

Easy method: Go by options

a. $X=3, y=4, 4(3) + 3(4) \neq 25$

b. $X=4, y=3, 4(4) + 3(3) = 25$ & $4+5(3) =19$

5. What is the value of k if the system $6x - 2y = 3$, $kx - y = 2$ has a unique solution?

a. 3 b. 2 c. 1/3 d. -3 **(Ans: a.)**

6. What is the value of k if the equations $3x + 5y = 10$, $kx + 10y = 20$ has infinitely many solutions?

a. 6 b. 2 c. 9 d. 12 **(Ans: a.)**

Solution: $3x + 5y = 10, kx + 10y = 20$

$a_1 = 3, b_1 = 5, c_1 = -10$ & $a_2 = k, b_2 = 10, c_2 = -20$

If $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$ then system of equations has infinitely many solutions.

$\frac{3}{k} = \frac{5}{10} = \frac{-10}{-20} \Rightarrow \frac{3}{k} = \frac{1}{2}$ & k=6.

7. Which of the following is a quadratic equation:

a. $x^3 + 2x + 3 = 0$ b. $(x - 1)(x + 4) = x^2 + 1$

c. $x^4 - 3x + 5 = 0$ d. $(2x - 1)(3x - 4) = 2x^2+3$ **(Ans: d.)**

Solution: The general format of quadratic equation is $ax^2+bx+c=0$.

Options 'a' & 'b' are cubic equations.

Expand the terms of option 'c', we get $x^2+ 4x - x - 4 = x^2+1$

$3x=5$ which is not a quadratic equation.

So, Answer is 'd'.

8. Solve $x - \frac{1}{x} = 1\frac{1}{2}$; then x is

a. 2 b. ½ c. x = 3 d. x = 5 **(Ans: a. 2)**

Solution: $x - \frac{1}{x} = 1\frac{1}{2} \Rightarrow \frac{x^2-1}{x} = \frac{3}{2}$

$2x^2 - 2 = 3x$ or $2x^2 - 3x - 2 = 0$.

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

$x = 2 \text{ or } -1/2$

Easy method: Go by options: a. 2 - 1/2 = $1\frac{1}{2}$

9. Which of the following equations has real roots?

a. $3x^2 + 4x + 5 = 0$ b. $x^2 + x + 4 = 0$

c. $(x - 1)(2x - 5) = 0$ d. $2x^2 - 3x + 4 = 0$ **(Ans: c.)**

Solution: The condition for real roots is $b^2 - 4ac \geq 0$.

Verify each option.

a. $b^2 - 4ac = 4^2 - 4 \times 3 \times 5 < 0$

b. $b^2 - 4ac = 1^2 - 4 \times 4 \times 1 < 0$

c. $b^2 - 4ac = 7^2 - 4 \times 2 \times 5 > 0$

10. Write a quadratic equation whose roots are 1 and 2

a. $x^2 - 3x + 2 = 0$ b. $(x^2 + 3x - 2) = 0$

c. $x^2 - 5x + 2 = 0$ d. $x^2 + 5x - 2 = 0$ **(Ans: a.)**

Solution: Roots are 1 & 2, quadratic equation is

$x^2 - (sum\ of\ roots)\ x\ Product\ of\ roots = 0.$

$x^2 - (1 + 2)x + (1 \times 2) = 0$

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

11. Sum of roots of a quadratic equation is 7, product is 12. Find the quadratic equation.

a. $x^2 - 6x + 5 = 0$ b. $x^2 - 7x + 12 = 0$

c. $x^2 + 7x - 12 = 0$ d. $x^2 - 12x + 7 = 0$ **(Ans: b.)**

Solution: Quadratic equation is $x^2 - (sum\ of\ roots)x + Product\ of\ roots = 0$

$x^2 - 7x + 12 = 0$

Easy method: Go by options. Verify the sum of roots and product of roots.

Sum of the roots = $\frac{-b}{a}$ and Product of roots = $\frac{c}{a}$

a. Sum of the roots = $\frac{-(-6)}{1} = 6$ and Product of roots = $\frac{5}{1} = 5$

b. Sum of the roots = $\frac{-(-7)}{1} = 7$ and Product of roots = $\frac{12}{1} = 12$

12. Write an algebraic equation satisfying salaries of Praveen and Pradeep. If Pradeep salary (x) is 10 less than 3 times Praveen's salary (y)

a. $y = 3x - 10$ b. $3x + 3y = 10$
c. $x + y = 10$ d. $x = 3y - 10$ **(Ans: d.)**

Solution: Praveen's salary =y

3 times Praveen's salary = 3y

Pradeep's salary = $x = 3y - 10$

13. If Bhavya's age is 5 more than 2/3rd of Kavya's age and Kavya's age is x, then three times Bhavya's age is,

a. $2x + 15$ b. $\frac{2x}{3} + 5$ c. $\frac{2x}{3} - 5$ d. $2x + 5$ **(Ans: a.)**

Solution: Kavya's age is x

Bhavya's age = 5 more than 2/3rd of Kavya's age $= 5 + \frac{2}{3}x$

14. A fraction becomes 2/3 if 1 is added to both its numerator and denominator. It becomes ½ if 1 is subtracted from numerator and denominator, the number is

a. 5/3 b. 3/5 c. ½ d. ¾ **(Ans: b.)**

Solution: Let the fraction be x/y.

If 1 is added to both numerator and denominator, $\frac{x+1}{y+1} = 2/3$

Simplify the above equation, $3x + 3 = 2y + 2$ or $3x - 2y = -1$ --(1)

If 1 is subtracted from both numerator and denominator, $\frac{x-1}{y-1} = 1/2$

15. Sum of 2 numbers is 16, Difference is 6. Find the numbers

a. 10 and 6 b. 9 and 7 c. 11 and 5 d. 13 and 7 **(Ans: c.)**

Solution: Let the two numbers be x and y.

Sum of 2 numbers $x + y = 16$,

Difference $x - y = 6$

Solving above two equations, $x = 11, y = 5$.

Easy method: Go by options,

a. 10 and 6-----10+6=16 but $10 - 6 \neq 6$.

b. 9 and 7------ 9+7=16 but $9 - 7 \neq 6$

c. 11 and 5-------11+5=16 and 11-5=6.

16. If one root of $kx^2 - 2x + 3 = 0$ is 2, then the value of k is

a. $\frac{1}{2}$ b. $\frac{1}{3}$ c. $\frac{1}{4}$ d. $\frac{1}{5}$ **(Ans: c.)**

Solution: $kx^2 - 2x + 3 = 0$ and x=2 then,

$k(2)^2 - 2(2) + 3 = 0$ & k=1/4

17. Find the sum and product of the roots of the equation $2x^2 - 5x + 2 = 0$

a. $\frac{3}{4}, 2$ b. $\frac{1}{4}, -2$ c. $\frac{5}{2}, 1$ d. $\frac{2}{3}, -1$ **(Ans: c.)**

Solution: $2x^2 - 5x + 2 = 0$ where $a = 2, b = -5$ & $c = 2$

Sum of the roots $= \frac{-b}{a} = \frac{5}{2}$

Product of the roots $= \frac{c}{a} = \frac{2}{2} = 1$

18. The system of equations $2x + 5y = 7$ & $8x + ky = 28$ has infinite number of solutions, when

a. $k = 20$ b. $k = -20$ c. $k = 10$ d. $k = -10$ **(Ans: a.)**

Solution: $2x + 5y = 7$ & $8x + ky = 28$

Where $a_1 = 2, b_1 = 5, c_1 = -7$ & $a_2 = 8, b_2 = k, c_2 = -28$

If $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$ then system of equations has infinitely many solutions.

$\frac{2}{8} = \frac{5}{k} = \frac{-7}{-28}$; $\frac{1}{4} = \frac{5}{k}$ & k=20

19. The system of equations $kx + 3y = 7$ & $6x + 2y = 11$ has a unique solution, when

a. $k = 0$ b. $k \neq 0$ c. $k = 9$ d. $k \neq 9$ **(Ans: d.)**

Solution: $kx + 3y = 7$ & $6x + 2y = 11$

Where $a_1 = k, b_1 = 3, c_1 = -7$ & $a_2 = 6, b_2 = 2, c_2 = -11$

If $\frac{a_1}{a_2} \neq \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$ then system of equations has unique solutions.

$\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$

$\frac{k}{6} \neq \frac{3}{2}$ & $k \neq 9$

20. Find x, if $3x - \frac{x}{2} = 25$

a. 10 b. 6 c. 3 d. 9 (Ans: a.)

Solution: 3x – x / 2 = 25

(6x - x) / 2 = 25

5x = 50 & x = 0

Easy method: Go by options

a. X=10, => 3 (10) – 10 / 2 = 30 – 5 = 25

Quantitative Aptitude

Chapter 9: Percentage

1. Express the fraction 11/12 into the percent

a. 90% b. $91^2/_3$ % c. 99% d. $91\frac{4}{3}$ % **(Ans: b. $91^2/_3$ %)**

Solution: $\frac{11}{12} \times 100 \Rightarrow 91\frac{2}{3}\%$

2. Rent of the house is increased from Rs 7000 to Rs. 7700. Express the increase in price as a percentage of the original rent.

a. 7% b. 17% c. 20% d. 10% **(Ans: d. 10%).**

Solution: Increase in Rent = 7700 – 7000 = Rs. 700.

Percentage = Changes in Rent / Original Rent × 100

= 700 / 7000 × 100

= 10%

3. The cost of a bike last year was Rs 19000. Its cost this year is Rs 17000. Find the percentage decrease in its cost.

a. 10% b. 10.5% c. 20% d. 10% **(Ans: b. 10.5%)**

Solution: Change in Price = 19000 – 17000 = Rs. 2000.

Percentage = 2000 / 19000 × 100 = 10.5 %

4. Two numbers are respectively 20% and 25% of a third number. What percentage is 1st of the second?

a. 20% b. 80% c. 50% d. 45% **(Ans: b.)**

Solution: Let the third number be Rs. 100

Then the First Number is 20 and Second Number 25.

Therefore, the percentage is = 20 / 25 × 100 = 80%

5. A positive number is divided by 5 instead of being multiplied by 5. By what percent is the result of the required correct value?

a. 40% b. 50% c. 4% d. 5% **(Ans: c.)**

Solution: Let the no be 100.

We were to multiply it by 5.

So, the result we would have got is 100*5=500

But we divided instead so our result is 100/5=20.

The Actual Result Would be 500 and the Result We Got is 20.

So, the result is (20÷500) × 100% = 4% of the Correct Value.

6. Find X when 5% of X is 1000.

a. 200 b. 50 c. 2000 d. 20000 **(Ans: d.)**

Solution: $X \times \frac{5}{100} = 1000$

$X = \frac{1000 \times 100}{5} \Rightarrow X = 20{,}000.$

7. 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?

a. 45% b. $45\frac{5}{11}\%$ c. $54\frac{6}{11}\%$ d. 55% **(Ans: b.)**

Solution: Total runs scored by boundaries and sixes is = ((3 × 4) + (8 × 6)) = 60.

Therefore, runs scored excluding boundaries and sixes is = 110 – 60 = 50

Percentage = 50 / 110 × 100 = $45\frac{5}{11}\%$

8. 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:

a. 39, 30 b. 41, 32 c. 42, 33 d. 43, 34 **(Ans: c.)**

Solution: Let the numbers be X + 9 and X

Therefore, x + 9 = 56 / 100 (x + x + 9)

225 – 126 = 28x – 25x

X = 33

Marks will be x + 9 = 33 + 9 = 42 & x = 33

9. The price of a commodity first fell by 25% and then rose by $33^1/_3\%$. Increase in price compared to the original price?

a. $8^1/_3\%$ b. 0% c. $29^1/_6\%$ d. $33^1/_3\%$ **(Ans: b.)**

Solution: Let the price of the commodity be 100

When the price fell = 100 – (25% of 100) = 75

When the price increased = 75 + ($33^1/_3\%$ of 75) = 100

Percentage = Change / Original × 100

= (100 – 100) / 100 × 100 = 0%

10. Fruit seller had some apples. He sells 40% apples and still has 420 apples. Originally, he had:

a. 588 apples b. 600 apples c. 672 apples d. 700 apples **(Ans: d.)**

Solution: Remaining apples = 60%

Therefore, 60/100 of X = 420

X = 420 × 100 / 60

X = 700 apples.

11. 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:

a. 2700 b. 2900 c. 3000 d. 3100 **(Ans: a)**

Solution: Number of valid votes = (100 – 20) % of 7500 = 6000

Therefore, the valid votes taken by one candidate = 6000 × 55% = 3300

The votes taken by another candidate = 6000 – 3300 = 2700.

The votes taken by 2nd candidate is 2700 votes.

12. If the radius of a circle increased by 20% then the corresponding increase in the area of circle is

a. 40% b. 44% c. 20% d. 21% **(Ans: b.)**

Solution: Let the radius of original circle be 100

Area = πr^2

Area of original Circle = $\pi (100)^2 \Rightarrow \pi 10000$

When the radius is increased by 20% = Then r = 100 + 20% of 100

New Area = $\pi (120)^2 \Rightarrow \pi 14400$

Percentage = $(10000\pi - 14400\pi) / 10000\pi \times 100$

$= 4400\pi / 10000\pi \times 100$

$= 44\%$

13. A man gives 40% of his money to his children and 20% of the remaining to a trust. If he is still left with Rs. 9600, then what did he originally have?

a. 19845 b. 14000 c. 20000 d. 25400 **(Ans: c.)**

Solution: Let X be the money he had

The money given to children = X × 40% = 0.4X

The money given to trust is = (X – 0.4X) × 20/100 = 0.12X

The money left by him = 9600 = X – 0.4X – 0.12X

= 9600 = 0.48X

X = 9600 / 0.48 = 20000

14. Three candidates contested an election and received 1136, 7636 and 11628 votes respectively. What percentage of the total votes did the winning candidate get?

a. 57% b. 60% c. 65% d. 90% **(Ans: a.)**

Solution: Total number of votes = (1136 + 7636 + 11628) = 20400

Percentage = 11628 / 20400 × 100

= 57%

15. The population of a town increased from 175000 to 262500 in a decade. The average percent increase of population per year is:

a. 4.37% b. 5% c. 6% d. 8.75% (Ans: b.)

Solution: 1 Decade = 10 years.

Increase in 10 years = (262500 – 175000) = 87500

Percentage = 87500 / 175000 × 100 = 50%

Percentage increase per year = 50 / 10 = 5%

Quantitative Aptitude

Chapter 10: Profit and Loss

1. A shopkeeper made a profit of 20% on an article which is sold for Rs. 2400. The cost price of the article is

a. 2000 b. 2200 c. 2600 d. 2800 **(Ans: a.)**

Solution: Let the cost price of the article be Rs.100

The profit is 20% on Cost price – Rs. 20

The selling price is – Rs.100 + Rs.20 = Rs.120

C.P.		S.P.
Rs. 100	×	Rs. 120
?		Rs. 2400

C.P. = 100 × 2400 / 120 = Rs. 2000

2. An article was brought for Rs. 2000 and sold for Rs. 2200. Gain or loss percent is

a. 10 b. 5 c. 15 d. 20 **(Ans: a.)**

Solution: Profit or Loss percentage = Profit or Loss / Cost price × 100

Profit Percentage = (2200 – 2000) / 2000 × 100 = 10%

3. 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?

a. Rs. 18.20 b. Rs. 70 c. Rs. 72 d. Rs. 88.25 **(Ans: c.)**

Solution: Let the cost price of the article be Rs.100

The profit is 22.5% on Cost price – Rs. 22.5

The Selling price is – Rs.100 + Rs.22.5 = Rs.122.5

S.P.		Profit
Rs. 122.5	×	Rs. 22.5
Rs.392		?

Profit = 392 × 22.5 / 122.5 = Rs. 72

4. By selling a table for Rs.330, a trader gains 10%. Find the cost price of the table.

a. Rs. 310 b. Rs. 300 c. Rs. 280 d. Rs.250 **(Ans: b.)**

Solution: Let the cost price of the article be Rs.100

The profit is 10% on Cost price – Rs.10

The Selling price is – Rs.100 + Rs.10 = Rs.110

C.P.	S.P.
Rs. 100	Rs. 110
?	Rs. 330

C.P. = 100 × 330 / 110 = Rs. 300

5. A sells a bicycle to B at a profit of 20% and B sells it to C at a profit of 25%. If C pays Rs. 225 for it, what did A pay for it?

a. 110 b. 150 c. 120 d. 100 **(Ans: b.)**

Solution: Let the cost price of the article be Rs.100

A Selling to B => The profit is 20% = 20Rs.

Therefore, the sales price is 100 + 20 = Rs.120

B Selling to C => The cost price of B is Rs.120

The profit = (25% of 120) = Rs.30

The Sales price = 120 + 30 = Rs.150

Cost price B Selling to C		Cost price A Selling to B	
C.P.	S.P.	C.P.	S.P.
Rs. 120	Rs. 150	Rs. 100	Rs. 120
?	Rs. 225	?	Rs. 180
C.P. = 225 × 120 / 150 = Rs. 180		C.P. = 180 × 100 / 120 = Rs. 150	

Therefore, the Cost Price of A is Rs. 150.

6. A mobile phone was sold for Rs.5060 at a gain of 10%. If it has been sold for Rs.4370, what would have been the gain?

a. 6% b. 4.5% c. 5% d. 7% **(Ans: c.)**

Solution: Let the cost price of the article be Rs.100

The profit is 10% on Cost price – Rs.10

The Selling price is – Rs.100 + Rs.10 = Rs.110

C.P.	S.P.
Rs. 100	Rs. 110
?	Rs. 5060

C.P. = 100 × 5060 / 110 = Rs. 4600

If it is sold at Rs. 4370 then Loss is = 4600 – 4370 = Rs.230

Therefore, Loss Percentage = 230 / 4600 × 100 = 5%(Loss)

7. Cost Price of 6 articles is equal to Selling Price of 4 articles, find the gain percent.

a. 45% b. 40% c. 50% d. 48% **(Ans: c.)**

Solution: Let the Cost Price of article be Rs.1.

Then the Cost Price of 6 Articles = 6 × 1 = Rs. 6

Selling Price of 4 Articles = Rs. 6

Therefore, Cost Price of 4 Articles = 4 × 1 = Rs.4

Profit = 6 – 4 = Rs. 2

Profit Percentage = Rs. 2 / Rs. 4 × 100 = 50%(Gain)

8. 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?

a. Rs.2000 b. Rs.2200 c. Rs.2400 d. Rs.2800 **(Ans: a.)**

Solution: Let price = x

1920 – x = x - 1280

2x = 3200; X = 1600

Now, for profit of 25% = 1600 + 25/100 = 400

∴ Net price = 1600 + 400 = 2000.

9. A man buys a cycle for Rs.1400 and sells it at a loss of 15%. What is the selling price of the cycle?

a. Rs.1090 b. Rs.1160 c. Rs.1190 d. Rs.1202 **(Ans: c.)**

Solution: Let the cost price of the article be Rs.100

The Loss is 15% on Cost price – Rs.15

The Selling price is – Rs.100 - Rs.15 = Rs.85

C.P.	S.P.
Rs. 100	Rs. 85
Rs.1400	?

S.P. = 85 × 1400 / 100 = Rs.1190

10. A man sold an article at a loss of 20%. If he had sold it for Rs.12 more, then he would have gained 10%. The cost price of the article is

a. 60 b. 40 c. 30 d. 22 **(Ans: b.)**

Solution: Let the cost of the article be X.

The loss on the article = 20% of X = 0.2X

The sales price when sold at loss = X – 0.2X = 0.8X

If he had sold it for Rs. 12 more, then he would have gained 10%.

Gain % = S.P - C.P; C.P = (0.8x + 12) = 1.1x - 0.8x

∴ 12 = 1.1x

∴ 12 = 0.3x ; ∴ x = 40

11. When a plot is sold for Rs.18700, the owner loses 15%. At what price must that plot be sold in order to gain 15%?

a. Rs.21000 b. Rs.22500 c. Rs.25300 d. Rs. 25800 **(Ans: c.)**

Solution: Let the cost of the plot be Rs.100.

Loss on Sale of Plot = (Rs. 100 × 15%) = Rs.15

Sales Price = Rs.100 – Rs.15 = Rs.85

To get 15% Gain when Cost is Rs. 100

Profit Expected on the plot = (Rs.100 × 15%) = Rs. 15

Sales Price = Rs.100 + Rs.15 = Rs.115

Sales	Percentage
Rs. 18700	Rs. 85
?	Rs. 115

Sales = 18700 × 115 / 85 = Rs.25300

12. 100 oranges are bought at the rate of Rs.350 and sold at the rate of Rs.48 per dozen. The percentage of profit or loss is:

a. $14^{2}/_{7}$% gain b. 15% loss c. $14^{2}/_{7}$% loss . 15% loss **(Ans: a.)**

Solution: Cost of one orange = 350 / 100 = Rs. 3.50

Selling price of one orange = 48 / 12 = Rs. 4 (1 Dozen = 12 Units)

Profit = 4 – 3.50 = Rs. 0.50

Profit% = 0.50 / 3.50 × 100 = 100 / 7 % = $14\ ^{2}/_{7}$%.

13. 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 percentage is:

a. $5^{15}/_{17}$% loss b. $5^{15}/_{17}$% gain c. $6^{2}/_{3}$% gain d. None **(Ans: b.)**

Solution: Let the cost of one transistor be Rs.100.

Profit = 100 × 20/100 = Rs.20

Sales Price = 100 + 20 = Rs. 120

Cost of 1st transistor = 100 / 120 × 840 = Rs. 700

Let the cost of second transistor be Rs.100.

Loss = 100 × 4/100 = Rs.4

Sales Price = 100 – 4 = Rs.96

Cost of 2nd transistor = 100 / 96 × 960 = Rs.1000

So, Total Cost of two transistor = (700 + 1000) = Rs.1700

Total Sales Price of two transistor = (840 + 960) = Rs.1800

Profit% = (1800 – 1700) / 1700 × 100 = $5^{15}/_{17}$%

14. A trader mixes 26 kg of rice (Rs.20 per kg) with 30 kg of other variety (Rs.36 per kg) and sells the mixture at Rs. 30 per kg. His profit percentage is:

a. No profit, no loss b. 5% c. 10% d. 8% **(Ans: b.)**

Solution: Cost of Mixed 56 Kg Rice = (26 × 20) + (30 × 36) = Rs.1600.

Sales Price of 56Kg Rice = (56 × 30) = Rs.1680.

Profit% = (1680 – 1600) / 1600 × 100 = 5%(Gain).

15. Among some articles brought, 6 articles were bought for Rs.5 and sold 5 articles for Rs.6. Gain percent is:

a. 30% b. $33^{1}/_{3}$% c. 35% d. 44% **(Ans: d)**

Solution: Cost of 6 Article = Rs. 5

Therefore, the cost of 1 Article = 5/6

5 Articles were sold = Rs.6

Sales price of one article = 6/5

Gain percentage = (6/5 – 5/6) / 5/6 × 100 = 11/25 × 100 = 44%

Chapter 11: Simple Interest and Compound Interest

Particulars	Formula
1. Simple Interest	S.I = PTR / 100
2. Amount on Simple Interest	A = P + S.I.
3. Compound Interest	C.I. = A – P
4. Amount on Compound Interest	$A = P(1 + r)^n$

1. Find the interest to be paid on a loan of Rs.3000 at Simple Interest of 5% per year for 5 years.

a. Rs. 750/- b. Rs. 760/- c. Rs. 780/- d. Rs. 790/- **(Ans: a.)**

Solution: S.I = PTR / 100

P = 3000 T= 5 R = 5/100

$SI = \frac{3000 \times 5 \times 5}{100}$ => SI = Rs. 750/-

2. Find the amount to be back on a loan of Rs.18,000 at 5.5% per annum for 3 years.

a. Rs.20900/- b. Rs. 20000/- c. Rs. 20970/- **(Ans: c.)**

Solution: S.I = PTR / 100

P = 18000 T = 3 R = 5.5/100

$S.I. = \frac{18000 \times 3 \times 5.5}{100}$ = Rs. 2970/-

Amount = P + S.I.

= 18000 + 2970 = Rs. 20970/-

3. In how many years will a sum of money triple itself at 25% per annum simple interest?

a. 7 years b. 8 years c. 9 years **(Ans: b.)**

Solution: Let the Principle be Rs. 100; Amount will be Rs. 300.

Amount = Principle + Simple Interest

Principle = 100, Amount = 300, R= 25/100, T = T

$300 = 100 + \left(\frac{100 \times T \times 25}{100}\right)$

200 = 25T => T = 8years.

4. What rate per cent per annum will produce Rs.250 as simple interest on Rs.6000 in 2.5 years?

a. $^5/_3\%$ b. $^6/_3\%$ c. $^5/_4\%$ **(Ans: a.)**

Solution: S.I. = Rs.250 T=2.5 years P = Rs.6000 R = R/100

S.I. = PTR / 100

$250 = \frac{6000 \times 3 \times R}{100} \Rightarrow \frac{250 \times 100}{6000 \times 2.5} = R \Rightarrow R = {}^5/_3\%$

5. If Simple Interest on certain sum is Rs.360 for 2 years at 6% rate of interest, find the sum.

a. Rs.3000/- b. Rs.3500/- c. Rs.4500/- **(Ans: a.)**

Solution: S.I. = Rs.360 T=2 years R = 6/100 P = P

S.I. = PTR / 100

$360 = \frac{P \times 2 \times 6}{100} \Rightarrow \frac{360 \times 100}{6 \times 2} = P \Rightarrow P = Rs.\ 3000$

6. In what time will a sum of Rs.2000 amounts Rs 2,240 at the rate of 4% per annum?

a. 2.5 years b. 3 years c. 4 years **(Ans: b.)**

Solution: P = Rs.2000 A = Rs. 2240 R = 4/100 T = T

S.I. = PTR / 100

$S.I. = \frac{2000 \times T \times 4}{100} \Rightarrow S.I. = 80T$

Amount = Principle + S.I.

Rs. 2240 = Rs. 2000 + 80T

240 / 80 = T => T = 3years

7. In how many years will a sum of money double itself at the rate of 10% per annum simple interest.

a. 15 years b. 12 years c. 10 years **(Ans: c.)**

Solution: Let the Principle be Rs. 100; Amount will be Rs. 200.

P = 100 A = 200 R = 10/100 T = T

Amount = P + S.I.

$200 = 100 + (\frac{100 \times T \times 10}{100}) \Rightarrow 100 = 10T \Rightarrow T = 10$ years

8. Find the Simple Interest on Rs.60,000 at 5.5% per annum for 9 months.

a. Rs. 2,475 b. Rs. 2,476 c. Rs. 2,478 **(Ans: a.)**

Solution: Let the Principle be Rs. 100; Amount will be Rs. 200.

P =Rs.60000 S.I. = Rs.55 T = 9/12 R = 5.5/100

S.I. = PTR / 100

$S.I. = (\frac{60000 \times 9 \times 5.5}{12 \times 100}) \Rightarrow S.I. = Rs.\ 2,475$

9. Find the Simple Interest for Rs.6000 for the period from 5th Feb 2005 to 18th April 2005 at the rate of 15% pa.

a. Rs. 177.5342 b. Rs. 178 c. Rs. 179 **(Ans: a.)**

Solution: P =Rs.6000 R = 15/100

T = From 5th Feb to 18th April => 23+31+18 / 365

S.I. = PTR / 100

$S.I. = (\frac{6000 \times 72 \times 15}{365 \times 100}) \Rightarrow S.I. = Rs.\ 177.5342$

10. At what rate percent per annum, will a sum of money double in 16 years?

a. $6^2/_4$ % p.a. b. $6^1/_4$ % p.a. c. $6^3/_4$ % p.a **(Ans: a.)**

Solution: Let the Principle be Rs. 100; Amount will be Rs. 200.

T = 16 years

$Amount = P + S.I. \Rightarrow 200 = 100 + (\frac{100 \times 16 \times R}{100})$

$100 = 16R \Rightarrow R = 6^1/_4$ % p.a.

11. What is the difference between compound interest and simple interest for 2 years on the sum of 1260 at 4% per annum?

a. Rs. 2,075 b. Rs. 2,016 c. Rs. 2,078 **(Ans: b.)**

Solution: P = Rs.1260 T = 2 years R = 4/100

$A = P(1 + r)^n \Rightarrow A = 1260(1 + 4/100)^2$

A = Rs.1362.816

C.I. = A – P => C.I. = 1362.816 – 1260 = Rs. 102.816

S.I. = PTR / 100 => S.I. = 1260 × 2 × 4 / 100 = Rs.100.8

Difference = C.I. – S.I. => Difference = 102.816 – 100.8

= Rs. 2.016

12. Find the compound interest on Rs 20,000 at 6% rate of interest p.a for 2 years

a. Rs. 2,400 b. Rs. 2,472 c. Rs. 2,475 **(Ans: b.)**

Solution: $A = P(1 + r)^n$, C.I. = A – P

P = Rs. 20000 R = 6/100 n = 2years

$A = 20000(1 + 6/100)^2 \Rightarrow$ Rs.22472

C.I. = A – P => C.I. = 22472 – 20000 = Rs. 2472

13. In what time will Rs.4000 amounts to Rs.4840 at 10% compound interest?

a. 2 years b. 3 years c. 4 years **(Ans: a.)**

Solution: $A = P(1 + r)^n$, C.I. = A – P

A = Rs.4840 P = Rs.4000 R = 10/100

$4840 = 4000(1 + 10/100)^n \Rightarrow 4840/4000 = (1 + 10/100)^n$

$\Rightarrow 121 / 100 = (110 / 100)^n = 11^2/10^2 = (11/10)^n \Rightarrow n = 2$

14. If a sum of 2,000 amount to 2,880 at 20% rate of compound interest P.A., find the period for which compound interested is calculated.

a. 4 years b. 2.5 years c. 2 years **(Ans: c.)**

Solution: $A = P(1 + r)^n$, C.I. $= A - P$

$A = 2880 \quad P = 2000 \quad r = 20/100$

$2880 = 2000(1 + 20/100)^n$

$2880/2000 = (1 + 20/100)^n$

$144 / 100 = (120 / 100)^n$

$(12 / 10)^2 = (12 / 10)^n \Rightarrow n = 2$

15. If Rs. 1600 amounts to Rs. 1,764 in 2 years at a certain rate of compound interest. Find the rate of interest per annum

a. 4% b. 6% c. 5% **(Ans: c.)**

Solution: $A = P(1 + r)^n$, C.I. $= A - P$

$1764 = 1600 (1 + r)^2 \Rightarrow 1764 / 1600 = (1 + r)^2$

$42 / 40 = 1 + r$

$R = 5\%$

Quantitative Aptitude

Chapter 12: Ratio and Proportion, Partnership

1. Divide 70 in the ratio 3:7

a. 21 and 49 b. 22 and 48 c. 23 and 45 d. None **(Ans: a.)**

Solution: A = 70 × 3 / 10 = 21; B = 70 × 7 / 10 = 49

2. Divide Rs.2700 among a, b, c in the ratio 2 : 3 : 4

a. 600, 900 and 1100 b. 600, 900 and 1200 c. 650, 950 and 150 **(Ans: b.)**

Solution: A = 2700 × 2 / 9 = 600

B = 2700 × 3 / 9 = 900

C = 2700 × 4 / 9 = 1200

3. The ratio between two number is 3:4. If each number be increased by 2 the ratio becomes 7:9. Find the numbers

a. 10 and 11 b. 11 and 12 c. 12 and 16 (Ans: c.)

Solution: Let the numbers be 3x and 4x

When increased by 2

The number becomes = 3x +2 and 4x + 2

Therefore, the Equation goes,

$$\Rightarrow \frac{3x+2}{4x+2} = \frac{7}{9} \Rightarrow 9(3x+2) = 7(4x+2) \Rightarrow 27x + 18 = 28x + 14 \Rightarrow x = 4;$$

Hence the numbers are = 3x = 3 × 4 = 12; 4x = 4 × 4 = 16

4. The sum of two numbers is 60 and their difference is 6. What is the ratio of the two numbers?

a. 11 : 9 b. 9 : 11 c. 9 and 10 **(Ans: a.)**

Solution: Let the numbers be a and b

Therefore, the sum and difference,

$a + b = 60$ & $a - b = 6$

$a + b = 60$

(+) $a - b = 6$

$2a = 66$

$a = 66 / 2 = 33$

Substitute $a = 33$ in a equation; $33 + b = 60$; $b = 60 - 33 = 27$

Ratio = 33 : 27 => 11 : 9

5. Find the mean proportional between 3 and 75

a. 12 b. 10 c. 15 d. 20 **(Ans: c.)**

Solution: Mean proportional = $\sqrt{ab} = \sqrt{3 \times 75} = 15$

6. Three partner Rahul, Puneet and Chandan invest Rs.1600, Rs.1800 and Rs.2300 respectively in a business. How should they divide a profit of Rs399

a. 10, 11 & 12 b. 112, 126 & 161 c. 12, 13 & 15 **(Ans: b.)**

Solution: Total investment = 1600 + 1800 + 2300 = 5700

Share of Profits: Rahul = 399 × 1600 / 5700 = Rs.112

Puneet = 399 × 1800 / 5700 = Rs. 126

Chandan = 399 × 2300 / 5700 = Rs. 161

7. A and B invested in the ratio 3:2 in a business. If 5% of the total profit goes to charity and A's share is Rs.855, find the total profit.

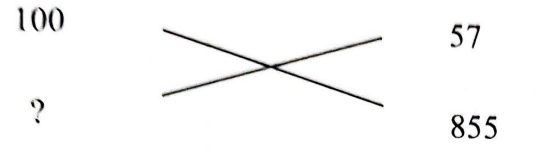
a. 1000 b. 1100 c. 1500 d. 1005 **(Ans: c.)**

Solution: Let the total profit be Rs.100. Then, Rs. 5 goes to charity. Now, Rs. 95 is divided in the ratio 3:2.

$\therefore$ A's Share $= 95 \times \frac{3}{5} =$ Rs.57;

A's actual Share is Rs.855

$\therefore$ Total Profit A's Share



Total Profit = 855 × 100 / 57 = Rs. 1500

9. A began a business with Rs.4500 and was joined afterwards by Rs.5400. If the profits at the end of year was divided in the ratio 2:1 when did B join as a partner

a. 6 b. 5 c. 8 d. 7 **(Ans: d.)**

Solution: A's Share = 4500 × 12 = 54000

B's Share = 5400 × (12 – x) = 64800 – 5400x

= 54000 : 64800 – 5400x :: 2 : 1

=> (54000 × 1) = (64800 – 5400x) × 2

=> 54000 / 2 = 64800 – 5400x

=> 64800 – 27000 = 5400x => x = 7

10. In what proportion must sugar at Rs.13.00 per kg be mixed with sugar at Rs.13.65 per kg so that the mixture be worth Rs.13.20 a kg?

a. 9 : 5 b. 8 : 5 c. 9 : 4 d. None (Ans: c.)

Solution: $\frac{x}{13} + \frac{x}{13.65} = \frac{1}{13.20}$

(13.65x + 13x) × 13.20 = 13 × 13.65

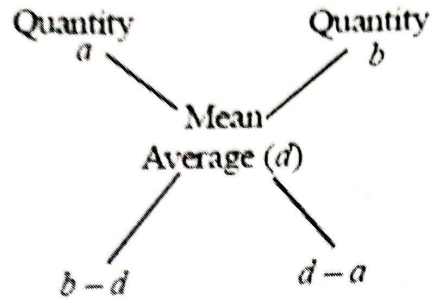
351.78x = 177.45

X = 177.45 / 351.78 = 9 : 4

OR

$$\frac{\text{Quantity of Cheaper}}{\text{Quantity of Dearer}} = \frac{\text{Price of Dearer} - \text{Mean Price}}{\text{Mean Price} - \text{Price of Cheaper}}$$

Quicker representation of Alligation Rule :



Quantity of a / Quantity of b = b – d / d – a

= Quantity of cheaper / Quantity of dearer = $\frac{13.65-13.20}{13.20-13.00}$

= 0.45 / 0.20 => 45 / 20 => 9 / 4 or 9 : 4

Hence, the required ratio is 9 : 4

11. A bag contains 50 paise, 25 paise and 10 paise coins in the ratio 5: 9: 4 amounting to Rs.206. Find the number of coins of each type.

a. 205, 305 & 165 b. 200, 360 & 160 c. 100, 100 & 100 **(Ans: b.)**

Solution: Let the ratio be 5x, 9x and 4x

To convert all paise to rupee is 50 paise – 2 coins, 25 paise – 4 coins and 10 paise – 10 coins.

Value = $\frac{5x}{2} + \frac{9x}{4} + \frac{4x}{10}$ = 206 => 103x = 206 × 20

X = 40

A = $\frac{5x}{2}$ = 5 × 40 / 2 = 100; B = $\frac{9x}{4}$ = 9 × 40 / 4 = 90; C = $\frac{4x}{10}$ = 4 × 40 / 10 = 16

Number of Coins = A= 100 * 2 = 200; B = 90 * 4 = 360; C = 16 * 10 = 160

12. A man can complete 5/8 of a job in 10 days. At their rate, how many more days will it take him to complete the job?

a. 6 b. 7 c. 8 d. 9 **(Ans: a.)**

Solution: Work Done = 5/8; Remained = 3/8

$$W_1 \times T_2 = W_2 \times T_1$$

$$\frac{5}{8} \times X = \frac{3}{8} \times 10 \Rightarrow X = 6$$

13. A company had provision of food for 150 men for 45 days. After 10 days,25 men left the company. No. of days for which the remaining food will last is _____.

a. 41 b. 40 c. 39 d. 42 **(Ans: d.)**

Solution: After 10 days:

For 150 men, provision will last (45 - 10) days = 35 days

⇒ For 1 man, the provisions will last

= 150 × 35 days

And for (150 - 25) = 125 men, the provisions will last for

$$= \frac{150 \times 35}{125} = 42 \text{ days.}$$

14. The ratio of A to B is 4 : 5 and that of B to C is 2 : 3. If A equals 800, C equals:

a. 1,500 b. 2,000 c. 1,200 d. 1,000 **(Ans: a.)**

Solution: A : B = 4 : 5, B : C = 2 : 3

A : B : C = (4 × 2) : (5 × 2) : (5 × 3),

A : B : C = 8 : 10 : 15

If A equals 800(8/33), then C equals 1,500(15/33).

15. A's and B's shares in a business are in the ratio of 5:3. If A has invested ` 70,000 for 12 months, for what period B has invested 60,000?

a. 7 months b. 7.4 months c. 8 months d. 8.4 months **(Ans: d.)**

Solution: A's capital be C1 = 70000, B's capital be C2 = 60000

A's time be T1= 12 months, B's time be T2 = X months

A's share: B's share = 5 : 3

Apply formula: $\frac{\text{Profit of A}}{Profit\ of\ B} = \frac{C1 \times T1}{C2 \times T2}$

$$=> 5 / 3 = 70000 \times 12 / 60000 \times X$$

$$300000x = 2520000$$

$$X = 252 / 30 = 8.4 \text{ months}$$

Quantitative Aptitude

Chapter 13: Time and Work

1. A takes 8 days and B takes 10 days to complete a job. How much time will take to complete the work together?

a. 4 days b. 5 days c. $4^4/_9$ days d. $5^1/_4$ days **(Ans: c.)**

Solution: A's 1 day work is 1/8, B's 1 day work is 1/10.

(A+B)'s one day work = 1/8 + 1/10 = 9/40.

Both will together finish the work in 40/9 = $4^4/_9$ days.

2. A alone can complete a work in 12 days. A and B together can complete it in 8 days. How long will B alone take to complete the work?

a. 20 Days b. 16 Days c. 24 Days d. 18 Days **(Ans: c.)**

Solution: A's 1 day's work = 1 /12, (A+B)'s 1 day's work = 1 /8

B's 1 day's work = x

B's 1 day's work = $\frac{1}{8} = \frac{1}{12} + x$

B's 1 day's work = 1 /24 B alone can do the work in 24 days.

3. A and B can do a piece of work in 12 days, B and C in 8 days and C and A in 6 days. How long would B take to do the same work alone?

a. 48 days b. 40 days c. 24 days d. 32 days **(Ans: a.)**

Solution: (A + B)'s 1 day's work = 1/12.....(i)

(B + C)'s 1 day's work = 1/8 ----------(ii)

(C + A)'s 1 day's work = 1/6 ----------(iii)

On adding,

2(A + B + C)'s 1 day's work = 1/12 + 1/8 + 1/6 = 2 + 3 + 4/24

(A+ B + C)'s 1 day's work = 9/24 × 1/2 =9/48 -----(iv)

On, subtracting (iii) from (iv),

B's 1 day's work = 9/48 - 1/6 =9 - 8/48 =1/48

B can complete the work in 48 days.

4. 10 men can finish a piece of work in 10 days where as it takes 12 women to finish it in 10 days. If 15 men and 6 women undertake to complete the work, how many days they will takes to complete it

a. 4.5 days b. 5 days c. 6 days d. 7 days **(Ans: b.)**

Solution: 10 men can finish a piece of work = 10 days.

12 women can finish a piece of work = 10 days

Therefore, 1 man can complete a piece of work = 10 × 10 = 100 days

1 woman can finish a piece of work = 12 × 10 = 120 days

The work done by men and woman = 1/100 & 1/120

15 men + 6 women = (15 × 1/100) men + (6 × 1/120) women

= 3/20 + 1/20 = 5 days

5. A can do a work in 4 days, B in 15 days and C in 10 days. Find the time taken by A, B, C to do the work together

a. $1^{9}/_{11}$ days b. $2^{9}/_{11}$ days c. $3^{9}/_{11}$ days d. 3 days **(Ans: a.)**

Solution: A + B + C= 1/4 + 1/5 + 1/10 = 1120

A, B, C together can-do work in 20 / 11 = $1^{9}/_{11}$days

6. A's twice as good a work man as B. They together finish piece of work in 18 days. In how many days A alone finish the work.

a. 26 days b. 27 days c. 25 days d. 20 days (Ans: b.)

Solution: A + B one day work = 1/18

Since A is twice as good as B = 2 : 1, total work is 3.

A's 1 day's work=1/18*2/3=1/27.

A can alone finish the work is 27 days

7. A can do a piece of work in 10 and b in 20 days. They work together but 2 days before completion A leaves. In how many days what's the work completed?

a. 1/3 b. ¼ c. 1/5 d. 1 **(Ans: b.)**

Solution: A's 1 day = 1/10; B's 1 day = 1/20

A's 2 days work = 2/10; B's 2 days work = 2/20 = 1/10

So, Remaining work = 1 - 1/10 = 9/10

(A+B)'s 1 day work= (1/10 + 1/20) = 3/20

Total work done by both A and B=1/4

8. A can lay Railway Track between 2 given stations in 16 days and b can do the same job in 12 days. With the help of C, they did the job in 4 days. Find in how many days 'C' can alone do he job?

a. $9^4/_5$ days b. $9^3/_5$ days c. $8^3/_5$ days d. 8 **(Ans: b.)**

Solution: A + B + C's one day work = 1/4

A + B's 1 day work = 1/16 + 1/12 = 7/48.

C's 1 day work = ¼ - 7/48 = 5/48

C can complete the work in 48/5 days = $9^3/_5$ days

9. Kamal can do a work in 15 days and Vimal can 50% more efficient than Kamal the number of days Vimal. Find the no. of days for Vimal to do the work alone.

a. 11 days b. 12 days c. 10 days d. None **(Ans: c.)**

Solution: If Kamal is 100% efficient then Vimal will be 150% efficient because it is given that Vimal is 50% more efficient than Kamal.

Now, let's find the ratio of the efficiency as follows:

$V / K = 150 / 100 = 3 / 2 = 3 : 2$

Suppose Vimal takes x days to do the work, then we have:

$3 : 2 :: 15 : x \Rightarrow 3 / 2 = 15 / x$

$\Rightarrow 3x = 15 \times 2 \Rightarrow 3x = 30$

$\Rightarrow x = 30 / 3 \Rightarrow x = 10$ days

Hence, Vimal will take 10 days to do the same piece of work.

10. 5 men prepare 10 toys in 6 days working 6 hrs a day. How many days can 12 min prepare 16 toys working 8 hrs in a day?

a. 2 b. 1 c. 3 d. 4 **(Ans: c.)**

Solution: $M1 \times D1 \times T1 \times W2 = M2 \times D2 \times T2 \times W1$

$5 \times 6 \times 6 \times 16 = 12 \times D2 \times 8 \times 6$

$D2 = 3$

11. 6 men working 8 hrs per day earn 1680/week. How much will 9 men working 6 hrs per day earn per week?

a. 1800 b. 1850 c. 1890 d. 1900 **(Ans: c.)**

Solution: $M1 \times D1 \times W2 = M2 \times D2 \times W1$

$6 \times 8 \times W2 = 9 \times 6 \times 1680.$

$W2 = 1890$

12. A, B and C can do a work in 6, 8, 12 days and earn Rs.1350. What is B's share?

a. 400 b. 450 c. 390 d. 300 **(Ans: b.)**

Solution: A can complete the work in 6 days; 1 day work of A = 1/6

B can complete the work in 8 days; 1 day work of B = 1/8

C can complete the work in 12 days; 1 day work of C= 1/12

Ratio between the 1-day work of A, B, C =1/6 : 1/8 : 1/12

Multiply the ratio by 24. = 24/6 : 24/8 : 24/12 = 4 : 3 : 2

Let; A=4x, B=3x, C= 2x

Together they get an amount of 1350.

$4x + 3x + 2x = 1350 \Rightarrow 9x = 1350 \Rightarrow x = 150$

So, the share of B = 3x = 3 × 150 = Rs. 450.

13. A, B and C together can complete a piece of work in 30 minutes. A and B together can complete the same work in 50 minutes. C alone can complete the work in

a. 50 min. b. 80 min. c. 75 min d. 80 min **(Ans: c.)**

Solution: Work done by (A + B + C) in 1 minute = 1 / 30

Work done by (A + B) in 1 minute = 1 / 50

Work done by C alone in 1 minute = 1 / 30 – 1 / 50

= 5 – 3 / 150 = 2 / 150 = 1 / 75

C alone will complete the work in 75 minutes.

14. A and B can complete a piece of work in 8 days, B and C can do it in 12 days, C and A can do it in 8 days. A, B and C together can complete it in

a. 7 days b. 6 days c. 4 days d. 5 days **(Ans: b.)**

Solution: (A + B)'s 1 day's work = 1 / 8; (B + C)'s 1 day's work = 1 / 12

(C + A)'s 1 day's work = 1 / 8

On adding, 2 (A + B + C)'s 1 day's work =1 / 8 + 1 / 12 + 1/8

= 3 + 2 + 3 / 24 = 8 / 24 = 1 / 3

(A + B + C)'s 1 day's work = A + B + C = 2 (1/3) = 1/6

Hence, the work will be completed in 6 days

15. A, B and C individually can do a work in 10 days, 12 days and 15 days respectively. If they start working together, then the number of days required to finish the work is

a. 2 days b. 4 days c. 16 days d. 8 days **(Ans: b.)**

Solution: Work done by A, B and C in 1 day = 1 / 10 + 1 / 12 + 1 / 15

= 6 + 5 + 4 / 60 = 15 / 60 = 1 / 4

Required time = 4 days

Quantitative Aptitude

Chapter 14 - Pipes and Cisterns

1. A pipe can fill a cistern in 6 hours. Due to a leak in its bottom, it is filled in 7 hours. When the cistern is full in how much time will it be emptied by the leak?

Solution: $1/6 - 1/x = 1/7 \Rightarrow x = 42$ hrs

2. Two pipes A and B can separately fill a tank in 36 hours and 40 hours respectively. If both the pipes are opened simultaneously, how much time will be taken to fill the tank?

Solution: $1/36 + 1/45 = 1/20 \Rightarrow$ 20 hours

3. Two pipes A and B can fill a cistern in 10 hours and 12 hours respectively, and a third pipe C can empty it in 20 hours. How long will it takes to fill the cistern if all the three are opened at the same time?

Solution: $1/10 + 1/12 - 1/20 = 2/15$ so time $= 15/2 = 7.5$ hours

4. Three pipes A, B and C can fill a tank in 6 minutes, 8 minutes and 12 minutes respectively. The pipe C is closed 6 minutes before the tank is filled. In what time will the tank be full?

Solution: $A + B + C = x/6 + x/8 + (x - 6)/12 = 4$ min

5. If three taps are opened together, a tank is filled in 12 hrs. One of the taps can fill it in 10 hrs and another in 15 hrs. How does the third tap work?

Solution: $A + B + C = 1/10 + 1/15 + 1/x \Rightarrow x = -12$

6. Two pipes A and B can fill a cistern in 20 and 30 minutes respectively, and a third pipe C can empty it in 40 minutes. How long will it take to fill the cistern if all the three are opened at the same time?

Solution: $1/20 + 1/30 - 1/40 = 7/120 \Rightarrow 120/7 = 17\frac{1}{7}$

7. Two pipes A and B can separately fill a tank in 12 minutes and 15 minutes respectively. Both the pipes are opened together but 4 minutes after the start the pipe A is turned off. How much time will it take to fill the tank?

Solution: A & B = Total / Time;

L.C.M of 12 and 15 = 60 => A = 60/12 = 5 units/min & B = 60/15 = 4units/min

Both pipes filles in first 4 minutes = 4(4 + 5) = 36 units.

Left to be filled = 60 – 36 = 24 units.

Time taken by B = 24 / 4 = 6 minutes;

Therefore, total time taken to fill = 6 + 4 = 10 min

8. Two pipes P and Q can fill a cistern in 12 and 15 minutes respectively. Both are opened together, but at the end of 3 minutes the first is turned off. How much longer will the cistern take to fill?

Solution: 3/ 12 + x / 15 = 1 => x = 11 1/ 4

9. A cistern has a leak which would empty the cistern in 20 minutes. A tap is turned on which admits 4 litres a minute into the cistern, and it is emptied in 24 minutes. How many litres does the cistern hold?

Solution: 1/x - 1/20 = - 1/24 => x = 120 => 120× 4 = 480

10. Two taps can separately fill a cistern 10 minutes and 15 minutes respectively and when the waste pipe is open, they can together fill it in 18 minutes. The waste pipe can empty the full cistern in?

Solution: 1/10 + 1/15 - 1/x = 1/18 => x = 9

11. A cistern is filled by a tap in 3 1/2 hours. Due to leak in the bottom of the cistern, it takes half an hour longer to fill the cistern. If the cistern is full how long will it take the leak to empty it?

Solution: 2/7 - 1/x = ¼ => x = 28

12. Two pipes A and B can fill a tank in 4 and 5 hours respectively. If they are turned up alternately for one hour each, the time taken to fill the tank is?

Solution: Tank filled in 2 hrs => (¼ * 1hr) + (1/5 * 1 hr) = 9/20

Tank filled in 4 hrs => 9/20 * 2 = 19/10

Remaining Part = 1 – 9/10 = 1/10

To fill remaining capacity = 1/10 * 4hrs * 60mintutes = 24 minutes

Total Time = 4hrs + 24 minutes = 4hrs & 24minutes.

13. Two pipes A and B can fill a cistern in 12 and 15 minutes respectively. Both are opened together but after 3 minutes A is turned off. After how much more time will the cistern be filled?

Solution: 3/12 + (3 + x)/15 = 1 => x = 8 ¼

14. A cistern is normally filled in 8 hours but takes two hours longer to fill because of a leak in its bottom. If the cistern is full, the leak will empty it in?

Solution: 1/8 - 1/x = 1/10 => x = 40hrs

15. Two pipes A and B can separately fill a tank in 12 and 15 minutes respectively. A third pipe C can drain off 45 litres of water per minute. If all the pipes are opened, the tank can be filled in 15 minutes. What is the capacity of the tank?

Solution: 1/12 + 1/15 - 1/x = 1/15 => x = 12 => 12 × 45 = 540ltrs

Chapter 15 – Speed, Time and Distance

1. A train starts from a place A at 6 a.m. and arrives at another place B at 4.30 p.m. on the same day. If the speed of the train is 40 km per hour, find the distance travelled by the train?

a. 400 km b. 320 km c. 230 km d. 420 km **(Ans: d.)**

Solution: Time = $10^1/_2$ hours =21/2 hours

Speed = 40 km/ hour

Distance = Speed × Time = 40 × 21/2= 420 km

2. A man riding his bicycle covers 150 metres in 25 seconds. What is his speed in km per hour?

a. 20 b. 23 c. 21.6 d. 25 **(Ans: b.)**

Solution: Speed = Distance / Time

= 150/ 25 = 6 m/sec

= 6 × 3600 / 1000 km/hr = 21.6 km/ hour

3. Two men start together to walk a certain distance, one at 4 km/hour and another at 3 km/hour. The former arrives half an hour before the latter. Find the distance.

a. 9 km b. 6 km c. 7 km d. 8 km **(Ans: b.)**

Solution: If the required distance be x km, then

x / 3 – x / 4 = 1 / 2

4x – 3x / 12= ½

x / 12 = 1 / 2

x = 6km

4. A train covers a certain distance in 210 minutes at a speed of 60 km/hour. The time taken by the train, to cover the same distance at a speed of 80 km/ hour is:

a. 3 hours b. $4^5/_8$ hours c. $2^5/_8$ hours d. $3^5/_8$hours **(Ans: c.)**

Solution: Speed of train = 60 km/ hour

Time = 210 minutes = 3 ½ hours = 7 / 2 hours

Distance covered= 60 × 7 / 2= 210 km

Time taken at 80 km/ hours = 210 / 80 = $2^5/_8$ hours

5. An athlete runs 200 metres race in 24 seconds. His speed (in km/ hour) is:

a. 30 b. 28.5 c. 24 d. 20 (Ans: a.)

Solution: Speed = Distance ÷ Time

= 200 ÷ 24 metres / seconds

= [(200 ÷ 24) × (18 ÷ 5)]

= 3600 ÷ 120

= 30 km/ hour

6. A car driver leaves Bangalore at 8.30 A.M. and expects to reach a place 300 km from Bangalore at 12.30 P.M. At 10.30 he finds that he has covered only 40% of the distance. By how much he has to increase the speed of the car in order to keep up his schedule?

a. 30 km/hour b. 35 km/hour c. 40 km/hour d. 45 km/hour **(Ans: a.)**

Solution: Distance covered by car in 2 hours = 300 × 40 ÷ 100 = 120 km

Remaining distance = 300 – 120 = 180 km

Remaining time = 4 – 2 = 2 hours

Required speed = 180 km ÷ 2 hours = 90 km/ hour

Original speed of car = 120 ÷ 2 = 60 km/ hour

Required increase in speed = 90 - 60 = 30 km/ hour

7. A boy goes to his school from his house at a speed of 3 km/hour and returns at a speed of 2 km/ hour. If he takes 5 hours in going and coming, the distance between his house and school is:

a. 6.5 km b. 5.5 km c. 5 km d. 6 km **(Ans: d.)**

Solution: Let the required distance be x km. Then,

x / 3 + x / 2 = 5

2x + 3x / 6 = 5

5x = 6 ×5

x = 6 × 5 ÷ 5

x = 6 km

8. A boy runs 20 km in 2.5 hours. How long will he take to run 32 km at double the previous speed?

a. 5 hours b. 4 ½ hours c. 2 ½ hours d. 2 hours **(Ans: d.)**

Solution: The boy covers 20 km in 2 ½ hours.

Speed = 20 ÷ 2.5 hours = 8 km/ hour

New speed = 2 × 8 km/ hour = 16 km/ hour

Time = 32 km ÷ 16 km/ hour = 2 hours

9. A car travelling at a speed of 40 km/hour can complete a journey in 9 hours. How long will it take to travel the same distance at 60 km/hour?

a. 4 hours b. 4 ½ hours c. 6 hours d. 3 hours **(Ans: c.)**

Solution: Total distance covered = Speed × Time

= 40 km/hour × 9 hours = 360 km.

The required time at 60 km/ hour = 360 ÷ 60 = 6 hours

10. If the speed of a bus is 40km/hr and 60 km/hr while reaching a city and coming back, what is the ratio of the time taken?

a. 3:2 b. 2:3 c. 4:5 d. 5:4 **(Ans: a.)**

Solution: Speed is inversely proportional to time

Ratio of speed = 40:60 = 2:3, Ratio of time = 3:2

11. Excluding the stoppages the speed of a bus is 64km/hr and including the stoppage the speed of a bus is 48 km/hr. How many minutes does the bus stop per hour due to stoppages?

a. 15 min b. 20 min c. 25 min d. 30 min **(Ans: a.)**

Solution: Time taken = (Difference between distance covered with and without stoppages) / (Distance covered without stoppage).

Distance covered in an hour without stoppage = 64 km/hr.

Distance covered in an hour with stoppage = 48 km/hr.

Due to stoppages, it covers (64 – 48) = 16km/hr less

Time taken to cover 16km = 16 / 64 × 60 = 15 min

Stoppage time = 15 min

12. A train is travelling at a speed of 160 km/hour. It takes 15 hours to cover the distance from city A to city B. Find the distance between the two cities.

a. 2400 km b. 2500 km c. 3000 km **(Ans: a.)**

Solution: Total distance covered = Speed × Time

Distance = 160 × 15 = 2400km

13. A car travelling from city A to city C completes the journey in 3 hours, whereas a person travelling on a bike completes the journey in 5 hours. What is the speed of the man on the bike if the car is travelling at 45 kmph?

a. 30kmph b. 27kmph c. 25kmph **(Ans: b.)**

Solution: Distance = Speed × Time

Speed = 45km/hour, Time= 3

∴ Distance = 45 × 3 = 135km

Using the distance, we can find the speed of the bike

Formula used, Speed = Distance / Time

Time taken by bike is 5 hours

∴ Speed = 135 / 5 = 27

14. If an employee walks 10 km at a speed of 3 km/hr, he will be late by 20 minutes. If he walks at 4 km/hr, how early from the fixed time he will reach?

a. 30 min b. 25min c.27.5min (Ans: a.)

Solution: Time taken at 3 km/hr = Distance/speed = 10/3

Actual time is obtained by subtracting the late time

So, Actual time = 10/3 – 1/3 = 9/3 = 3 hour

Time taken at 4 km/hr = 10/4 hr

Time difference = Actual time – time taken at 4 km/hr

= 3 – 10/4

= 1/2 hour

Hence, he will be early by 30 minutes

Chapter 16 – Train Problems

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

a. 200 metres b. 225 metres c. 245 metres d. 250 metres **(Ans: c.)**

Solution: Speed = [45 X 5/18] m/sec = [25/2] m/sec

Time = 30 seconds

Let the length of bridge be x metres.

Then, (130 + x) / 30 = 25 / 2 => 2 (130 + x) = 750 => x = 245 m.

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

a. 120 metres b. 180 metres c. 324 metres d. 150 metres **(Ans: d.)**

Solution: Speed = 60 km/hr = (60 × 5 / 18) m/sec = (50 / 3) m/sec

Length of the train = (Speed x Time) = (50/3 × 9) m = 150 m.

3. A train 100 m long is running at the speed of 30 km/hr. Find the time taken by the train to pass a man standing near the railway line.

a. 3 b. 10 c. 12 d. 15 **(Ans: c.)**

Solution: Speed=30 x 5 /18 = 25 / 3 m/sec

Time = d / v = 3 x 100 / 25 = 12 sec

4. A train 110 m long is running at the speed of 132 km/hr. Find the time taken by the train to pass a platform of length 165 m.

a. 7 ½ sec b. 8 c. 9 d. 7 **(Ans: a.)**

Solution: Speed = v =132 x 5 / 18 = 110 / 3 m/s

Distance = D =110 + 165 = 275 m

Time = d / v = 7 ½ sec

5. A 150 m long train is running with a speed of 68 km/hr. In what time will it pass a man who is running at 8 km/hr, in the same direction?

a. 10 b. 12 c. 9 d. 8 **(Ans: c.)**

Solution: Relative speed of train = 68 – 8 = 60 km/hr = 60 x 5/18 = 50/3 m/s

Time = D / v = 150 x 3 / 50 = 9 sec

6. A 220 m long train is running with a speed of 59 km/hr. In what time will it pass a man who is running at 7 km/hr, in the opposite direction of the train?

a. 10sec b. 12sec c. 9sec d. None **(Ans: b.)**

Solution: Relative speed of train = 59 + 7 = 66 km/hr = 66 x 5/18 = 55/3 m/s

Time = D/v = 220 x 3/55 = 12sec

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

a. 45 km/hour b. 50 km/hour c. 54 km/hour d. 55 km/hour **(Ans: b.)**

Solution: Speed of the train relative to man = (125/10) m/sec = (25/2) m/seconds

[(25/2) × (3600/1000] km/hour = 45 km/hour

Let the speed of the train be x km/hour.

Speed of man =5

Then, relative speed = (x - 5) km/hour; x - 5 = 45 => x = 50 km/hour

8. 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:

a. 1 : 3 b. 3 : 2 c. 3 : 4 d. None of these **(Ans: b.)**

Solution: Let the speeds of the two trains be x m/second and y m/second respectively.

Then, length of the first train = 27 x meters, and

length of the second train = 17 y meters.

(27 x + 17 y) ÷ (x + y) = 23

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

= 4 x = 6 y

= x/y = 3/2 or 3 : 2

9. 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/hour, what is the length of the platform?

a. 120 metres b. 240 metres c. 300 metres d. None of these **(Ans: b.)**

Solution: Speed = (54 × 5 / 18) m/second = 15 m/second

Length of the train = (15 x 20) m = 300 m.

Let the length of the platform be x meters.

Then, (x + 300) / 36 = 15

= x + 300 = 540; x = 240 m.

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

a. 150 metres b. 200 metres c. 350 metres d. 400 metres **(Ans: c.)**

Solution: Speed = [300 / 18] m/second = 50/3 m/second

Let the length of the platform be x meters.

Then, x + 300 / 39 = 50/3

3 (x + 300) = 1950

x = 350 m.

11. A train crosses a platform of 120 metres in 15 second, same train crosses another platform of length 180 metres in 18 second, then find the length of the train?

a. 175 metres b. 180 metres c. 185 metres d. 170 metres **(Ans: b.)**

Solution: Length of the train be 'X'

X + 120/15 = X + 180/18

6X + 720 = 5X + 900

X = 180 m

12. A train 400 m long can cross an electric pole in 20 second and then find the speed of the train?

a. 65 km/ hour b. 70 km/ hour c.72 km/ hour d. 75 km/ hour **(Ans: c.)**

Solution: Length = Speed × time

Speed = Length/ Time

S = 400/ 20

S = 20 M/Second

Speed= 20 × 18/5 (To convert M/Second in to Km/ hour multiply by 18/5)

Speed = 72 Km/ hour.

13. Two trains of length 100 m and 120 m running in same directions with a speed of 72 km/hr and 54 km/hr in how much time will the first train cross the second?

a. 40 b. 42 c. 44 d. None **(Ans: c.)**

Solution: Relative speed = 72 – 54 =18km/hr =18 x 5/18 = 5 m/s

Total distance covered =100+120=220

Time = 220 / 5 = 44 sec

14. The two trains of lengths 400 metres, 600 metres respectively, running at same directions. The faster train can cross the slower train in 180 second, the speed of the slower train is 48 km., then find the speed of the faster train?

a. 58 km/ hour b. 68 km/ hour c. 78 km/ hour d. 55 km/ hour **(Ans: b.)**

Solution: Length of the two trains = 600 metres + 400 metres = 1000m = 1 km

Time required = 180 sec = 180 / 3600 hr = 1 / 20 hr.

Speed of the first train = X

Time = Distance / Speed

Speed of the second train= 48 Km/ hour

=> 1 / 20 = 1 / (x – 48); X = 68km/hr

15. Two stations A and B are 110 km apart on a straight line. One train starts from A at 7 a.m. and travels towards B at 20 km/ hour. Another train starts from B at 8 a.m. and travels towards A at a speed of 25 km/ hour. At what time will they meet?

a. 9 a.m. b. 10 a.m. c. 10.30 a.m. d. 11 a.m. **(Ans: b.)**

Solution: Suppose they meet x hours after 7 a.m.

Distance covered by A in x hours = 20x km.

Distance covered by B in (x - 1) hours = 25(x - 1) km.

Therefore 20x + 25(x - 1) = 110

45x = 135; x = 3. So, they meet at 10 a.m.

16. A 125 m long train is running at 45 km/h. In how much time will it cross an electric pole?

a. 12 s b. 8 s c. 10 s d. 15 s **(Ans: c.)**

Solution: Length of the train = 125 m

Speed of the train = 45 km/h = 45 × 5/18 = 12.5 m/s

Time = 125 / 12.5 = 10 s

17. A 375 m long train is running at 72 km/h. In how much time will it cross a tunnel 225 m long?

a. 38 s b. 34 s c. 36 s d. 30 s **(Ans: d.)**

Solution: Length of the train = 375 m

Speed = 72 km/h = 72 × 5 / 18 = 20 m/s

Distance = length of train + length of tunnel = 375 + 225 =600 m

Time = 600 / 20 = 30 s

CHAPTER 17 - BOATS AND STREAMS

Boats and Streams: The two fundamental concepts in the Boats and Streams Aptitude Quiz are upstream and downstream. These questions are based on the principle of relative speed and are used to calculate the speed of a boat or a stream in still water, given the speed of the boat in the downstream or upstream direction.

Important terms:

Stream: Moving water in a river or any other water body.

Upstream: Moving against the direction of the stream or current.

Downstream: Moving along the direction of the stream or current.

Still Water: Water in a river or any other water body that is not flowing or stationary.

Boats and Streams Formula:

Speed Upstream = U-V km/ hour=B

Speed Downstream = U+V km / hour=A

U=Speed of the boat in still water

V=Speed of the stream

Speed of boat in still water $= \frac{1}{2} \times (A + B)$ km / hour

Rate of stream $= \frac{1}{2} \times (A - B)$ km/hour

1. The speed of a boat when travelling downstream is 32 km/h were as when travelling upstream is 28 km/h. What is the speed of the boat in still water in speed of the stream?

Solution: Speed of boat in still water $= \frac{1}{2} \times (A + B) = 30$ km/h

Speed of stream $= \frac{1}{2} \times (A - B) = 2$ km/h

2. A man takes 3 hours 45 minutes to row the boat 15 km downstream of a river and 2 hours 30 minutes to cover a distance of 5 km upstream. Find speed of river current in km/h.

Solution: Speed of downstream = 15/3hrs 45min = 4km/h

Speed of upstream = 5/2hrs 30min = 2km/h

Speed of current/stream = $\frac{1}{2} \times (A - B)$ = 1km/h.

3. A Man can row 6km/h in still water, takes him twice as long to row up to row down the river. Find the rate of the stream.

Solution: Let man's way upstream = b = x km/h

Rate downstream = a = 2x km/h

Rate in still water = $\frac{1}{2} \times (a + b) = 6$ x = 4

Speed of rate of upstream = b = x = 4

Speed of stream = a = 2x = 8 km/h

Rate of stream = $\frac{1}{2} \times (A - B)$ = 2 km/h

4. A man can row 7.5 km/h in still water. I f in a river 1.5 km an hour, it takes him 50 min to row to a place and back, how far off is the place.

Solution: Speed of downstream = U + V = 9 km/h = 7.5 + 1.5

Speed of upstream = U – V = 6 km/h = 7.5 - 1.5

Let the distance = x km

Time = 50 min

$\frac{x}{9} + \frac{x}{6} = \frac{50}{60}$ => x = 3

Required distance=3 km

5. A man goes 18 km downstream, in 4 hours and returns against the stream in 12 hours. Find the speed of stream in km/hr.

Solution: Speed downstream = $\frac{18}{4} = \frac{9}{2} = a$

Speed upstream = $\frac{18}{12} = \frac{3}{2} = b$

Speed of stream = $\frac{1}{2} \times (A - B) = \frac{3}{2}$

6. A man swimming in a stream which flows 1.5 km. Find that in a given time he can swim twice as for with a stream as he can against it at what rate does he swim.

Solution: Speed of upstream be x=B

Speed of downstream be 2x=A

Speed of the man=$\frac{1}{2} \times (A + B)$

Speed of the stream=$\frac{1}{2} \times (A - B) = \frac{x}{2}$

Given that speed of stream=1.5 km/h = $\frac{3}{2}$

$\frac{x}{2} = \frac{3}{2}$; x = 3

Speed of upstream = x = 3 = B

Speed of downstream=2x=6=A

Speed of man = $\frac{1}{2} \times (A + B)$ = 4.5 km/h

7. If a boat 7 km upstream in 42 min and the speed of the stream is 3km/h. Then what is the speed of the boat in still water.

Solution: 42 min = $\frac{42}{60}$ h = $\frac{7}{10}$ h

Speed of the stream = 3 km/h

Speed of still water = x

Upstream speed = U - V = x - 3 = 10 = X = 13km/h.

8. A man's speed with the current is 15km/h and speed of the current is 2.5 km/h. What is the man's speed against the current?

Solution: Man's speed in still water = u - v = 15 - 2.5 = 12.5 km

Man's speed against the current = 12.5 - 2.5 = 10 km/h.

9. A man can row upstream at 7 km/h and downstream at 10 km/h. Find man's rate in still water and the rate of current.

Solution: Rate in still water = $\frac{1}{2}$ (10 + 7) km/h = 8.5 km/h

Rate of current = $\frac{1}{2}$ (10 − 7) km/h = 1.5 km/h

10. A man can row 18 kmph in still water, it takes him thrice as long to row up as to row down the river. Find the rate of stream.

Solution: Let man's rate of upstream be x km/h,

His rate of downstream = 3x km/h.

So, $2x = 18 \; or \; x = 9$

Rate of` upstream = 9km/h,

Rate of downstream = 27km/h

Rate of stream = $\frac{1}{2}(27 - 9) = 9$ km/hr.

11. A boatman can row a boat upstream at 14 km/ hour and downstream at 20 km/ hour. Find the speed of the boat in still water and the speed of the stream.

Solution: Speed downstream, D = 20 km / hour

Speed upstream, U = 14 km / hour

Therefore, Speed of boat in still water = 0.5 x (D + U) km / hour

= 0.5 x (14 + 20) = 17 km / hour.

Also, speed of the stream = 0.5 x (D – U) km / hour = 0.5 x (20 – 14) = 3 km / hour.

12. A boatman can row a boat at the speed of 5 km upstream and 15 km downstream. To cover upstream he needs 2.5 hours and to cover downstream, he needs 10 hours. Find the speed of the stream and the speed of the boat in still water.

Solution: The boatman covers 5 km upstream in 2.5 hours and 15 km downstream in 10 hours.

Speed upstream, U = 5 / 2.5 = 2 km / hour

Speed downstream, D = 15 / 1.5 = 10 km / hour

Therefore, Speed of boat in still water = 0.5 x (D + U) km / hour

= 0.5 x (10 + 2) = 6 km / hour

Also, speed of the stream = 0.5 x (D – U) km / hour = 0.5 x (10 – 2) = 4 km / hour

13. A man has to go from a port to an island and return. He can row a boat with a speed of 7 km/ hour in still water. The speed of the stream is 2 km/hour. If he takes 56 minutes to complete the round trip, find the distance between the port and the island.

Solution: Speed upstream = 7 – 2 = 5 km / hour

Speed downstream = 7 + 2 = 9 km / hour

Let the distance between the port and the island be D km.

Also, we know that Time = Distance / Speed = (D/5) + (D/9) = 56/60

= (14 D) / 45 = 56 / 60; D = 3 km;

Therefore, the distance between the port and the island = 3 km.

14. In a boat race, a person rows a boat 6 km upstream and returns to the starting point in 4 hours. If the speed of the stream is 2 km/hour, find the speed of the boat in still water.

Solution: Let the speed of the boat in still water be B km/ hour

Speed upstream = (B – 2) km/ hour

Speed downstream = (B + 2) km / hour

We know that, Time = Distance / Speed = 6 / (B - 2) + 6 / (B + 2) = 4

= 6 B + 12 + 6 B – 12 = 4 (B – 2) (B + 2)

= 12 B = 4 (B – 2) (B + 2)

= 3 B = B^2 – 4

= B^2 – 3 B – 4 = 0

= (B + 1) (B – 4) = 0

= B = 4 km/ hour (Speed cannot be negative).

15. A racer can row a boat 30 km upstream and 44 km downstream in 10 hours. Also, he can row 40 km upstream and 55 km downstream in 13 hours. Find the speed of the boat in still water and the speed of the stream.

Solution: Let the speed upstream be U km/hour and the speed downstream be D km/hour

We know that, Distance / Speed = Time

= (30 / U) + (44 / D) = 10 and (40 / U) + (55 / D) = 13

Solving the above pair of linear equations, we get D = 11 km/ hour U = 5 km/ hour.

Therefore, Speed of boat in still water = 0.5 x (D + U) km / hour = 0.5 x (11 + 5) = 8 km / hour

Also, speed of the stream = 0.5 x (D – U) km / hour = 0.5 x (11 – 5) = 3 km / hour

16. A man can row upstream at 8 km/h and downstream at 14 km/h. Find the man's speed in still water and the speed of current?

Solution: Speed of upstream = 8 km/h & speed of downstream = 14 km/h

Speed in still water $= \frac{1}{2}(8 + 14) = 11\ km/h$

Speed of current $= \frac{1}{2}(14 - 8) = 3\ km/h$

17. A boat running down stream covers a distance of 12 km in 2 hours while covering for the same distance upstream it takes 3 hours. What is the speed of the boat in still water?

Solution: Downstream speed = 12/2 km/h = 6 km/h

Upstream speed = 12/3 km/h = 4 km/h

Speed in Still water $= \frac{1}{2}(6 + 4) = 5\ km/h$

Chapter 18 – Permutation and Combination

Formula: $nP_r = \frac{n!}{(n-r)!}$, $nC_r = \frac{n!}{r!(n-r)!}$

Difference between Permutation and Combination	
Permutation	**Combination**
The different ways of arranging a set of objects into a sequential order are termed as Permutation.	One of the several ways of choosing items from a large set of objects, without considering an order is termed as Combination.
The order is very relevant.	The order is quite irrelevant.
It denotes the arrangement of objects.	It does not denote the arrangement of objects.
Multiple permutations can be derived from a single combination.	From a single permutation, only a single combination can be derived.
They can simply be defined as ordered elements.	They can simply be defined as unordered sets.

1. Find the value of $5P_5 + 10C_3 + 60C_{60}$

a. 240 b. 120 c. 241 d. 360 **(Ans: c.)**

Solution: 5! + 120 + 1 = 241

2. In how many different ways can the letters of the word 'FIGHT' be arranged?

a. 50 b. 5 c. 120 d. 4 **(Ans: c.)**

Solution: 5! = 120

3. In how many different ways can the letters of the word 'PRESENT' be arranged?

a. 2520 b. 7 c. 2250 d.2025 **(Ans: c.)**

Solution: $7! / 2 = 2520$

4. How many arrangements can be made out of the letters of the word 'MATHEMATICS'?

a. $\frac{11!}{2!\,2!\,2!}$ b. $\frac{10!}{2!\,2!\,2!}$ c. $\frac{11!}{2!\,2!}$ d. $\frac{12!}{2!\,2!}$ **(Ans: a.)**

Solution: $\frac{11!}{2! \times 2! \times 2!}$

5. In how many ways can a cricket team of eleven be chosen out of 14 players?

a. 634 b. 364 c. 346 d. 463 **(Ans: b.)**

Solution: $14\,C_{11} = 14\,C_3 = 364$

6. In how many ways can 5 girls can be a seated in a bench?

a. 120 b. 5 c. 6 d. 20 **(Ans: a.)**

Solution: $5! = 120$

7. In how many ways, a committee of 6 members be selected from 7 men and 5 ladies, consisting of 4 men and 2 ladies?

a. 530 b. 350 c. 503 d. 305 **(Ans: b.)**

Solution: $7C_4 \times 5C_2 = 35 \times 10 = 350$

8. 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?

a. 45 b. 63 c. 90 d. 126 **(Ans: b.)**

Solution: $7C_5 \times 3C_2 = 21 \times 3 = 63$

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

a. 25200 b. 52000 c. 120 d. 24400 **(Ans: a.)**

Solution: Number of ways of selecting (3 consonants out of 7) and (2 vowels out of 4)

$= (7C_3 \times 4C_2) = 210.$

Number of groups, each having 3 consonants and 2 vowels = 210.

Each group contains 5 letters.

Number of ways of arranging 5 letters among themselves = 5! = 120.

Required number of ways = (210 x 120) = 25200.

10. A committee of 5 persons is to be formed from 6 men and 4 women. In how many ways can this be done when at least 2 women are included?

a. 196 b. 186 c. 190 d. 200 **(Ans: b.)**

Solution: When at least 2 women are included.

The committee may consist of 3 women, 2 men: It can be done in $4C_3 \times 6C_2$ ways

or, 4 women, 1 man: It can be done in $4C_4 \times 6C_1$ ways

or, 2 women, 3 men: It can be done in $4C_2 \times 6C_3$ ways.

Total number of ways of forming the committees

$= (4C_2 \times 6C_3) + (4C_3 \times 6C_2) + (4C_4 \times 6C_1) = (6 \times 20) + (4 \times 15) + (1 \times 6)$

$= 120 + 60 + 6 = 186.$

11. A college has 10 basketball players. A 5-member team and a captain will be selected out of these 10 players. How many different selections can be made?

a. 1260 b. 1400 c. 1250 d. 1600 **(Ans: a.)**

Solution: A team of 6 members has to be selected from the 10 players.

This can be done in $^{10}C_6$ or 210 ways.

Now, the captain can be selected from these 6 players in 6 ways.

Therefore, total ways the selection can be made is $210 \times 6 = 1260$

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

a. 360 b. 700 c. 720 d. 120 (Ans: c.)

Solution: The word 'OPTICAL' contains 7 different letters.

When the vowels OIA are always together, they can be supposed to form one letter.

Then, we have to arrange the letters PTCL (OIA).

Now, 5 letters can be arranged in 5! = 120 ways.

The vowels (OIA) can be arranged among themselves in 3! = 6 ways.

Required number of ways = (120 x 6) = 720.

13. 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?

a. 4050 b. 3600 c. 1200 d. 5040 **(Ans: d.)**

Solution: 'LOGARITHMS' contains 10 different letters.

Required number of words = Number of arrangements of 10 letters, taking 4 at a time.

$$10P_4 = 5040$$

14. How many integers, greater than 999 but not greater than 4000, can be formed with the digits 0, 1, 2, 3 and 4, if repetition of digits is allowed?

a. 376 b. 375 c. 500 d. 673 **(Ans: a.)**

Solution: First, we find the no. of numbers from is 1000 to 3999.

Thousands place can be filled by any of the 4 digits (1, 2, 3) in 3 ways

Hundreds, tens and units place) be filled in 5 ways each.

Hence, there are 3 x 5 x 5 x 5 or 375 numbers from 1000 to 3999.

Including 4000, there will be 376 such numbers.

15. The Indian Cricket team consists of 16 players. It includes 2 wicket keepers and 5 bowlers. In how many ways can a cricket eleven be selected if we have to select 1 wicket keeper and at least 4 bowlers?

a. 1024 b. 1900 c. 2000 d. 1092 **(Ans: d.)**

Solution: We are to choose 11 players including 1 wicket keeper and 4 bowlers or, 1 wicket keeper and 5 bowlers.

Number of ways of selecting 1 wicket keeper, 4 bowlers and 6 other players in

$$2C_1 \times 5C_4 \times 9C_6 = 840$$

Number of ways of selecting 1 wicket keeper, 5 bowlers and 5 other players in

$$2C_1 \times 5C_5 \times 9C_5 = 252$$

Total number of ways of selecting the team = 840 + 252 = 1092

16. An automobile dealer provides cars in 5 models in 6 different colors. Find the number of choices open to a customer?

a. 30 b. 11 c. 15 d. 21 **(Ans: a.)**

Solution: We have to choose 1 out of 5 models and 1 color from 6 colors.

Total number of selections = 5 X 6 = 30.

17. In how many ways can 3 prizes be distributed among 4 boys when a boy may get any number of prizes?

a. 24 b. 16 c. 64 d. 46 **(Ans: c.)**

Solution: First prize can be distributed among any one of the 4 boys, second prize can be distributed among any one of the 4 boys, third prize can be distributed among any one of the 4 boys.

Total number of ways = 4 X 4 X 4 = 64.

Quantitative Aptitude

Chapter 19 – Probability

1. Let S be the sample space and let E be an event. Then P(E) = $n(E) / n(S)$

2. In tossing a coin, S = {H,T}

3. If two coins are tossed, then S = {HH, HT, TH, TT}

4. In rolling a dice, we have, S = {1, 2, 3, 4, 5,6}

5. A pack of cards of each cards have 52 cards.

6. It has 13 cards of each suit, namely Spades, Clubs, Hearts and Diamonds.

7. Cards of Spades and Clubs are black cards.

8. Cards of Hearts and Diamonds are red cards.

9. There are 4 honours of each suit.

10. These are Aces, Kings, Queens and Jacks.

11. These are called face cards.

Questions:

1. In a throw of a coin, find the probability of getting a head.

a.1 / 2 b. 1 / 3 c. 2 / 3 d. 1 / 4 **(Ans: a.)**

Solution: Number of outcomes for 1 coin = {H,T} =2

Event of getting head = {H} = 1

Probability of getting head = ½

2. Two unbiased coins are tossed. What is the probability of getting at most one head?

a. ½ b. ¾ c. ¼ d.1/6 **(Ans: b.)**

Solution: Number of outcomes for 2 coins = {HH, TT, HT, TH} = 2X2 =4

Event of getting at most 1 head = (HH, HT, TH} = 3

Probability of getting at most 1 head = 3/4

3. An unbiased die is tossed. Find the probability of getting multiple of 3.

a) 2/3 b. ½ c. 1/3 d. 1 **(Ans: c.)**

Solution: Number of outcomes for 1 die =6

Event of getting multiples of 3 = {3, 6} = 2

Probability of getting multiples of 3 = 2/6 = 1/3

4. In a simultaneous throw of a pair of dice, find the probability of getting a total more than 7.

a. 5/12 b. 4/12 c. 7/12 d. 10/12 **(Ans: a.)**

Solution: Number of outcomes for 2 dice = 6X6 =36

Event of getting a total more than 7 = {(2,6)(6,2),(3,5),(5,3),(4,4),(5,4),(4,5),(3,6),(6,3),(5,5),(6,4),(4,6),(5,6),(6,5),(6,6)} = 5

Probability of getting a total more than 7 = 15/36 = 5/12

5. A bag contains 6 white and 4 black balls. Two balls are drawn at random. Find the probability that they are of the same colour.

a. 1/15 b. 2/15 c. 5/15 d. 7/15 **(Ans: d)**

Solution: Number of outcomes for selecting two from 10 balls (6 white+4 black)

$$10C_2 = \frac{10\times9}{2\times1} = 45$$

Event of drawing two balls of same color = 2 white or two black

$$= 6C_2 + 4C_2$$

$$= \frac{6\times5}{2\times1} + \frac{4\times3}{2\times1} = 15 + 6 = 21$$

Probability of getting drawing two balls of same color = 21/45 = 7/15

6. In a simultaneous throw of two coins, the probability of getting at least one head is

a. ½ b. 1/3 c. 2/3 d. ¾ **(Ans: d.)**

Solution: Number of outcomes for 2 coins = 2X 2 =4

Event of getting at least 1 head = {(H,T), (T,H), (H,H)} =3

Probability of getting at least 1 head = ¾

7. In a single throw of a die, what is the probability of getting a number greater than 4?

a. ½ b. 1/3 c. 2/3 d. ¼ **(Ans: b.)**

Solution: Number of outcomes for I die =6

Event of getting a number greater than 4 = {5, 6} =2

Probability of getting a number greater than 4 = 2/6 = 1/3

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

a. ½ b. ¾ c. 3/8 d. 5/16 **(Ans: b.)**

Solution: Number of outcomes for 2 dice = 6X6=36

Event of getting a product of two numbers is even = {(2,1),(1,2),(2,2),(1,4),(4,1),(6,1),(1,6),(2,3),(3,2),(2,4),(4,2),(2,5),(5,2),(2,6),(6,2), (4,3),(3,4), (4,4), (3,6),(6,3),(4,5),(5,4),(4,6),(6,4),(5,6),(6,5),(6,6)} = 27

Probability of getting a product of two numbers is even = 27/36 = ¾

9. A card is drawn from a pack of 52 cards. The probability of getting a queen of club or king of heart is

a. 1/13 b. 2/13 c. 1/26 d. 1/52 **(Ans: c.)**

Solution: Number of outcomes for selecting 1 card = $52C_1 = 52$

Event of drawing a king of heart or queen of club = 1+1 =2

Probability of drawing a king of heart or queen of club = 2/52 = 1/26

10. One card is drawn from a pack of 52 cards. What is the probability that the card drawn is either a red card or a king?

a. ½ b. 6/13 c. 7/13 d. 27/52 **(Ans: c)**

Solution: Number of outcomes for drawing a card = $52C_1 = 52$

Event of drawing a red card or king card = 26 + 4 - 2 = 28

[Out of 4 king cards, two red king cards and 2 black king cards]

Probability of drawing a red card or king card = 28/52 = 7/13

11. From a pack of 52 cards, one card is drawn at random. What is the probability that the card drawn is a ten or a spade?

a. 4/13 b. ¼ c. 1/13 d. 1/26 **(Ans: a.)**

Solution: Number of outcomes for drawing a card = $52C_1 = 52$

Event of drawing a ten or spade = $4 + 13 - 1 = 16$

[Ten cards = 4, Spade cards = 13 and ten and spade card =1}

Probability of drawing a ten or spade =16/52 = 4/13

12. 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?

a. ¾ b. 4/7 c. 3/7 d. 1/8 **(Ans: b.)**

Solution: Number of outcomes for selecting 1 ball = (6 black+8 white) = $14C_1 = 14$

Event of drawing 1 white ball = $8C_1 = 8$

Probability of drawing 1 white ball = 8/14 = 4/7

13. Two dice are thrown simultaneously. What is the probability of getting a total score of 7?

a. 1/6 b. ¾ c. 1/8 d. 2/3 **(Ans: a.)**

Solution: Number of outcomes for 2 dice =6X6 =36

Event of getting total of 7 = {(1,6), (6,1), (2,5), (5,2), (3,4),(4,3)} =6

Probability of getting a total of 7 = 6/36 = 1/6

14. A bag contains 5 green and 7 red balls. Two balls are drawn. Find the probability that one is green and the other is red.

a. 35/66 b. 33/66 c. ¾ d. ½ **(Ans: a.)**

Solution: Number of outcomes for selecting 2 balls = $12C_2 = \frac{12\times11}{2\times1} = 66$

Event of selecting one green and one white = $5C_1 \times 7C_1 = 5 \times 7 = 35$

Probability of selecting one green and one white = 35/66

15. When four fair dice are rolled simultaneously, in how many outcomes will at least one of the dice show 3?

a. 620 b. 671 c. 625 d. 567 **(Ans: b.)**

Solution: When 4 dice are rolled simultaneously,

There will be a total of 6 x 6 x 6 x 6 = 1296 outcomes.

The number of outcomes in which none of the 4 dice show 3 will be

5 x 5 x 5 x 5 = 625 outcomes.

Therefore, the number of outcomes in which at least one die will show 3

= 1296 – 625 = 671

16. Two dice are thrown at random. Find probability of getting same face numbers on both dice.

a. 1/3 b. 1/6 c. ¼ d. ½ **(Ans: b.)**

Solution: Number of outcomes for 2 dice = 6X6=36

Event of getting same numbers on two dice

={(1,1), (2,2), (3,3), (4,4), (5,5), (6,6)} = 6

Probability of getting same number on 2 dice = 6/36 = 1/6

17. Tickets are numbered from 1 to 100. They are well shuffled and a ticket is drawn at random. What is the probability that the drawn ticket has a square number.

a. 1/5 b. 1/10 c. 1/15 d. ½ **(Ans: b.)**

Solution: Number of outcomes for selecting I ticket = $100C_1 = 100$

Event of getting a ticket number which is a square.

= {1, 4, 9, 16, 25, 36, 49, 64. 81, 100} =10

∴ Probability of getting a square number = 10/100 = 1/10

18. If two unbiased dice are rolled together, what is the probability of getting different points?

a. 1/6 b. 5/6 c. 1/3 d. None **(Ans: b.)**

Solution: Number of outcomes for 2 dice =36

Event of getting a different number

= {(1,2), (1,3), (1,4), (1,5), (1,6), (6,1), (6,2), (6,3), (6,4), (6,5)} = 30

Probability of getting a different number = 30/36 = 5/6

19. In a single throw with two dice, find the probability of getting an even number on one die and multiple of 3 on other.

a. 1/6 b. 5/36 c. 11/36 d. None of these **(Ans: c.)**

Solution: Number of outcomes for 2 dice =36

Event of getting even number on one die and multiple of 3 on other

= {(2,3),(2,6),(4,3),(4,6),(6,3),(6,6),(3,2),(6,2),(3,4),(6,4),(6,3)} = 11

Probability of getting even number on one die and multiple of 3 on other = 11/36

20. If two unbiased dice are rolled together, what is the probability of getting difference of numbers is 2?

a. 13/36 b. 11/36 c. 19/36 d. 8/36 **(Ans: d.)**

Solution: Number of outcomes for 2 dice = 6X6=36

Event of getting difference of 2 points = {(1,3), (3,1), (2,4), (4,2), (3,5), (5,3), (6,4), (4,6)} = $\frac{8}{36}$

Probability of getting difference of 2 points = 8/36 =2/9

Unit IV: Analytical Ability

Chapter 1: English Grammar

I. Choose the right answers from the options given.

1. Please, stop _____ so many mistakes.

a. To make b. make c. making d. makes **(Ans: c. making)**

2. I don't really know how to _____ the problem.

a. Tackle b. Cope c. Draw d. Erase **(a. Tackle)**

3. Ravi behaves strangely at times and, therefore, nobody gets _____ with him.

a. About b. Through c. Along d. Up **(Ans: c. Along)**

4. _____ birds, can we fly.

a. Before b. Like c. As d. Without **(Ans: c. As)**

5. How _____ money do you have in your pocket?

a. Many b. Few c. Much d. Some **(Ans: c. Much)**

6. There are two brothers but _____ of them is hardworking.

a. either b. neither c. none d. every **(Ans: b. Neither)**

7. That is _____ interesting book.

a. Have b. A c. An d. None of the above **(Ans: c. An)**

8. Which of the following sentences is in the present perfect tense?

a. I will go to the store later. b. I went to the store yesterday

c. I have gone to the store many times d. I am going to the store now. **(Ans: c. I have gone to the store many times).**

9. You didn't see that movie, _____?

a. Did You? b. Didn't You? c. Do you? d. Will You? **(Ans: a. Did You?)**

10. Explain how you would describe _____ in five years' time.

a. You b. Your c. Yours d. Yourself **(Ans: d. Yourself)**

Chapter 2: Under Verbal Ability

1. Light : Blind :: _____ : _____.

a. Speech : Dumb, b. Language : Deaf c. Tongue : Sound

d. Voice : Vibration (Ans: a. Speech : Dumb)

Explanation: Blind is related to light. Speech is related to dumb

2. Pain : Sedative :: _____ : _____.

a. Comfort : Stimulant b. Grief : Consolation c. Trance : Narcotic

d. Ache : Extraction (Ans: b. Grief : Consolation).

Explanation: Sedative relieves pain. Consolation relieves grief.

3. Mundane : Spiritual :: _____ : _____.

a. Common : Ghostly b. Worldly : Unworldly c. Routine : Novel

d. Secular : Clerical (Ans: b. Worldly : Unworldly)

Explanation: Spiritual concerns with spirit or soul (not existence-unworldly). Mundane = existence(worldly).

4. Hope : Aspires :: _____ : _____.

a. Love : Elevates b. Film : Flam c. Fib : Lie

d. Fake : Ordinary (Ans: c. Fib : Lie)

Explanation: Fib means a small lie; very minor thing similarly hope means aspiring (want or desire) something.

5. Army : Logistics :: _____ : _____.

a. Business : Strategy b. Soldier : Students c. War : Logic

d. Team : Individual (Ans: a. Business : Strategy)

Explanation: Army optimize their operations through logistics and Business get maximum output through Good Strategy.

6. Symphony : Composer :: _____ : _____.

a. Leonardo : Music b. Fresco : Painter c. Colours : Pallet

d. Art : Appreciation (Ans: b. Fresco : Painter)

Explanation: Composer composes music, so painter paints Fresco.

7. Paw : Cat :: Hoof : _____.

a. Donkey b. Lion c. Elephant d. Horse (Ans: d)

Explanation: The cat's foot is called a paw. The horse's foot is called a hoof.

8. Exhibit : Display :: Send : _____.

a. Stamp b. Receive c. Show d. Emit (Ans: d)

Explanation: Both the words are synonyms.

9. Kolkata : Mumbai :: Mangalore : _____.

a. Hyderabad b. Delhi c. Cochin d. Jaipur (Ans: c)

Explanation: All port cities of India

10. Yard is to Fence as Cell is to _____.

a. Mitochondria b. Cytoplasm c. Membrane

d. Nucleus (Ans: c)

Explanation: Fence protects the Yard & Membrane protects the Cell.

11. Transition : Change :: Immobility : _____.

a. Stillness b. Liveliness c. Action d. Busyness (Ans: a)

Explanation: Both the words are synonyms.

12. Develop is to Assess as Train is to _____.

a. Change b. Educate c. Analyze d. Recruit (Ans: c)

Explanation: When a product is Developed its performance is Assessed and when a person is Trained his performance is Analyzed

13. Bill : Law :: _____ : Insect.

a. Pupa b. Stage c. Larva d. Bird (Ans: c)

Explanation: A Bill turns into a Law as to Larva turns into Insect.

14. Fossil : Extinction :: Puddle : _____.

a. Wet b. Rain c. Lake d. Dry (Ans: b)

Explanation: Fossils are evidence of an Extinction; Puddles are evidence of Rain.

15. Man : Biography :: Nation : _____.

a. History b. Leader c. Story d. Nationalism (Ans: a)

Explanation: Detailed description of a man's life is Biography, detailed description of a Nation is called History.

Chapter 3: Sentences

A. Sentence Completion

1. Some verb needs a _____ to convey the full.

a. Complimentary b. Complement c. Component d. Compliment (Ans: b.)

2. She set up the institutions of international _____.

a. Repute b. Renown c. Famous d. Reputation (Ans: c.)

3. The police have _____ a complaint against four persons.

a. Entered b. Lodged c. Registered d. Noted (Ans: c.)

4. He is too _____ to be deceived easily.

a. Strong b. Modern c. Kind d. Intelligent (Ans: d.)

5. You must _____ your career with all seriousness.

a. Direct b. Complete c. Follow d. Pursue (Ans: d.)

B) Sentence Improvement – A sentence /a part of the sentence is underlined. Below are given alternatives to the underlined part which may improve the sentence. Choose the correct alternative. In case no improvement is needed choose 'No improvement.'

1. The main part of **his speech** was well understood.

a. That he spoke b. in the speech of his
c. made when he spoke d. no improvement.

Ans. d.

2. He plays cricket and tennis **also**.

a. Both. b. besides c. too d. No improvement

Ans. c.

3. Old habits **die hardly**.

a. Die much hardly b. die-hard c. die too hard
d. No improvement

Ans. b.

4. They have stopped **from constructing** new buildings.

a. to construct b. at constructing c. constructing
d. No improvement

Ans.

5. I **think in my opinion** that all those who claim to be honest are not so.

a. In my opinion, I believe
b. It seems to me
c. It is my believing
d. No improvement.

Ans. a.

Chapter 4 :- SPOT THE ERROR

1. The spectacles is missing. (Incorrect)
   The spectacles are missing. (Correct)
   Certain nouns take the plural verb because of their plural form.
   Example: Clothes, Scissors, trousers, amends, spectacles, thanks.

2. One must help his siblings. (Incorrect)
   One must help one's siblings. (Correct)
   When the pronoun 'one' is used, it should be maintained throughout the whole sentence.

3. It's a bit early, is it? (Incorrect)
   It's a bit early, isn't it? (Correct)
   Sentences are always opposite to question tags, for example, if the question tag is positive then the sentence is negative and vice versa.

4. These are the best which he could get. (Incorrect)
   These are the best that he could get. (Correct)
   Instead of 'who' or 'which', the relative pronoun 'that' is used after adjectives in the superlative degree.

5. I can write as fast, if not faster than her. (Incorrect)
   I can write as fast as, if not faster than her. (Correct)
   'As' is used both before and after the adjective to show equality.

6. I will be there in a hour. (Incorrect)
   I will be there in an hour. (Correct)
   In articles, the words starting with vowel sounds are preceded with 'An'. Hour is pronounced as 'our'. Hence, it becomes an hour.

7. Would you like to have some desert? (Incorrect)
   Would you like to have some dessert? (Correct)
   When the word 'desert' is used to refer to a land filled with sand, then it's used as a noun, but when it's used to refer to abandonment, it's used as a verb. On the other hand, the word 'dessert' simply refers to a sweet dish that people enjoy after meals.

8. Divide the apple between you three. (Incorrect)
   Divide the apple among you three. (Correct)
   'Among' is used when something is with a group of a few, several, or many things. The use of 'between' is when something is in the middle of two things or two groups of things.

9. People has left. (Incorrect)
People have left. (Correct)
Certain nouns being a singular form represent plurality and therefore, take a plural verb in a sentence.

Example: police, clergy, people, peasantry, cattle.

10. Unless you do not pay the fine, you will not be excused. (Incorrect)
Unless you pay the fine, you will not be excused. (Correct)
'Not' is never used with 'unless' as 'unless' expresses a condition that is always used in the negative sense.

Chapter 5 : PASSAGES

1. Directions: Read the passage carefully and answer the questions given below:

Working women, who are earning cash and having access to mobile phones, perpetrate more spousal violence on husbands in India, revealed research conducted by health experts at the International Institute for Population Sciences (IIPS), Mumbai. This could be for several reasons. "For instance, as women gain economic autonomy, men may feel that their masculinities are being challenged, and may indulge in controlling wife, or indulging in alcoholic behaviour, leading to experience of spousal violence by cash-earning women," according to the research titled 'Prevalence and risk factors of physical violence against husbands: evidence from India' (2023), published by Cambridge University Press.

The research was conducted by Aparajita Chattopadhyay, Deepanjali Vishwakarma, Suresh Jungari (all IIPS), and Santosh Kumar Sharma (The George Institute for Global Health, New Delhi). They observed that 'access to mobile phones helps empower women, and this could be a threat to a husband, leading to restricting wife in communication, leading to spousal violence'. With the tremendous increase in mobile usage, they found that 'improved social network of a wife, who gets support to indulge in violent acts for varying reasons, reporting of husband's behavioural traits to peers or relatives though mobile phones by wife, exposure to violent media content, could be possible reasons for perpetration of violence of women on men'.

A stirring finding of the study was that with increase in wife's age, spousal violence on husband increased. Older women gained authority with age, leading to more violence on husbands with increasing age of wife. It revealed that in India, spousal violence against men stands at 29 per 1,000. The proportion of currently married women committing spousal violence against their husband varied from 2 per 1,000 in Sikkim to 90 per 1,000 in Tamil Nadu in NFHS-4. It was observed that the prevalence of spousal violence against husbands increased rapidly in the majority of the States, except Sikkim, Goa, and Mizoram, during 2005-06 to 2015-16.

The prevalence of violence against husband was higher in nuclear family (34/1,000) compared to non-nuclear family (28/1,000); higher among those who live in poorest household; who were exposed to TV (31.4/1,000), or working and getting paid in cash (43/1,000) than those who were not working.

The researchers noted that the prevalence of violence against husbands was higher among those women whose - husbands consumed alcohol (56.1/1,000), when women were afraid of their husbands (31.4/1,000), who had childhood exposure of parental violence (66.9/1,000), husbands displayed increasing marital control behaviour. Overall prevalence of violence was low in India as compared to other countries following low levels of reported violence against men, or societal pressure to prove masculinity, and remain silent about abuse for the fear of shame, and limited awareness.

1. Which of the following is not a reason for spousal violence on husbands in India?
   a. Economic freedom of women
   b. Threat on masculinity of men
   c. Women indulging in controlling her husband
   d. Alcoholic behaviour of men

Ans: c. Women indulging in controlling her husband

2. Spousal violence on husbands is more by-
   a. Working women
   b. Women having access to mobile phones
   c. Both the above
   d. None of the above

Ans: c. Both the above

3. Which of the following statement is correct:

I. Violence on husband increases with increase in women's age
II. Spousal violence is more among older women
   a. Only I is correct
   b. Only II is correct
   c. Both are correct
   d. None of the above is correct

Ans: b. Only II is correct

4. Which state has the lowest rate of spousal violence on men in India?
   a. Tamil Nadu
   b. Andhra Pradesh
   c. Rajasthan
   d. Sikkim

Ans: d. Sikkim

5. Prevalence of violence against husbands increased rapidly in-
   a. Sikkim
   b. Tamil Nadu
   c. Goa
   d. Mizoram

Ans: b. Tamil Nadu

6. What according to the author is the reason for low prevalence of violence against husbands in India as compared to other countries?
   a. Violence against men is not reported
   b. Societal pressure to prove masculinity
   c. Remain silent due to fear of shame
   d. All the above.

Ans: d. All the above

2. Read the passage carefully and answer the questions given below.

IT billionaire and Infosys founder NR Narayana Murthy recently remarked on the work culture in India and said that if India is to match up its better-developed peers in the world like China, Japan and Germany, the youth must consider working 70 hours a week. Murthy said, "India's work productivity is one of the lowest in the world. Unless we improve our work productivity, unless we reduce corruption in the government at some level, unless we reduce the delays in our bureaucracy in taking this decision, we will not be able to compete with those countries that have made tremendous progress. He added, "This is exactly what the Germans and Japanese did after the Second World War."

Dr. Bipeenchandra Bhamre, Consultant Cardiac Surgeon at Sir HN Reliance Foundation Hospital and Research Centre in Mumbai, shared, "As a cardiologist, I find Murthy's comment on the 70- day work week thought-provoking. Undoubtedly there are certain demanding fields/careers and the commitment of professionals to deliver their best is commendable. Busiest of us work 12 to 14 hours a day. However, it's crucial to strike a balance between dedication to our profession and the well-being of our own selves." The heart expert highlighted, "If you work in the field of your passion then working excessively long hours, such as a 70-hour work week, is not that stressful but if you are working in stressful environments can lead to burnout. In my opinion, we should focus on optimizing work hours, improving productivity and providing support systems to prevent burnout and ensure that both skilled and unskilled professionals can continue to deliver the best results in their

respective fields. It's about how well you utilise most productive years in your life. It's a choice."

Shilpi Saraswat, Clinical - Psychologist at Sakra World Hospital in Bengaluru, revealed, "Nowadays in our OPD, young people at the age range of 25-48 are getting referred from different departments due to underlying stress, anxiety and mental health problems. When we encounter the details about the work-life imbalance, lack of boundaries and long working hours without any break impact major health concerns. The spikes in blood pressure due to anxiety, stress is very common, many are asymptomatic as well and struggle with cardiovascular issues at very early stage."

She pointed out, "Commonly they have more anxiety problems and lack of skills to deal with bad stress. Most common disorders are GAD (generalised anxiety disorder), illness anxiety disorder, panic disorder, phobias etc. Long working hours put pressure and impacts quality of work and increase absenteeism at workplace which leads another issue for organisations as well as employees. The health concern is definitely raising due to stress which is increased due to long work hours poor support facilities and no work-life balance."

The mental health expert suggested the following precautions— Taking short break b/w work, Mindfulness relaxation, Stress management techniques, Increased workplace flexibility, Set boundaries at workplace, Enhance time management skills, Healthy diet, Healthy social support, Setting priorities for health, Start seeking help for mental health for improving yourself not your problem, Explore your me time, Follow simple basic routine, Set realistic short term goals.

1. Which of the following is not a reason mentioned by Mr. Murthy for lower work productivity in India?
   a. Lack of resources
   b. Corruption in government
   c. Delays in bureaucracy
   d. Less working hours

Ans: d. Less working hours

2. Which are the developed countries mentioned in the passage by Mr. Murthy?
   a. China & Japan
   b. USA & China
   c. China, Germany & Japan
   d. Germany, USA & Japan

Ans: c. China, Germany & Japan

3. What is the opinion of heart experts about the impact of long working hours on the employees?
   a. They are always stressful
   b. They are not stressful
   c. They are stressful if you work in your passionate field
   d. They are not stressful if you work in your passionate field.

Ans: c. They are stressful if you work in your passionate field

4. What should we balance our profession with, according to the cardiologists?
   a. Long working hours
   b. Well-being of our own selves
   c. Family
   d. Social life

Ans: b. Well-being of our own selves

5. Why employees suffer from anxiety and stress in a very young age?

I. Work-life balance
II. Cardiovascular issues
III. Long working hours
   a. Only I is correct
   b. Only II is correct
   c. I & II are correct
   d. I & III are correct

Ans: d. I & III are correct

6. What precautions are suggested by the health experts to reduce work stress?
   a. Adopt stress management techniques
   b. Improve time management skills
   c. Mindfulness relaxation
   d. All the above

Ans: d. All the above

3. Directions: Read the passage carefully and answer the questions given below:

Artificial Intelligence (AI) has emerged as one of the most transformative technologies of the 21st century, reshaping industries and influencing nearly every aspect of our daily lives. AI refers to the development of computer systems capable of performing tasks that typically require human intelligence,

such as problem-solving, learning, decision-making, and even creative thinking. Over the years, AI has made significant strides, and its impact on various sectors is undeniable.

AI's influence is especially evident in healthcare, where it aids in diagnosis, treatment, and drug discovery. Algorithms can analyze medical data more rapidly and accurately than humans, potentially saving lives and reducing healthcare costs. AI-powered robotics also play a crucial role in surgeries, making them less invasive and more precise.

In the field of finance, AI is revolutionizing how we manage and invest money. It powers chatbots for customer service, detects fraudulent transactions, and predicts market trends, aiding both consumers and financial institutions in making informed decisions. Another area where AI is creating waves is in autonomous vehicles. Self-driving cars, drones, and even ships rely on AI to navigate, avoid obstacles, and make decisions on the road or in the sky. These advancements promise to improve safety, reduce traffic congestion, and lower emissions.

AI-driven chatbots and virtual assistants are now commonplace in customer service and support. They provide quick and efficient responses to inquiries, enhancing customer satisfaction while reducing the workload on human support agents. In education, AI personalizes learning experiences by adapting content to individual student needs. It can assess a student's strengths and weaknesses and offer tailored lessons and practice materials, making education more accessible and effective.

However, the rapid integration of AI into society raises ethical and societal questions. Issues related to privacy, job displacement, and algorithmic bias demand careful consideration. As AI systems increasingly make critical decisions, transparency and accountability become essential.

1. How does AI impact the healthcare industry?
   a. It reduces the need for medical professionals.
   b. It improves the accuracy and speed of data analysis.
   c. It increases healthcare costs.
   d. It has no influence on healthcare.

Ans: b. It improves the accuracy and speed of data analysis.

2. In the financial sector, how does AI benefit both consumers and institutions?
   a. By predicting market trends
   b. By increasing fraudulent transactions

c. By reducing customer satisfaction
d. By promoting risky investments

Ans: a. By predicting market trends

3. Which industry is significantly affected by the use of AI-driven autonomous vehicles?
a. Agriculture
b. Manufacturing
c. Transportation
d. Education

Ans: c. Transportation

4. What is the role of AI in customer service and support?
a. Increasing the workload on human support agents
b. Reducing customer satisfaction
c. Providing quick and efficient responses to inquiries
d. Making customers wait for long periods

Ans: c. Providing quick and efficient responses to inquiries

5. What are some ethical concerns associated with the rapid integration of AI into society?
a. Increased transparency and accountability
b. Algorithmic bias, job displacement, and privacy issues
c. Enhanced societal harmony
d. AI-powered decision-making is flawless and unbiased.

Ans: b. Algorithmic bias, job displacement, and privacy issues

6. What role does AI play in the field of education?
a. It eliminates the need for teachers in classrooms.
b. It personalizes learning experiences and adapts content to individual student needs.
c. It standardizes education, making it the same for all students.
d. It increases the cost of education for students.

Ans: b. It personalizes learning experiences and adapts content to individual student needs.

4. Read the following passage carefully and answer the questions given below:

Story telling is not in our genes. Neither it is an evolutionary history. It is the essence of what makes us Human. Human beings progress by telling stories.

One event can result in a great variety of stories being told about it. Sometimes those stories differ greatly. Which stories are picked up and repeated and which ones are dropped and forgotten often determines how we progress. Our history, knowledge and understanding are all the collections of the few stories that survive. This includes the stories that we tell each other about the future. And how the future will turn out depends partly, possibly largely, on which stories we collectively choose to believe. Some stories are designed to spread fear and concern. This is because some story-tellers feel that there is a need to raise some tensions. Some stories are frightening, they are like totemic warnings: "Fail to act now and we are all doomed." Then there are stories that indicate that all will be fine so long as we leave everything up to a few especially able adults. Currently, this trend is being led by those who call themselves "rational optimists". They tend to claim that it is human nature to compete and to succeed and also to profit at the expense of others. The rational optimists however, do not realize how humanity has progressed overtime through amiable social networks and how large groups work in less selfishness and in the process accommodate rich and poor, high and low alike. This aspect in story-telling is considered by the 'Practical Possibles', who sit between those who say all is fine and cheerful and be individualistic in your approach to a successful future, and those who ordain pessimism and fear that we are doomed. What the future holds for us is which stories we hold on to and how we act on them.

1. Our knowledge is a collection of:
   a. all stories that we have heard during our life-time
   b. some stories that we remember
   c. a few stories that survive
   d. some important stories

Ans: c. a few stories that survive

2. Story telling is:
   a. an art
   b. a science
   c. in our genes
   d. the essence of what makes us human

Ans: d. the essence of what makes us human

3. How the future will turn out to be, depends upon the stories?
   a. We collectively choose to believe in
   b. Which are repeatedly narrated
   c. Designed to spread fear and tension

d. Designed to make prophecy

Ans: a. We collectively choose to believe in

4. Rational optimists:
I. Look for opportunities.
II. Are sensible and cheerful.
III. Are selfishly driven.
Identify the correct answer from the codes given below:
a. I, II & III
b. I only
c. I & II only
d. II & III only

Ans: c. I & II only

5. Humans become less selfish when:
a. they work in large groups
b. they listen to frightening stories
c. they listen to cheerful stories
d. they work in solitude

Ans: a. they work in large groups

6. 'Practical Possibles' are the ones who:
a. follow Midway Path
b. are doom-mongers
c. are self-centred
d. are cheerful and carefree

Ans: a. follow Midway Path

Chapter 6 : STATEMENT AND ASSUMPTIONS

1. **Statement:** Do not copy our software without our permission - A notice.

Assumptions:

I. It is possible to copy the software.

II. Such warning will have some effect.

A. Only assumption I is implicit
B. Only assumption II is implicit
C. Either I or II is implicit
D. Neither I nor II is implicit
E. Both I and II are implicit

Ans: Option E

If it were not possible to copy the software, there would be no need for the notice. Hence, (I) is implicitly true. Similarly, if the warning would have no impact, the notice would not be posted. Hence, (II) is also implicit. So, the correct answer is E.

2. **Statement:** Detergents should be used to clean clothes.

Assumptions:

I. Detergents form more lather.

II. Detergents help to dislodge grease and dirt.

A. Only assumption I is implicit
B. Only assumption II is implicit
C. Either I or II is implicit
D. Neither I nor II is implicit
E. Both I and II are implicit

Ans: Option B

Nothing is mentioned about lather formation by the detergent. So, I is not implicit. Also, detergents should be used as they clean clothes better and more easily. So, II is implicit.

3. **Statement:** Everybody loves reading adventure stories.

Assumptions:

I. Adventures stories are the only reading material.

II Nobody loves reading any other material.

A. Only assumption I is implicit
B. Only assumption II is implicit
C. Either I or II is implicit
D. Neither I nor II is implicit
E. Both I and II are implicit

Solution: Option D
Neither (I) nor (II) can be reasonably drawn from the given statement. Thus, correct answer will be D.

4. **Statement:** If you are an engineer, we have a challenging job for you.
Assumptions:
I. We need an engineer.
II. You are an engineer.
A. Only assumption I is implicit
B. Only assumption II is implicit
C. Either I or II is implicit
D. Neither I nor II is implicit
E. Both I and II are implicit.

Solution: Option A
An engineer is needed, hence the advertisement. So, assumption I is implicit. Assumption II is not implicit, even if the reader is an engineer. Hence the correct option is A.

Directions: In each of following questions, a statement is given followed by two assumptions numbered I and II. Consider the statement and the following assumptions and decide which of the assumptions is implicit.

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 both I and II are implicit.
e) If neither I nor II is implicit.

Example 5:
Statement: India must earn a lot of foreign exchange to achieve her target of economic development.

Assumptions:
I. India desires to achieve the target of economic development.
II. It is possible for India to earn more foreign exchange.
Ans: d
I is implicit. Tools for an objective are talked about only when the desire for such an objective exists. II is implicit because it makes no sense to talk of something without the existence of its possibility.

Example 6:

Statement: An advertisement: If you want to follow the footprints of an ideal leader, wear 'X' brand of shoes.

Assumptions:

I. Most people like to become ideal leaders.
II. One can't become ideal leader unless one wears 'X' brand of shoes.

Ans: a
I is implicit; that is why the advertisement has been given. Second one is absured.

Example 7:

Statement: Central Bank, which is the largest bank in the country, has decided to reduce its workforce by 30 percent so that its banks may work efficiently.

Assumptions:

I. The Bank can perform all its activities after the reduction in workforce.
II. The surplus employees may be asked to adopt early retirement scheme before leaving the bank.

Ans : e
I is not implicit because of the word 'all'. II may or may not be a method of reducing the workforce. Hence, II is not implicit.

Directions: In each of following questions, a statement is given followed by two assumptions numbered I and II. Consider the statement and the following assumptions and decide which of the assumptions is implicit.

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.

Example 8:

Statement:

"Private Property, trespassers will be prosecuted"- A notice on a plot of land.

Assumptions:

I. the passerby may read the notice and may not trespass.

II. The people are scared of prosecution and, therefore, never trespass.

Ans: a

Whenever such notices are displayed it is assumed that those who are concerned with the notice will read the notice and follow the messages in it.

Hence, I is implicit. The notice has been placed making the intention of prosecution clear. But it cannot be said certainly. Hence II is not implicit.

Example 9:

Statement:

The nutritional status of children in India is better compared to that in other developing countries.

Assumptions:

I. It is not possible to estimate nutritional requirement of children in other countries.

II. India can become a developed country.

Solution: d

Assumption I contradict the statement. Nothing can be assumed about the scale of becoming developed. Hence II is not implicit.

Example 10:

Statement:

Please do not use lift while going down- an instruction on the top floor of a five-storey building.

Assumptions:

I. While going down, the lift is unable to carry any load.

II. Provision of lift is a matter of facility and not of right.

Solution: d

Both I and II are not implicit as they are out of context. Nothing has been mentioned in the statement.

Chapter 7 : Statement & Argument:

Question 1:
Statement: "All citizens above the age of 18 should be allowed to vote in the elections."
Argument: "Lowering the voting age to 16 will encourage political awareness and participation among the youth."

Is the argument valid based on the statement?
A. Yes, the argument is valid.
B. No, the argument is not valid.

Answer: B. No, the argument is not valid.
Explanation: The argument introduces a new idea of lowering the voting age to 16, which is not directly supported by the statement. The statement only talks about citizens above the age of 18 being allowed to vote, not about lowering the voting age.

Question 2:
Statement: "Regular exercise is essential for maintaining good health."
Argument: "Exercise equipment and gym memberships should be made tax-free to encourage people to adopt a healthy lifestyle."

Is the argument valid based on the statement?
A. Yes, the argument is valid.
B. No, the argument is not valid.

Answer: A. Yes, the argument is valid.
Explanation: The argument is directly related to the statement, suggesting a measure (tax exemption) to promote regular exercise, which aligns with the statement's idea that exercise is essential for good health.

Question 3:
Statement: "Due to rising pollution levels, the city is facing a health crisis."
Assumption: "The health crisis is directly caused by pollution."

Is the assumption implicit in the statement?
A. Yes, the assumption is implicit.
B. No, the assumption is not implicit.

Answer: A. Yes, the assumption is implicit.
Explanation: The statement directly links the health crisis to the rising pollution levels, assuming that pollution is the primary cause of the crisis.

Question 4:
Statement: "The workshop on time management is fully booked."
Assumption: "People are interested in improving their time management skills."

Is the assumption implicit in the statement?
A. Yes, the assumption is implicit.
B. No, the assumption is not implicit.

Answer: A. Yes, the assumption is implicit.
Explanation: The statement implies that people are interested in improving their time management skills as the workshop is fully booked, indicating a demand for such sessions.
C. Statement & Conclusion:

Question 5:
Statement: "All employees who meet their monthly targets receive a performance bonus."
Conclusion: "John will receive a performance bonus this month."

Is the conclusion valid based on the statement?
A. Yes, the conclusion is valid.
B. No, the conclusion is not valid.

Answer: B. No, the conclusion is not valid.
Explanation: The statement only establishes a condition for receiving a performance bonus, but it doesn't provide any information about whether John has met his monthly targets or not. Thus, the conclusion cannot be valid based on the given statement alone.

Chapter 8 : COMPREHENSION

1. Read the given comprehension and answer the questions that follow.

Elections were in the air of the world's youngest democracy when I arrived in Thimphu. This was for a by-election in the capital city, that dominated the conversation at dinners, even in Thimphu's most fun night-spot Mojo Park (the best music in town). Bhutan has taken to democracy with ease ever since 2008 when the first proper elections were held, a process India has helped out with, sending officials from the Election Commission travelling to check arrangements, explain electronic voting machine (EVM) technology and procedures. However, there are many things uniquely Bhutanese:

Monks and nuns in this deeply religious Buddhist majority are not allowed to vote, so as to avoid mixing religion and politics. All voters must wear their national dress on polling day, but no one—candidate, campaigner or voter—is allowed to wear the kabney silk and gyentag (scarf of honour, for men and women respectively, bestowed only by the King), patang (ceremonial sword), or any other sign of rank or royal patronage to avoid a misuse of influence. And, in deference to the environment, no posters can be put up on any public property, including trees, and are mostly restricted to a community billboard for all. Maybe a thing or two the world's largest democracy could learn from the youngest?

Royal textiles

If you're in Thimphu, put the Textile Museum on your must-do list. The museum, run by the Royal Textile Academy is the project of Ashi Sangay Choden Wang chuck, one of the Queen Mothers of Bhutan (the former King had four Queens, all sisters). The museum is dedicated to preserving the oldest and rarest woven fabrics worn in Bhutan and used in their religious **scrolls** and Thangkhas. As you walk in, it is the 'Thongdrel' or massive silk work of the Zhabdrung Phuensum Tshogpa (in honour of a sacred meal served to Bhutan's political and spiritual founder in 1637) that greets you. The thongdrel stands 34 feet tall, running 23 feet across and is set against a glass window that runs three stories high.

Another on your must-see list is the relatively new Tara Lakhang and Pangrizampa monastery on the **outskirts** of Thimphu. This is Bhutan's only monastery dedicated to 21 Taras, the female Bodhisattva and it is a powerful display of ancient feminism. Compared to the rest of the subcontinent, women

have a status more equal to men in Bhutan. There isn't the obvious preference for the male child, girls and boys go to school in equal numbers.

Not so equal. While polygamy is practiced in some parts, so is polyandry, and divorce settlements are equal and even-handed. Even so, Bhutanese women lag behind in one place that it counts: parliament. In the last National Assembly elections, 3/4ths of the 47 seats had only male candidates (nine had females), and four women were elected as MPs. "**Misogyny** plays only one part of it," explains the only leader of a party (DCT) Lily Wangchuk, who runs a hotel in downtown Thimphu. "Women just don't vote for women, and the lack of women role models in modern Bhutan becomes a vicious cycle."

While Bhutan's government and people tell you they are devoted to preserving the country and its beauty, it is plain to see Bhutan is changing every day in little ways. Less youngsters adhere to the traditional and once mandatory national dress (Goh and Kira), more and more buildings now get permission to rise above the originally regulated two stories, and glass and granite is seen more in Thimphu where once only wood and paint were allowed. Some modernities are welcome, and the abundance of hydropower electricity means many Bhutanese (including the very dashing U.S.-educated Prime Minister Tshering Tobgay) drive hybrid cars. The countryside is still pristine, and not covered with the plastic waste ubiquitous in India, even as Bhutan explores more 'non-wood' uses for its 70% forest cover that is also mandated in the constitution. There is, however, one place that doesn't change, and it is always my first stop when I land in Paro: the Kyichu Lhakhang. This is one of Bhutan's oldest and simplest monasteries, believed to be constructed in 659 CE, by Tibetan king Songtsen Gampo and has a link to the Jokhang temple in Lhasa.

All year round, one is welcomed into Kyichu with a spectacular and miraculous orange tree **laden** with fruit. It is here that you know the truth of Bhutan Tourism's catchy slogan, 'Happiness is a place.'

1. **Which of the following statements is/are correct regarding the 2008 Elections of Bhutan?**

I. India helped Bhutan in elections by sending officials from Election Commission of India.

II. Monks and nuns were not allowed to vote.

III. Wearing National Dress on Election Day was compulsory.

a. All are Correct
b. II and III only
c. I and III only
d. I and II only

Answer: c. I and III only

2. Who is 'Ashi Sangay Choden Wang chuck' as mentioned in the passage?

a. The elected Prime Minister of Bhutan
b. The elected President of Bhutan
c. Queen Mother of Bhutan
d. None is Correct

Answer: c. Queen Mother of Bhutan

3. Consider the following statements regarding the 'Mojo Park' as mentioned in the passage.

I. It is situated in the Northeast India.
II. It is famous for its Music Shows.
III. It is situated in the City of Thimphu.

a. All are Correct
b. II and III only
c. I and III only
d. I and II only

Ans: c. Queen Mother of Bhutan

4. Which of the following statements is correct as given in the Passage?

a. Polyandry is not practiced in Bhutan.
b. Polygamy is practiced in Bhutan.
c. There is not a single Female Member in Bhutan's Parliament.
d. None is Correct

Ans: b. Polygamy is practiced in Bhutan.

5. Why was candidate, campaigner or voter not allowed to wear any sign of rank or royal patronage in the 2008 Elections of the country?

a. Due to some kind of superstition.
b. To neglect the misuse of influence of wealthy and famous people.
c. Both are Correct
d. None is Correct

Ans: b. To neglect the misuse of influence of wealthy and famous people.

6. Consider the following statements regarding the 'Kyichu Lhakhang' as given in the passage:

I. He was the first Prime Minister of Bhutan.
II. It is one of Bhutan's oldest monasteries.
III. It was built in 7th Century.

a. I and II only
b. All are Correct
c. I and III only
d. II and III only

Ans: d. II and III only

7. Choose the word which is Most Similar to the word printed in bold in the passage. Scrolls

a. Document
b. Aimless
c. Rolling
d. None is Correct

Ans: a. Document

8. Choose the word which is Most Similar to the word printed in bold in the passage. Outskirts

a. Downtown
b. Away
c. Center
d. Periphery

Ans: d. Periphery

9. Choose the word which is Most Opposite to the word printed in bold in the passage. Laden

a. Empty
b. Full
c. Charged
d. Encumbered

Ans: a. Empty

10. Choose the word which is Most Opposite to the word printed in bold in the passage. Misogyny

a. Woman-hater
b. Sexist
c. Feminist
d. None is Correct.

Ans: c. Feminist

Chapter 9 : DATA INTERPERTATION

Direction: Refer the following table for Question numbers 1,2 and 3

State	Total number of male & female employees	Ratio of number of males to that of female employees	Percentage of post – graduate among total employees
A	20,000	13 : 7	60
B	30,000	8 : 7	50
C	25,000	5 : 5	64
D	40,000	14 : 6	72
E	10,000	6 : 4'	42

1. Find the number of male employees in state D:
   a. 14,000 b. 6,000 c. 28,000 d. 20,000

Ans: c. 28,000

Solution: Total number of employees in state D 40,000.
Out of 20 (14 + 6), 14 are male.
So, number of male employees = 40,000 × 14 / 20 =28,000.

2. Find the number of post graduate female employees in state B
   a. 8,000 b. 15,000 c. 2,800 d. 7,000

Ans: d. 7,000

Solution: Total number of employees in state B is 30,000.
Number of female employees=30,000 × 7 / 15 =14,000
Number of females post graduate employees is 50% of number of employees = 50% of 14,000 = 7,000.

3. Find the number of post graduate male employees in state A and B
   a. 15000 b. 15800 c. 18000 d. 16800

Ans: b. 15,800

Solution: Post graduate male employees in state A
= 20,000 × 13/20 × 60%
= 13,000 × 60 / 100 = 7,800
Post graduate male employees in state B

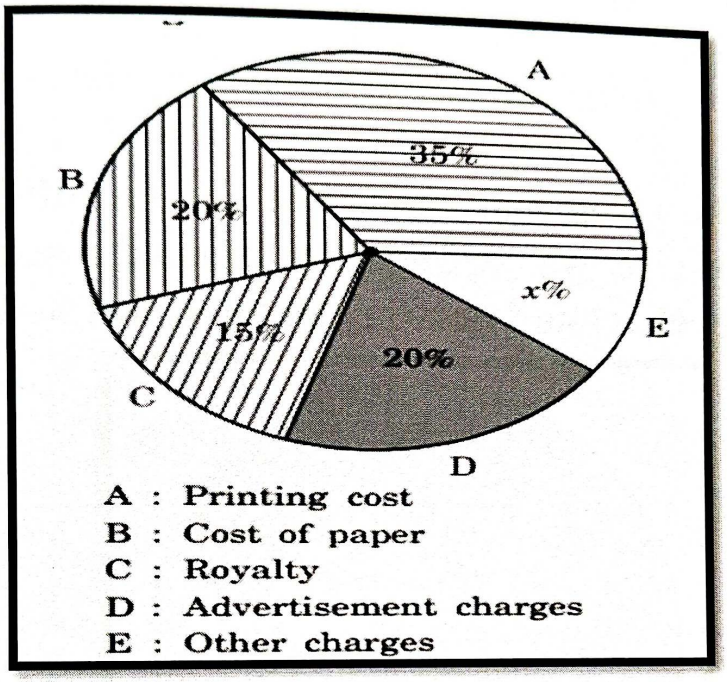
$= 30,000 \times 8/15 \times 50\%$

$= 16,000 \times 50/100 = 8,000$

Number of post graduate male employees in state A and B

$= 7,800 + 8,000 = 15,800.$

Direction: Refer the following table for Question numbers 4, 5 and 6



4. If the cost of paper is Rs. 16,000, then find the amount of other charges in Rs is

a. 16,000 b. 10,000 c. 8,000 d. 12,000

Ans: Option C

Solution: Cost of paper, B is 20% of total expenditure = Rs. 6,000.

Total expenditure = 16,000 × 100/20 = Rs. 80,000

Then other charges = 100 - (20 + 15 + 20 + 35)

= 10% will be Rs. 8,000.

5. The tax deducted at source is 10% of the royalty amount. Then the amount of tax paid is

a. Rs. 1200 b. Rs. 800 c. Rs. 1000 d. Rs. 8000

Ans: Option A

Solution: Total expenditure is Rs. 80,000.

Royalty, C, is 15% of total = 80,000 × 15/100 = Rs.12,000

Tax is 10% of Royalty = 12,000 × 10% = Rs. 1,200.

6. What is the central angle of the sector corresponding to the expenditure incurred on Royalty?

a. 30° b. 36° c. 54° d. 60°

Ans: Option C

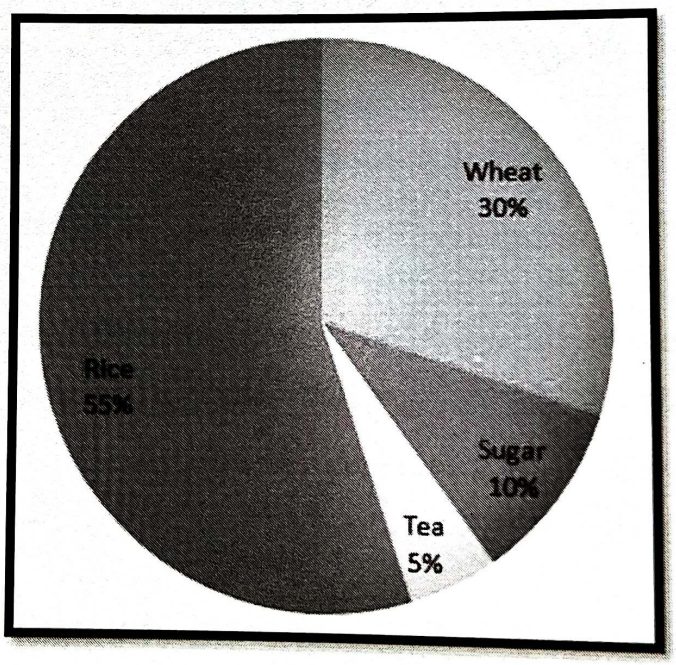
Solution: Angle = 15% of 360 = 360 × 15/100 = 54°

7. The ratio of printing cost to royalty is

a. 3:1 b. 7:3 c. 4:3 d. 2:1

Ans: Option B

Direction: In the given pie- chart, the comparative study of the production of rice, wheat, sugar and tea of a country is given. Study the pie- chart and answer the questions 8-10



8. The Production of the Rice, Wheat, Sugar and Tea is 50000 Kg. Find the production of Rice

a. 17500 kg b. 39500 kg c. 27500 kg d. 2750 kg

Ans: Option C

Solution: Rice + Wheat + Sugar + Tea = 50000

55% + 30% + 10% + 5% = 50000

then rice 55% = 50000 × 55/100 = 27500 kg

9. The production of rice and tea is more/greater than production of wheat by

a. 50% b. 100% c. 75% d. 66.6%

Ans: Option B

Solution: Rice + Tea = 55% + 5% = 60%

Wheat = 30%. So more by 30/30 × 100 = 100%

10. From this diagram, the ratio of sum of wheat and sugar production to the difference in production of rice and tea is:

a. 4 : 5 b. 5 : 4 c. 6 : 1 d. 1 : 6

Ans: Option A

Solution: (Wheat + Sugar) : (Rice - Tea)

(30 + 10) : (55 - 5)

40 : 50

4 : 5

Unit III - Logical Reasoning

Chapter 1 - Coding and Decoding

1. In a code language, if TRAINS is coded as RTIASN, how will FLOWER be coded in the same language?

a. LFOWER. b. LFWORE. c. WORELF. d. ERFLOW

Ans: b. LFWORE

Solution: TRAINS => RTIASN. If we observe the pattern, each letter in the original word "TRAINS" is shifted one position backward in the alphabet.

Applying the same pattern to "FLOWER":

F => E; L => K; O => N; W => V; E => D; R => Q

2. In a certain code language, the word PARTNER is coded as TRAPREN, how will FOUNDER be coded in the same language

a. NUOFDER. b. NOUFRED. c. FOUNRED. d. OFNUEDR

Ans: b. NOUFRED

Solution: PARTNER => TRAPREN. If we observe the pattern carefully, it appears that each letter has been shifted three positions backward in the alphabet.

Applying the same pattern to "FOUNDER":

FOUN => NUOF; DER => RED; Word = NUOFRED

3. In a code language, if SUGAR is coded as ZNMDB and TEA is coded as FLD, how would you code GRATE in the same code for

a. BNDFL. b. MBDFL. c. LDZMN. d. FLDZB

Ans: b. MBDFL

Solution: The word SUGAR is coded as ZNMDB. The word TEA is coded as FLD.

Therefore G = M (From SUGAR); R = B (From SUGAR); A = D (From SUGAR); T = F (From TEA); E = L (From TEA)

GRATE = MBDFL.

4. If in a certain code language, TWENTY is coded as 863985 and ELEVEN is coded as 323039, how will TWELVE be coded?

a. 863903. b. 86365. c. 863203. d. 683583

Ans: c. 863203

Solution: TWENTY = 863985; ELEVEN = 323039

Therefore, TWELVE; T = 8(From TWENTY), W = 6(From TWENTY), E = 3 (From ELEVEN), L = 2 (From ELEVEN), V = 0(From ELEVEN), E = 3 (From ELEVEN).

TWELVE = 863203.

5. In a certain code language, the word RECTANGLE is coded as TGEVCPING, then how is the word RHOMBUS coded?

a. TJOQDWV. b. UVWTJQN. c. TJQODWU. d. JTQOEWN

Ans: c. TJQODWU.

Solution: RECTANGLE = TGEVCPING

It seems like each letter in the original word is shifted by a certain number of positions to form the code. Let's apply this pattern to "RHOMBUS":

R => T; H => J; O => Q; M => O; B => D; U => W; S => U

RHOMBUS = TJQODWU.

6. If wall is called window, window is called door, door is called floor, floor is called roof and roof is called ventilator, what will a person stand on?

a. door. b. ventilator. c. roof. d. floor

Ans: c. roof.

Solution: A person stands on a floor and floor are called roof.

7. In a certain language, the word REJECT is written as SGMIHZ. How will the word ACCEPT be written?

a. BEFIU b. BEVMUZ. c. BEEIUZ. d. BEFIUZ

Ans: d. BEFIUZ

Solution: REJECT = SGMIHZ;

R = +1 = S, E = +2 = G, J = +3 = M, E = +4 = I, C = +5 = H,

T = +6 = Z

Therefore, ACCEPT = BEFIUZ

8. If in a certain language CHENNAI is coded as DGFMOZJ how is MUMBAI coded in the same language?

a. NTNABH. b. LVLCZJ. c. LTLCBH. d. NVNCBJ

Ans: a. NTNABH

Solution: CHENNAI = DGFMOZJ

C = +1 = D, H = -1 = G, E = +1 = F, N = -1 = M, N = +1 = O,

A = -1 = Z, I = +1 = J

Therefore, MUMBAI = NTNABH

9. If in a certain code language, MIRROR is coded as 1391818181518 how will APPLE be coded in the same language?

a. 11616125. b. 3984145. c. 1162254. d. 11213147

Ans: a. 11616125

Solution: Numeric values for alphabets M is 13, I is 9, R is 18 and O is 15

For the word APPLE; A = 1, P = 16, P = 16, L = 12 & E = 5

So, the code is 11616125

10. If EAT is 26, ZEAL is 44 and AROMA is 48, how is HELMET written in the same language?

a. 23 b. 63 c. 83 d. 53

Ans: b. 63

Solution: EAT → E= 5, A = 1, T = 20 → 5 + 1 + 20 = 26

ZEAL → Z = 26, E = 5, A = 1, L = 12 → 26 + 5 + 1 + 12 = 44

AROMA → A = 1, R = 20, O=14, M=12, A=1

→ 1 + 20 + 14 + 12 + 1 = 48

So, for HELMET; H = 8, E = 5, L = 12, M = 13, T = 20

→ 8 + 5 + 12 + 13 + 5 + 20 = 63.

11. In a certain code language, SIMPLE is written as ISPMEL and CHAPTER is written as HCPARET. Then LFWORE stands for which word?

a. LOWFER b. FLOREW c. FLOWER d. WORELF

Ans: c. FLOWER

Solution: SIMPLE = ISPMEL => Two letters are reversed

=> SI = IS; MP = PM; LE = EL

LFWORE = FLOWER => Two letters are reversed

LF = FL; WO = OW; RE = ER

12. In a certain code language, if CARROM is written as MORRAC, then what is the word coded as TIBBAR

a. RIBBAT b. RABBIT c. BARTIB d. BITRAB

Ans: b. RABBIT

Solution: CARROM is written in reverse order MORRAC

Then, TIBBAR = RABBIT

13. In a certain code language, if POURING is written as xfnplom, SAMPLE is written as zehxcj and WHITENER is written r atlkjojp, then which word is written as hjecz?

a. LEAMS b. SMEAL c. MEALS d. MALES

Answer: c. MEALS

Solution:

Letter	P	O	U	R	I	N	G	S	A	M	P	L	E	W	H	T
Codes	X	F	N	P	L	O	M	Z	E	H	X	C	J	A	T	K

HJECZ => MEALS

14. If in a certain language POWERFUL is coded as QQZIWLBT, then which word is coded as ECQGJXZ?

a. DANCERS b. HARMLESS c. PRACTISE d. DANGERS

Ans: a. DANCERS

Solution: POWERFUL = QQZIWLBT

P = +1 = Q, O = +2 = Q, W = +3 = Z, E = +4 = I, R = +5 = W,

F = +6 = L, U = +7 = B, L = +8 = T

Therefore, E = -1 = D, C = -2 = A, Q = -3 = N, G = -4 = C,

J = -5 = E, X = -6 = R, Z = -7 = S

15. If the code in a certain language, for PAPER=56 and SHEET=56, then for which of the following words is the code 88?

a. IRON b. PUPPE c. HELMETS d. PARROT

Ans: d. PARROT

Solution: PAPER => P = 16, A = 1, P = 16, E = 5, R = 18

⇨ 16 + 1 + 16 + 5 + 18 = 56

SHEET => S = 19, H = 8, E = 5, E = 5, T = 20

⇨ 19 + 8 + 5 + 5 + 20 = 57

Therefore, from the options let us take,

PARROT => P = 16, A = 1, R = 18, R = 18, O = 15, T = 20

=> 16 + 1 + 18 + 18 + 15 + 20 = 88

Unit III - Logical Reasoning

Chapter 2 - Blood Relations

Content	Relation
Father's or Mother's Daughter	Sister
Father's or Mother's Son	Brother
Father's or Mother's Sister	Aunt
Father's or Mother's Brother	Uncle
Father's or Mother's Mother	Grandmother
Father's or Mother's Father	Grandfather
Daughter's Husband	Son-in-law
Son's Wife	Daughter – in – law
Husband's or Wife's Brother	Brother – in – law
Husband's or Wife's Sister	Sister – In – law
Brother's Daughter	Niece
Brother's Son	Nephew
Brother's Wife	Sister-in-law
Sister's Husband	Brother- in- law
Aunt's or Uncle's Son or Daughter	Cousin
Granddaughter's or Grandson's daughter	Great grand daughter

1. Pointing towards a photograph Mr. Sharma said "She is the only daughter of mother of my brother 's sister". How is Mr. Sharma related to the lady in the photograph?

a. cousin b. sister c. aunt d. daughter in law

Ans: b. sister

2. Nicholas said "This girl is the wife of the grandson of my mother". Who is Nicholas to this girl?

a. father b. husband c. grandfather d. Father-in-law

Ans: d. Father-in-law

3. Q is the brother of C and C is the sister of Q. R and D are brother and sister. R is the son of A while A and C are wife and husband. How is A related with D

a. sister b. brother c. aunt d. uncle

Ans: d. uncle

4. Introducing a boy, a girl said," He is the only son of my mother's mother "How is the girl related to the boy?

a. aunt b. niece c. sister d. mother

Ans: b. niece

5. A Woman said to a man, "The daughter of your only sister is the sister of my husband". What is the relation of man's sister to the woman?

a. Mother b. Mother-in-Law c. Daughter d. Data Inadequate

Answer: b. Mother-in-Law

6. Q's mother is the sister of R and daughter of S and N is the daughter of R and sister of M. How is M related to S?

a. Son b. Son's Father c. Daughter's Son

d. Data Inadequate

Ans: d. Data Inadequate

7. Pointing to the woman in the picture, Rajiv said, "Her mother has only one grandchild whose mother is my wife". How is the woman in the picture related to Rajiv?

a. Cousin b. Wife c. Sister d. None of these

Ans: b. Wife

8. Pointing to a man, a woman said, "He is the brother of my uncle's daughter". How is the man related to woman?

a. Cousin b. Son c. Uncle d. Brother-in-law

Answer: a. Cousin

Unit III - Logical Reasoning

Chapter 3 – Puzzle Test

Directions for questions 1 to 3: Read the following information carefully and answers the questions below A, B, C, D and E are famous for their Lovely Garden, Fancy Jewellery, Educational Institute, Blue Pottery and Scents but not in the same order

I. A and C are neither Educational Institutes nor have gardens.

II. B and E are not famous for Jewellery or Pottery.

III. Scents and Jewellery have nothing to do with A.

IV. D and E are not famous for Garden and Jewellery.

V. D is not famous for Educational Institutes.

1. Which of the following city is famous for gardens?

a. A b. C c. D d. B

Ans: b. C

2. Blue Pottery is available in which of the following cities?

a. A b. C c. E d. B

Ans: a. A

3. City E is famous for which of the following?

a. Jewellery b. Educational Institutes

c. Blue Pottery d. Scent

Ans: b. Educational Institutes

Directions for questions 4 to 8: Lectures A, B, C, D, E and F are to be organized in a span of seven days from Sunday to Saturday, only one lecture on each day in accordance with the following:

I. A should not be organized on Thursday

II. C should be organized immediately after F.

III. There should be a gap of two days between E and D.

IV. One day there will be no lecture (Friday is not that day), first before that day D will be organized.

V. B should be organized on Tuesday and should not be followed by D.

4. On which day, there is no lecture?

a. Monday b. Friday c. Sunday d. Cannot be determined

Ans: a. Monday

5. How many lectures are organized between C and D?

a. Three b. One c. Two d. None

Answer: a. Three

6. Which day will the Lecture F be organized?

a. Thursday b. Friday c. Saturday d. Sunday

Ans: a. Thursday

7. Which of the following is the last lecture in the series?

a. A b. B c. C d. D

Answer: a. A

8. Which of the following information is not required in finding the complete sequence of organization of lectures?

a. Only I b. Only II c. Only V d. All are required

Answer: d. All are required

9. If wall is called window, window is called door, door is called floor, floor is called roof and roof is called ventilator, what will a person stand on?

a. Door b. Ventilator c. Roof d. Floor

Answer: c. Roof

(A person stands on the floor and in the given code language. floor is called roof. Hence. roof will be the correct answer.)

10. How many times can you subtract the number 5 from 35?

a. 1 b. 4 c. 7 d. 5

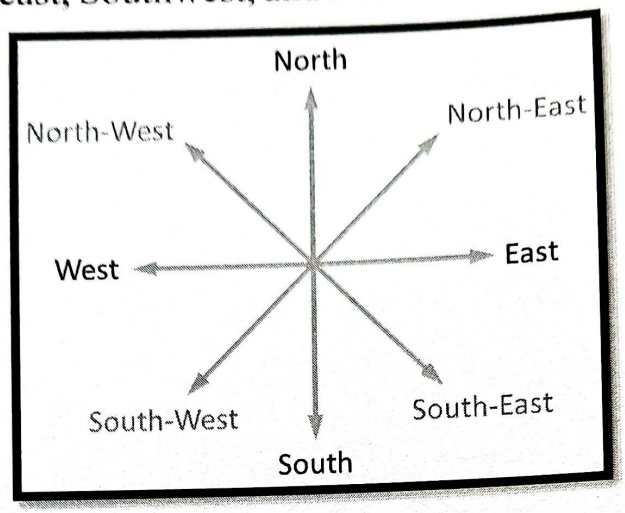
Answer: a. 1

Once. After the first calculation, you will be subtracting 5 from 30, then 5 from 25, and so on

Chapter 4 – Directions

Points to remember:

1. The cardinal directions are divided into four primary inter-cardinal directions; Northeast, Southeast, Southwest, and Northwest as shown in the following image.



2. At the time of sunrise, if a man stands facing the East, his shadow will form to the west.

3. At the time of sunrise, if a man stands facing the North, his shadow will form to his left.

4. At the time of sunrise, if a man stands facing the South, the shadow will form to his right.

5. At the time of sunrise, if a man stands facing the West, the shadow will form to the West.

6. At the time of sunset, if a man stands facing the North, his shadow will form to his right.

7. At the time of sunset, if a man stands facing the East, his shadow will form to the East.

8. At the time of sunset, if a man stands facing the sun, towards West, his shadow will form to

the East.

9. At the time of sunset, if a man stands facing the South, his shadow will form to his left.

1. A is 40 m south-west of B. C is 40 m south-east of B. Then, C is in which direction of A?

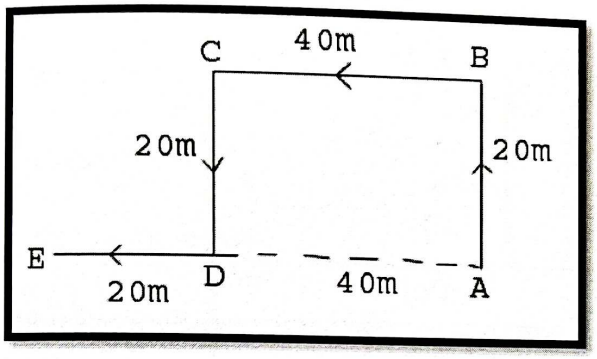
Ans: C lies to the East of A

2. Gaurav walks 20 metres towards North. He then turns left and walks 40 metres. He again turns left and walks 20 metres. Further, he moves 20 metres after turning to the right. How far is he from his original position"?

a. 20 metres b. 30 metres c. 50 metres d. 60 metres

Ans: d. 60 metres.

Solution: Gaurav is at a distance of 60 metres from his original distance.

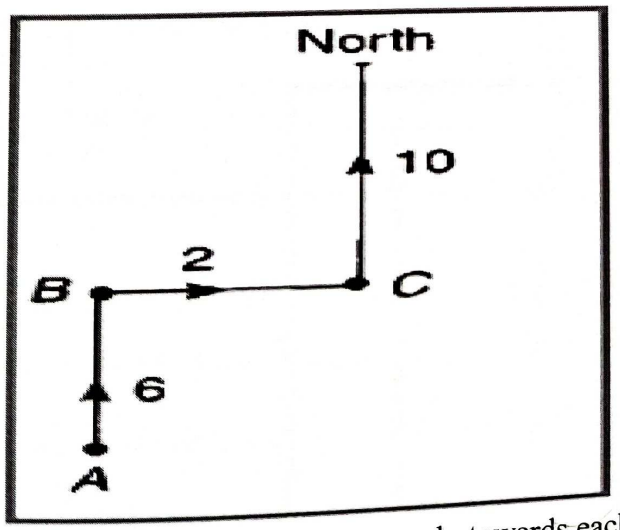


3. After walking 6 km, I turned right and covered a distance of 2 km, then turned left and covered a distance of 10 km. In the end. I was moving towards the north. From which direction did I start my journey"

a. North b. South c. East d. West

Answer: b. South

Solution: The man started his journey from the south and moved northwards.



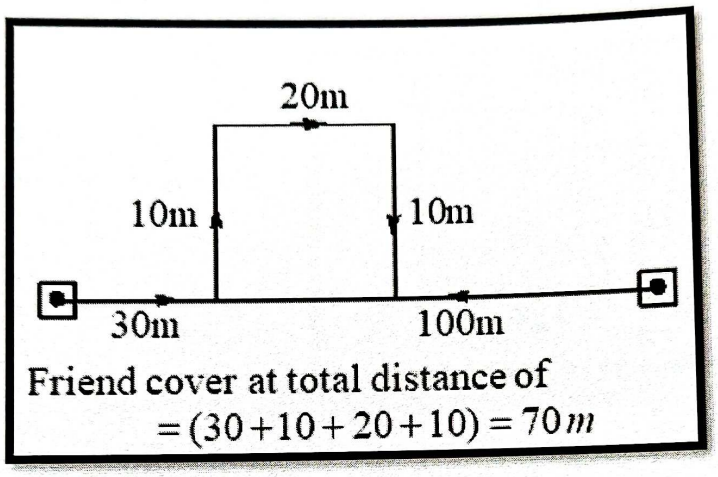
4. My Friend and I started walking simultaneously towards each other from two places 100 m apart. After walking 30m, my friend turns left and goes 10m, then he turns right and goes 20m

and then turns right again and comes back to the road on which he had started walking. If we walk with the same speed, what is the distance between us at this point of time?

a. 50m b. 20m c. 30m d. 40m

Ans: b. 20m

Solution: Distance between us is (70m - 50m = 20 m)



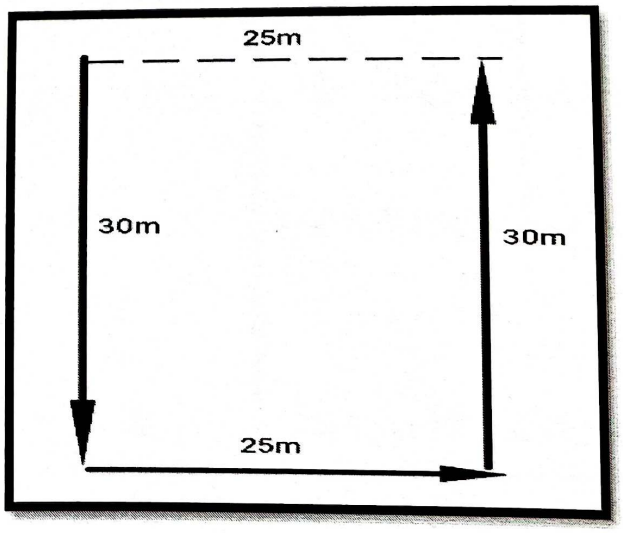
5. Facing towards South, Ram started walking and turned left after walking 30m, he walked 25m and turned left and walked 30 m. How far is he from his starting position and in which direction?

a. At the starting point only b. 25m, west c. 25m, East

d. 30m, East

Ans: b. 25m, west

Solution:



6. Starting from Point A, Richa walked 3m South. Then, she turned left and walked 4 m. How far is she now from the starting point and in which direction?

a. 5m, South-West b. 5m, North-East c. 5m, South-East

d. 5m, North-West

Ans: c. 5m, South-East

Solution: Distance = $\sqrt{(3m)2 + (4m)2}$

Distance = $\sqrt{9 + 16}$

Distance = $\sqrt{25}$

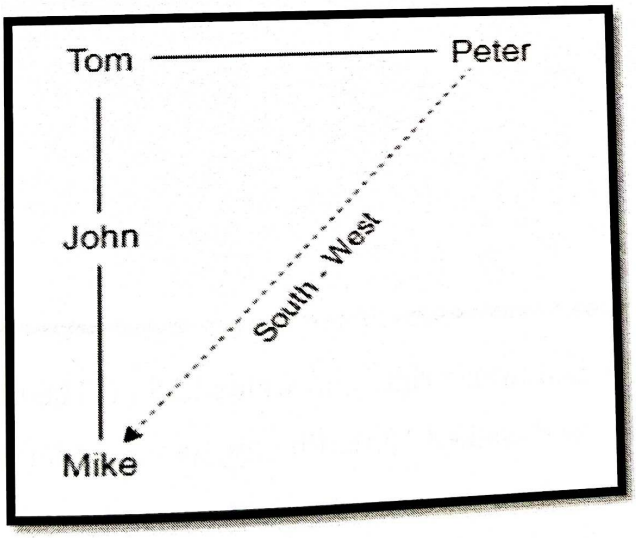
Distance = 5 meters

7. Peter is in the East of Tom and Tom is in the North of John. Mike is in the South of John then in which direction of Peter is Mike?

a. South-East b. South-West c. South d. North-East

Ans: b. South-West

Solution:

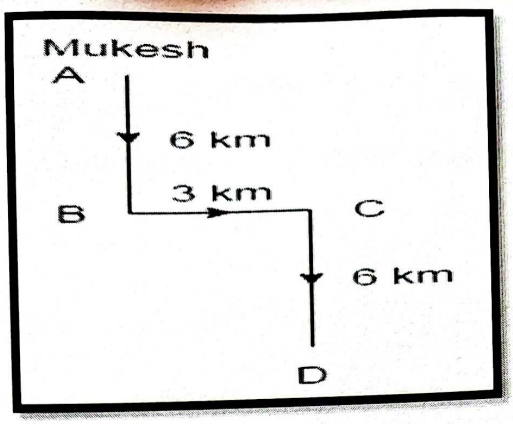


8. Mukesh walks 6 km toward the South and then walks 3 km to his left. Finally, he turns to his right and walks 6 km. In which direction is he from the starting point?

a. South b. South-West c. South-East d. West

Ans: c. South-East

Solution:

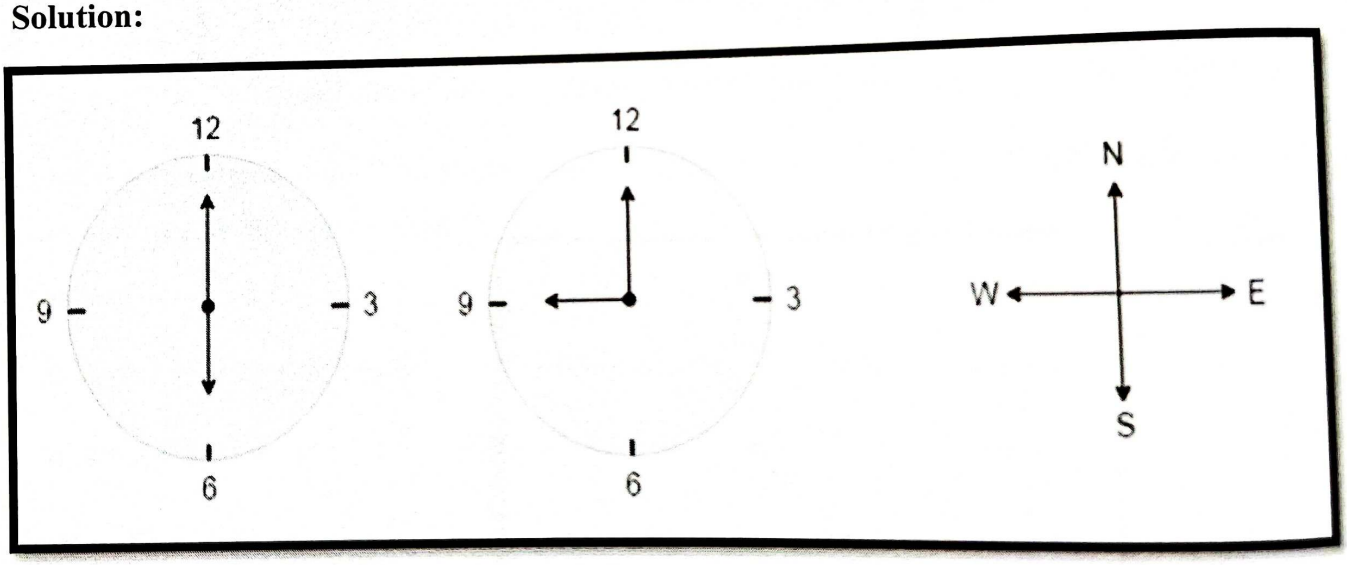


9. Deepak placed his watch on the table in such a way that at 6 pm the hour hand points to the South. In which direction the minute hand will point at 9 pm?

a. North b. West c. South d. East

Ans: a. North

Solution:



10. Tom walked 10 m towards north then turned right and walked 25 m. Then he turned right and walked 30 m. Now he turned left and walked 10 m. Finally, he turned left and walked 20 m. How far and in which direction is he from the starting point?

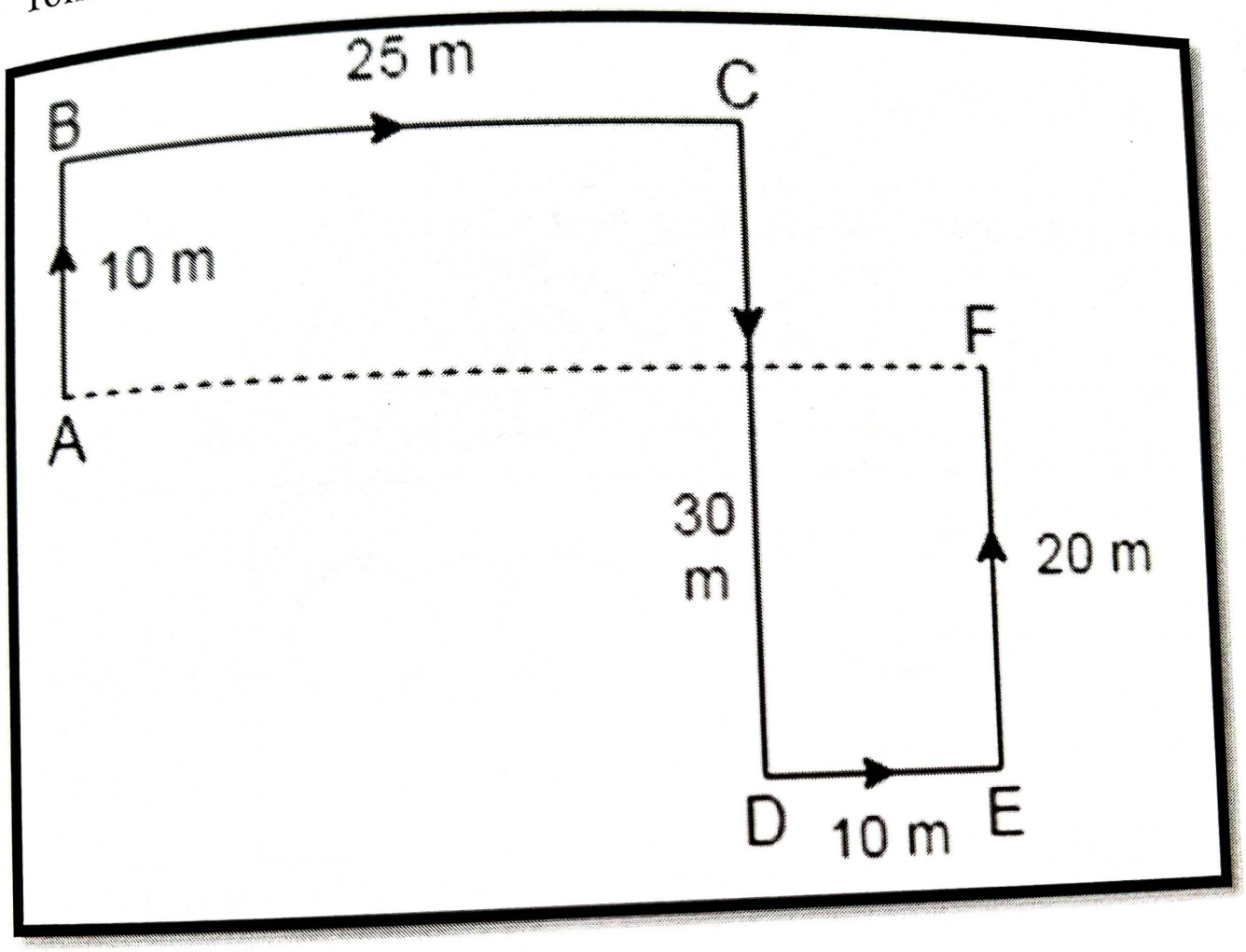
a. 50 m East b. 30 m North c. 40 m North d. 35 m East

Ans: d. 35 m East

Solution: Distance between the initial and final position = AF = BC + DE

AF = 25+ 10 = 35 m

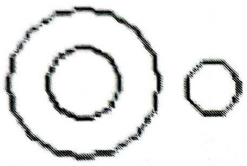
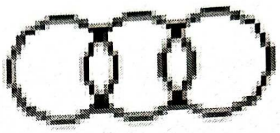
Tom is in the east direction from the starting point.



Unit III - Logical Reasoning

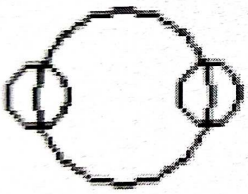
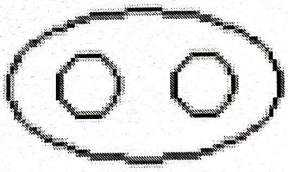
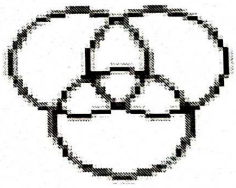
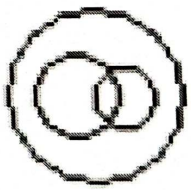
Chapter 5 – Venn Diagram

1. Which of the following diagrams indicates the best relation between Travelers, Train and Bus?

a.	b.	c.	d.
			

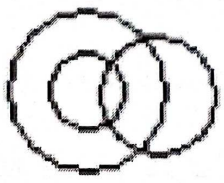
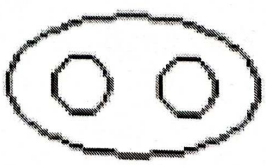
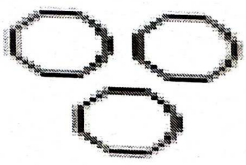
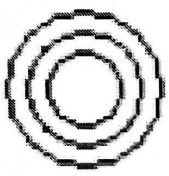
Ans: c. Bus and Train are different from each other but some travellers travel by bus and some travel by train.

2. Which of the following diagrams indicates the best relation between Profit, Dividend and Bonus?

a.	b.	c.	d.
			

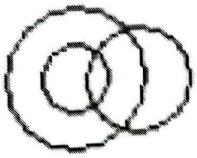
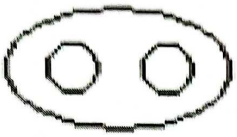
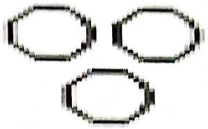
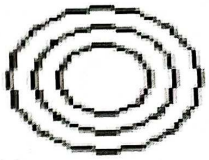
Answer: b. Bonus and Dividend are different from each other. But both these are parts of profit.

3. Which of the following diagrams indicates the best relation between Women, Mothers and Engineers?

a.	b.	c.	d.
			

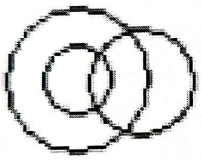
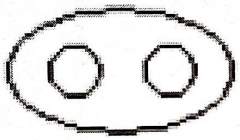
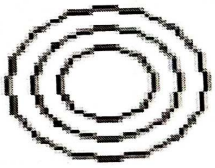
Ans: a. All mothers are women and some mothers and some women may be engineers.

4. Which of the following diagrams indicates the best relation between Factory, Product and Machinery?

a.	b.	c.	d.
			

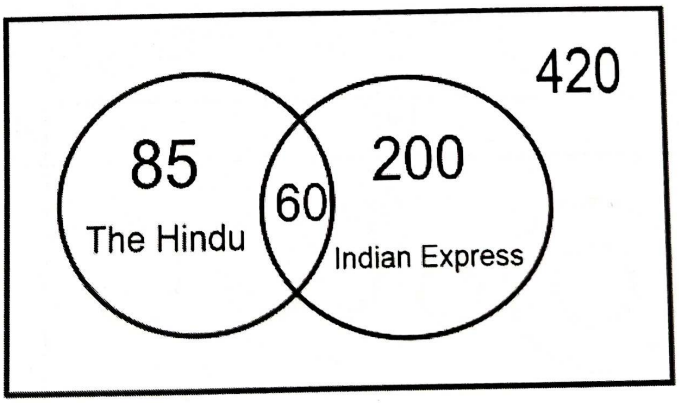
Ans: d. Product and Machinery are different from each other but both are found in Factory.

5. Which of the following diagrams indicates the best relation between Author, Lawyer and Singer?

a.	b.	c.	d.
			

Ans: b. All the three are different professions.

6. From the information given below, find out the number of people who do not read any newspaper.



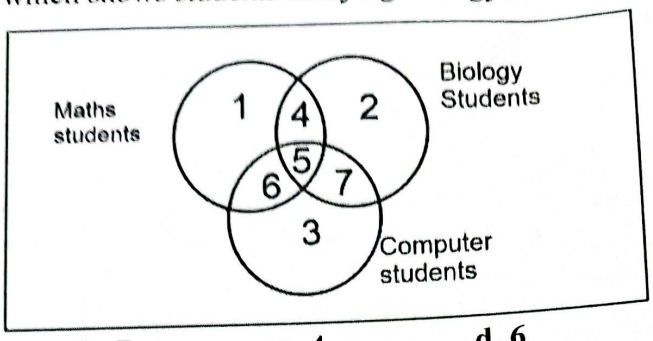
a. 195 **b. 135** **c. 175** **d. 75**

Ans: d. 75

Solution: Total = 420, Newspaper readers = 200 + 60 + 85 = 345,

Non – Readers = 420 – 345 = 75

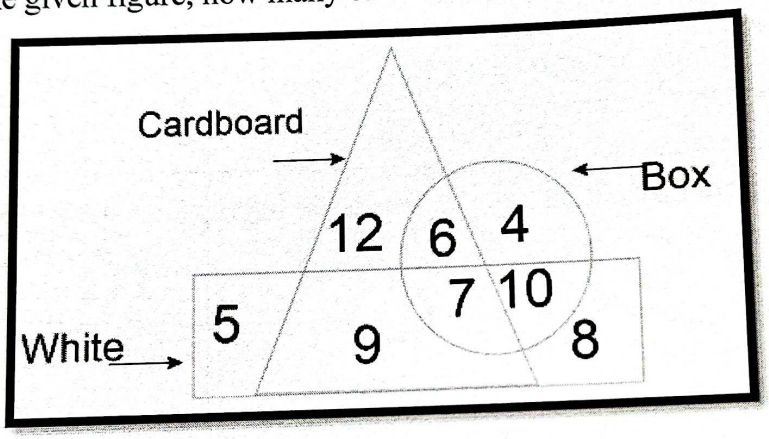
7. Find the area which shows students studying biology and computer but not mathematics.



a. 2 b. 7 c. 4 d. 6

Ans: b. 7

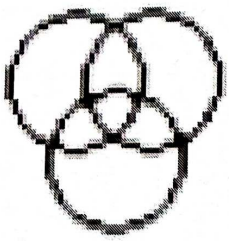
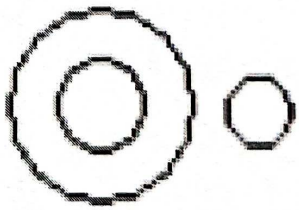
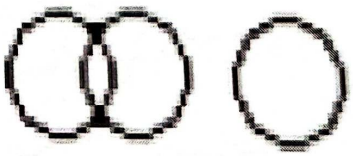
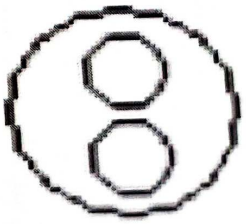
8. In the given figure, how many cardboard boxes are not white?



a. 6 b. 13 c. 7 d. 9

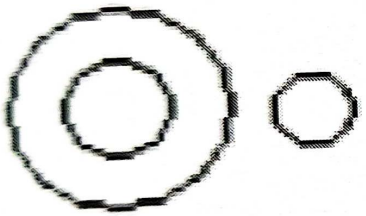
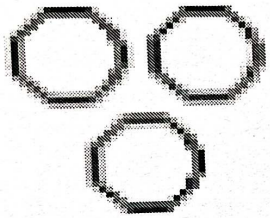
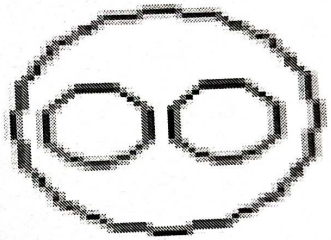
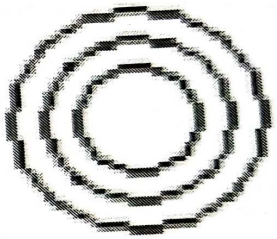
Ans: a. 6

9. Which of the following diagrams indicates the best relation between Judge, Thieves and Criminals?

a.	b.	c.	d.
			

Ans: b. All the thieves are criminals while judge is different from these.

10. Which of the following diagrams indicates the best relation between India, Karnataka and World

a.	b.	c.	d.
			

Ans: d. Karnataka is in India and India is in the World.

Unit III - Logical Reasoning

Chapter 6 – Alphabet Test

1. What is the next alphabet of the series G, H, J, M, _____

a. R b. S c. Q d. P

Ans: c. Q

Solution: Q (G = +1 = H; H = +2 = J; J = +3 = M; M = +4 = Q).

2. Find the Missing Term of the series BF, CH, ____, HO, LT

a. FG b. EK c. CE d. FJ

Ans: b. EK

Solution: BF = +1, +2 = CH; CH = +2, +3 = EK; EK = +3, +4 = HO;

HO = +4, +5 = LT.

3. Find the next Term DCXW, FEVU, HGTS, ____

a. LKPO b. ABYZ c. JIRQ d. LMRS

Ans: c. JIRQ

Solution: DCXW = +2, +2, -2, -2 = FEVU; FEVU = +2, +2, -2, -2 = HGTS;

HGTS = +2, +2, -2, -2 = JIRQ

4. Find the missing term. 2Z5, 7Y7, 14X9, 23W11, 34V13, ____

a. 47T15 b. 47U17 c. 47U15 d. 48U15

Ans: c. 47U15

Solution: 2Z5 = +5, -1, +2 = 7Y7; 7Y7 = +7, -1, +2 = 14X9;

14X9 = +9, -1, +2 = 23W11, 23W11 = +11, -1, +2 = 34V13

34V13 = +13, -1, +2 = 47U15

(The First Place Number is increased by odd Numbers, Second Place Alphabet are reduced by one alphabet, Third Place Numbers are increased by two numbers).

5. Complete the series: Z, L, X, J, V, H, T, F, ___, _____.

a. D, R b. R, D c. D, D d. R, R

Ans: b. R, D

Solution: The Digits in odd place is reduced by one digits and digits in the even place is reduced by one digit.

6. Find missing alphabets b a a b – a b a – b b a – –

a. bbaab b. ababa c. bbabb d. aaaba

Ans: b. ababa

7: PMK, MPK, MKP, KMP, ___

a. PMK b. KMP c. MPK d. KPM

Ans: d. KPM

Solution: In the First the first two letters are interchanged; and second the last digits are interchanged and it is continued.

8: PRIMARILY, RIMARILY, RIMARIL, _____

a. IMAR b. RIMARI c. IMARIL d. RIMA

Ans: c. IMARIL

Solution: PRIMARILY = RIMARILY (1st Letter eliminated);

RIMARILY = RIMARIL (Last Letter eliminated)

RIMARIL = IMARIL (1st Letter must be eliminated)

9: Arrange these words in alphabetical order and tick the one that comes last

1. Abandon **2. Actuate** **3. Accumulate** **4. Acquit** **5. Achieve**

a. Actuate b. Accumulate c. Acquit d. Achieve

Ans: a. Actuate

10: JAF, JEF, JIF, JOF, ____

a. PIG b. PET c. JUF d. POT

Ans: c. JUF. The middle letters which are vowels have an increasing trend of A, E, I, O, U and remaining letters have been retained as it is. So, answer would be JUF.

Unit III - Logical Reasoning

Chapter 7 – Arithmetical Reasoning

1: If 'x' means '-', '÷' means '+', '-' means '÷' and '+' means 'x', then 24 - 4 ÷ 6 x 3 + 4 = _____.

a. 2 b. 1 c. 3 d. 0

Ans: d. 0

Solution: 24 ÷ 4 + 6 – 3 X 4 => 6 + 6 -12 = 0

2: The total of the ages of Amar, Akbar and Anthony is 80 years. What was the total of their ages three years ago?

a. 71 Years b. 72 Years c. 74 Years d. 77 Years

Ans: a. 71 Years

Solution: Required sum = (80 – (3 x 3)) years = (80 - 9) years = 71 years.

3: 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. None of the above

Ans: c. 4

Solution: Let the number of pineapples and watermelons be x and y respectively.

Then, $7x + 5y = 38$ or $5y = (38 - 7x)$ or $y = 38 - 7x / 5$.

Clearly, y is a whole number, only when $(38 - 7x)$ is divisible by 5.

This happens when $x = 4$.

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

Ans: d. 90

Solution: Let number of notes of each denomination be x.

Then, $x + 5x + 10x = 480$ $16x = 480$ $x = 30$.

Hence, total number of notes $= 3x = 90$.

Since one of the numbers on the dial of a telephone is zero, so the product of all the numbers on it is 0.

5: 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

Ans: b. 16 Years

Solution: Manick's present age = 12 years, Rahul's present age = 4 years.

Let Manick be twice as old as Rahul after x years from now.

Then, $12 + x = 2(4 + x)$; $12 + x = 8 + 2x$; $x = 4$.

Hence, Manick's required age $= 12 + x = 16$ years.

6: If you write down all the numbers from 1 to 100, then how many times do you write 3?

a. 11 b. 18 c. 20 d. 21

Ans: c. 20

Solution: From 1 to 100, there are ten numbers with 3 as the unit's digit- 3, 13, 23, 33, 43, 53, 63, 73, 83, 93; and ten numbers with 3 as the ten's digit - 30, 31, 32, 33, 34, 35, 36, 37, 38, 39.

So, required number $= 10 + 10 = 20$.

7: A farmer built a fence around his square plot. He used 27 fence poles on each side of the square. How many poles did he need altogether?

a. 100 b. 104 c. 108 d. None of these above

Ans: b. 104

Solution: Since each pole at the corner of the plot is common to its two sides, so we have: Total number of poles needed = (27 x 4) - 4 = 108 - 4 = 104.

8: The sum of the ages of 3 people A, B and C is 90 years. What would be the total of their ages 4 years back?

a. 74 years b. 78 years c. 86 years d. 80 years

Ans: b. 78 years

Solution: Required Sum: 90 – (4 x 3) = 78 years.

9: 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

Ans: d. 90

Solution: Let number of notes of each denomination be x.

Then, x + 5x + 10x = 480

16x = 480 => x = 30.

Hence, total number of notes = 3x = 90

10: 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

Ans: b. 29

Clearly, every member except one (i.e. the winner) must lose one game to decide the winner. Thus, minimum number of matches to be played = 30 - 1 = 29.

Unit III - Logical Reasoning

Chapter 8 – Input/Output

Input: 79 create history 88 imagined 94 every 63 leader 96

Step I: 88 79 create history imagined 94 63 leader 96 every

Step II: 88 79 96 history imagined 94 63 leader every create

Step III: 88 79 96 history imagined 94 63 every create leader

Step IV: 88 79 96 94 imagined 63 every create leader history

Step V: 88 79 96 94 63 every create leader history imagined

Step V is the last step of the arrangement.

Following the same pattern solve the given input.

Input: never 42 leaved 39 important object 53 46 anyplace 74

1: How many steps will be required to complete the given input?

a. Three b. Seven c. Six d. Five

Ans: d. Five.

2: Which of the following steps will be last but one of the given input?

a. 39 74 46 53 important 42 never leaved object anyplace

b. 39 74 46 53 42 important never leaved object anyplace

c. 39 74 46 42 53 never leaved object anyplace important

d. 39 74 46 53 42 important never object leaved anyplace

Ans: b. 39 74 46 53 42 important never leaved object anyplace

3: Which of the following will be on the immediate right of 'Important' in step III?

a. Object b. Never c. 42 d. 53

Ans: d. 53

4: How many element(s) will be there between '74' and 'leaved' in Step IV?

a. Six b. Four c. Seven d. Five

Ans: d. Five

5: What is the position of 'Object' in step V?

a. Third from right end

b. Second from left end

c. Seventh from left end

d. None of these

Ans: a. Third from right end.

Unit III - Logical Reasoning

Chapter 9 – Series

1: 30, 42, 56 ,72, ____.

a. 80 b. 110 c. 90 d. 82

Ans: c. 90

Solution: 42 – 30 = 12, 56 – 42 = 14, 72 – 56 = 16,

72 + 18 = 90

Here, the numbers are increasing by two starting from 12 as the base number.

2: 8, 16, 48, 192, ____

a. 960 b. 886 c. 990 d. 740

Ans: a. 960

Solution: 8 × 2 = 16, 16 × 3 = 48, 48 × 4 = 192,

192 × 5 = 960.

Here, the number is multiplied by 2, 3 , 4, 5 and continued.

3: 4, 8, 6 ,10, 8, ___.

a. 6 b. 14 c. 10 d. 12

Ans: d. 12

Solution: 4 + 4 = 8, 8 – 2 = 6, 6 + 4 = 10, 10 – 2 = 8, 8 + 4 = 12

Here the series is + 4 & - 2

4: 2, 7, 11, 25, ____.

a. 44 b. 47 c. 55 d. 57

Ans: b. 47

Solution: 2 × 2 + 3 = 7, 7 × 2 – 3 = 11, 11 × 2 + 3 = 25

25 × 2 - 3 = 47

5: 15, 45, 75, 105, ___.

a. 125 b. 145 c. 135 d. 175

Ans: c. 135

Solution: 45 – 15 = 30, 75 – 45 = 30, 105 – 75 = 30,

105 + 30 = 135

6: H, L, P, T, ____.

a. V b. Z c. X d. Y

Ans: c. X

Solution: H = +3 = L; L = +3 = P; P = +3 = T;

T = +3 = X

7: AB, EF, IJ, MN, ___.

a. PQ b. QR c. ST d. GH

Ans: b. QR

Solution: AB = EF = IJ = MN = QR

CD GH KL OP

Excluded

8: EAZ, FBY, ____ ,HDW, IEV

a. CHX b. GDU c. DCT d. GCX

Ans: d. GCX

Solution: EAZ = +1, +1, -1 = FBY, FBY = +1, +1, -1 = GCX

GCX = +1, +1, -1 = HDW, HDW = +1, +1, -1 = IEV

9: DF, GI, JL, MO, ___.

a. PR b. QR c. PQ d. OP

Ans: a. PR

Solution: D = +2 = F = DF; G = +2 = I = GI, J = +2 = L = JL,

M = +2 = O = MO, P = +2 = R = PR

Each Pair has two letter difference and the next pair is the continuous alphabet of the last alphabet in the previous pair.

10: TT, MM, OO, RR, ____.

a. BB b. AA c. FF d. ZY

Ans: b. AA

Chapter 10 – Analogy

1: 4 : 16 : : 3 : 9 : : 8 : 64 ?

a. 9 : 45 b. 6 : 36 c. 12 : 60 D. None of the above

Ans: b. 6 : 36

Solution: 4 = ×4 = 16; 3 = ×3 = 9; 8 = ×8 = 64

As per the option b. 6 = ×6 = 36

2: 60 :1 : : 24 : 1 : : 7 : 1 ?

a. 12 : 1 b. 5 : 1 c. 10 : 1 d. 8 : 1

Ans: **a. 12 : 1**

3: 2 : 10 : : 4 : 20 : : 7 : 35 ?

a. 1 : 16 b. 10 : 50 c. 3 : 27 d. 6 : 48

Ans: b. 10 : 50

Solution: 2 = ×5 = 10; 4 = ×5 = 20; 7 = ×5 = 35

As per the option b. 10 = ×5 = 50

4: 5 : 36 : : 6 : ?

a. 46 b. 49 c. 56 d. 52

Ans: b. 49

5: GATE : HBUF : : TAIL : ?

a. SBHQ b. UBJM c. RCTH d. BNVS

Ans: b. UBJM

Solution: GATE = +1,+1,+1,+1 = HBUF; TAIL = +1,+1,+1,+1 = UBJM

6: CHECK : DJHGP : : PHONE : ?

a. QJRRJ b. OGSSG c. QJSSJ d. None of the above

Ans: a. QJRRJ

Solution: CHECK = +1,+2,+3,+4,+5 = DJHGP;

PHONE = +1,+2,+3,+4,+5 = QJRRJ

7: CDFE : HIKJ : : MNPO : ?

a. PQRS b. NMOP c. STVU d. KJIH

Ans: c. STVU

8: Dog: Puppy: : Cat : ?

a. Chick b. Kitten c. Foal d. Colt

Ans: b. Kitten.

9: Tiger: Cage: : Dog : ?

a. Stable b. Dens c. Kennel d. Sheds

Ans: c. Kennel

10: Bank: Interest: : School : ?

a. Medicine b. Education c. Food d. Plants

Ans: b. Education

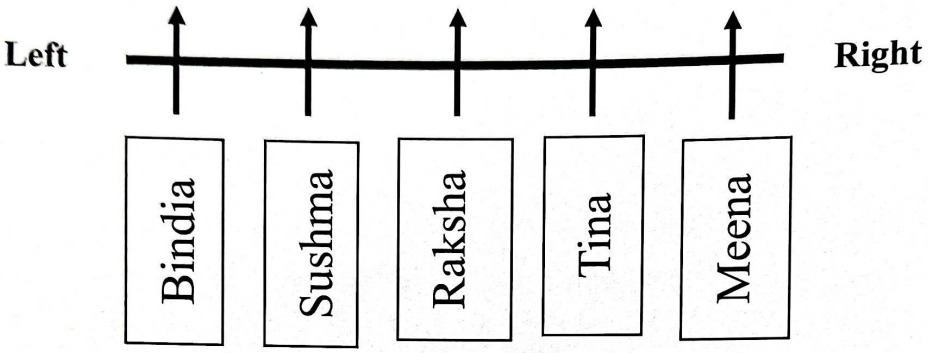
Unit III - Logical Reasoning

Chapter 10 – Seating Arrangement

1: Five friends are sitting in a bench, facing north, but necessarily in the same order. Sushma is to the immediate left to Raksha and immediate right to Bindia. Meena is right to Raksha Tina is exactly between Raksha and Meena Who is sitting at the right most?

a. Teena b. Meena c. Sushma d. Raksha

Ans: b. Meena



2: M, N, O, P, R are sitting together. P is at extreme right. N is to the immediate left to O. R is in between M and N. Who is sitting to the left to P?

a. M b. R c. N d. O

Ans: d. O

Solution: M ⟶ R ⟶ N ⟶ O ⟶ P

3: A, B, C, D, E, F, G are sitting in a row, facing north. D is at the immediate left of C. E and A are the neighbours of F.B is to the immediate right of C. G is at right most. Who is to the extreme left?

a. B b. C c. D d. E

Ans: c. D

Solution: D ⟶ C ⟶ B ⟶ E ⟶ F ⟶ A ⟶ G

4: Chethan, Roopesh, Rohan and Bipin are sitting in a row in the same order from left to right. Radha, Ramya, Sneha and Swathi are sitting facing towards the boys, but need not be in same order. Sneha is at left to Radha. Swathi is in between Ramya and Radha. Who is directly facing Swathi?

a. Roopesh b. Chethan c. Roshan d. Bipin

Ans: c. Roshan

5: Four friends are sitting in front of a round table in clockwise. Pinky is on north and Jyothsna is on south. Maya is to the left side of Jyothsna and opposite to Nayana. In which direction Nayana is sitting?

a. South b. East c. West d. None of the above

Ans: b. East

6: In a school library, five books are placed in a row. Mathematics book is in between Science and English books. Kannada book is to the extreme left. Where the Science book is placed?

a. Middle of the Row b. Left to the Kannada Book

c. Extreme Right d. Between Mathematics and English books

Ans: c. Extreme Right

7: P, Q, R, S, T, U are the students studying from First standard to Sixth standard. P is studying in Third standard and U is not studying in Second standard. Q is in his first stage of education. R is one class above Q. P is two class below T. S is in senior most class. In which class U is studying?

a. Second Standard b. First Standard

c. Fourth Standard d. Sixth Standard

Ans: c. Fourth Standard

8: Four cups are kept in each corner of a rectangular table. Red cup is at north left corner. White cup is at south right corner. Blue cup is at north, facing white cup. Where the orange cup is placed in?

a. South Right b. South Left c. North Right d. None of the above

Ans: b. South Left

9: Five people A, B, C, D, E of different heights are standing in a line. A, who is the tallest, is in the middle. B, with the second most height is to the extreme left. C, who is shorter than B, is to the immediate right of A. The shortest E is to the extreme right. Where D is standing in?

a. Between C and E b. Between A and B

c. Between A and E d. None of the above

Ans: b. Between A and B

10: Four motor cars of different colours are parked in a line. Red colour car is in between maroon and white cars. Black colour car is to the immediate right of white car. In which place, the maroon colour car is parked in the order from left?

a. First Place b. Second Place c. Fourth Place

d. None of the above

Ans: a. First Place

Unit III - Logical Reasoning

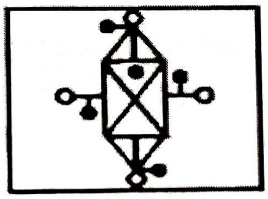
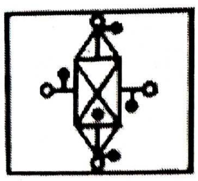
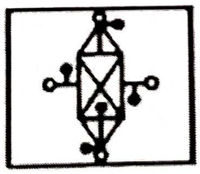
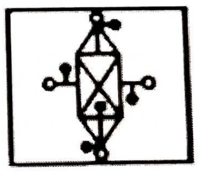
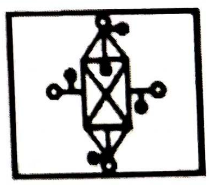
Chapter 11 – Water Images

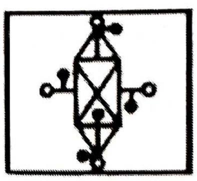
1: Choose the alternative which is closely resembles the water-image of the given combination.

Question Image	**U S 9 1 Q 4 M 5 W 3**		
a.	**b.**	**c.**	**d.**
			

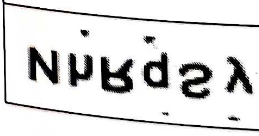
Answer: d. 

2: Find the correct Water Image of the Figure.

Question Image			
			
a.	**b.**	**c.**	**d.**
			

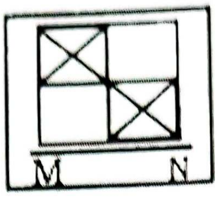
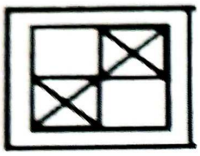
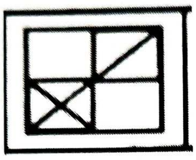
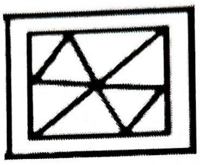
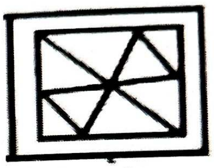
Ans: c. 

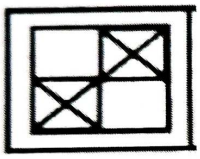
3: Choose the alternative which is closely resembles the water-image of the given combination.

Question Image	**N h R q S y**		
a.	**b.**	**c.**	**d.**
			

Answer: d. 

4: Find the Water Image of Given Figure below

Question Image			
			
a.	b.	c.	d.
			

Ans: a. 

5: From the following choose the alternative that correctly represents the water image of the word

Question Image	N U C L E A R		
a.	b.	c.	d.
			

Ans: d. 

6. Choose the alternative which is closely resembles the water-image of the given combination.

Question Image	A N S 4 3 Q 1 2		
a.	b.	c.	d.
			

Ans: b. 

7. Find the mirror image of the word "LOGIC."

a. CIGOL	b. CGIOL	c. CILGO	d. CIGLO

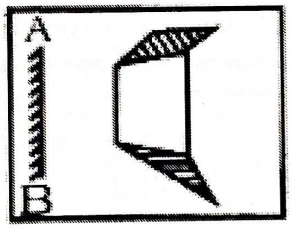
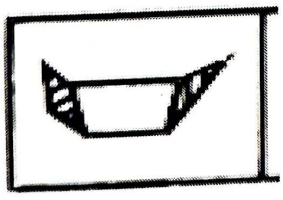
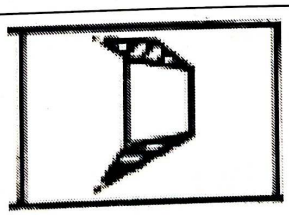
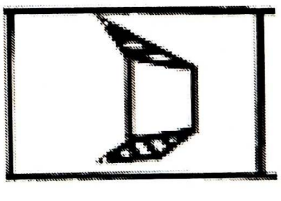
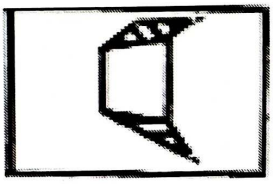
Ans: a. CIGOL

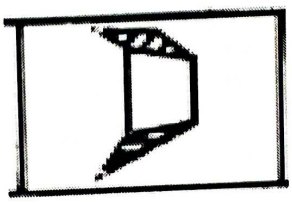
8. Choose the alternative which is closely resembles the water-image of the given combination.

Question Image	E F F E C T I V E		
a.	b.	c.	d.
ƎVITƆƎ⅁⅁Ǝ	EVITCEFFE	Ǝ⅁⅁ƎƆTIVƎ	ƎVITƆƎ⅁⅁Ǝ

Ans: a. ƎVITƆƎ⅁⅁Ǝ

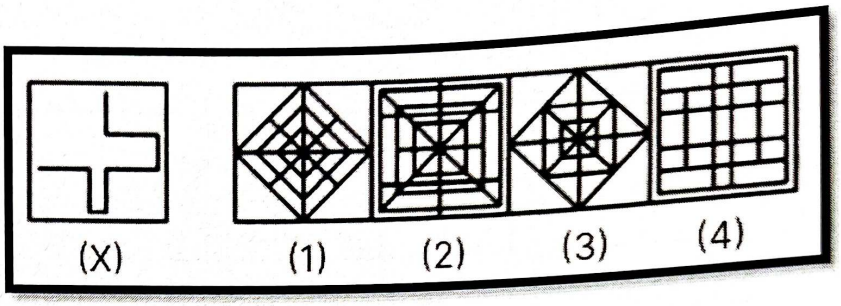
9. Choose the correct mirror image from the given question

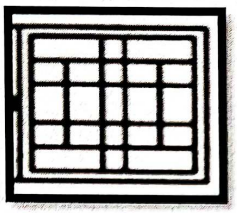
Question Image			
			
a.	b.	c.	d.
			

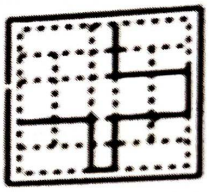
Ans: b. 

Chapter 12 – Embedded Figures.

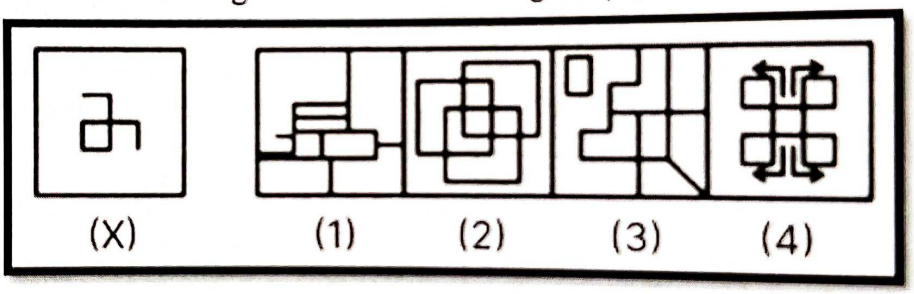
1. Find out the alternative figure which contains figure (X) as its part.

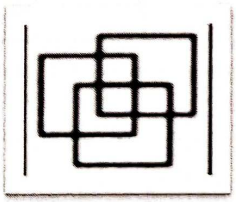


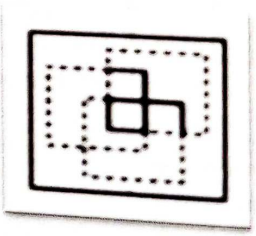
Ans: 4 

Solution: 

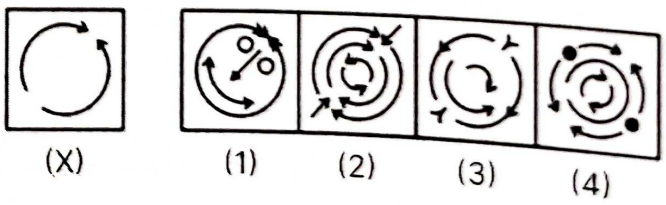
2. Find out the alternative figure which contains figure (X) as its part.



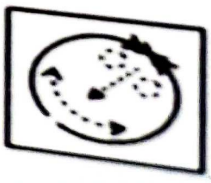
Ans: 2. 

Solution: 

3. Find out the alternative figure which contains figure (X) as its part.

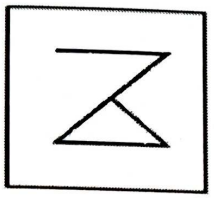


Ans: 1. 

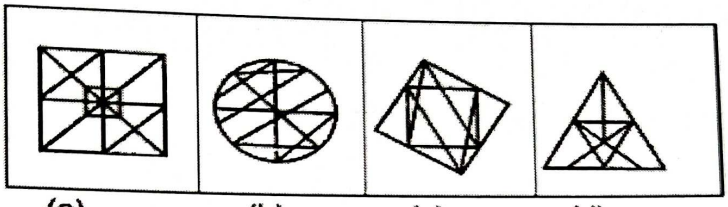
Solution: 

4. Find out the answer figure in which the given question figures is embedded.

Question Figure

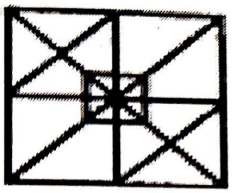


Answer Figures

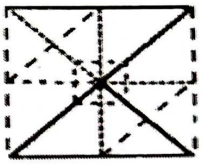


(a) (b) (c) (d)

Ans: a.

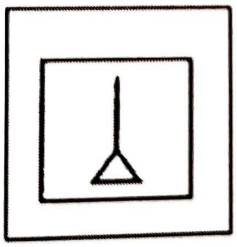


Solution:

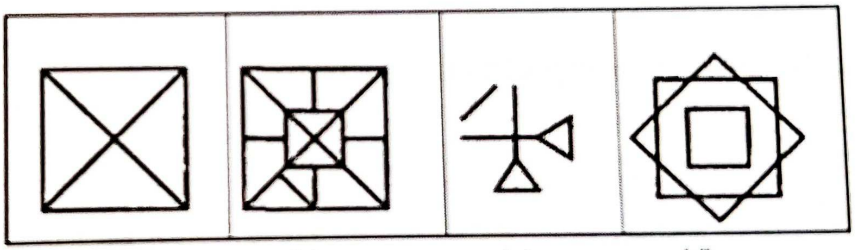


5. Find out the answer figure in which the given question figures is embedded.

Question Figure

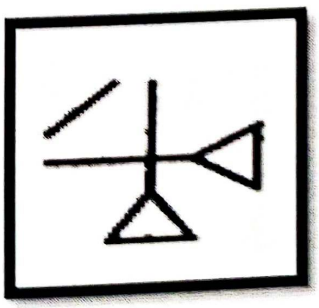


Answer Figures

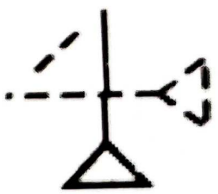


(a) (b) (c) (d)

Ans: c.

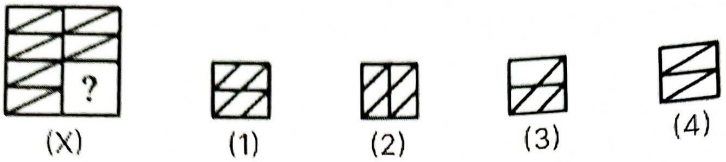


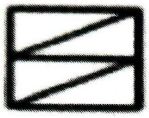
Solution:

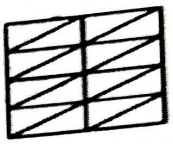


Chapter 13 – Completion of Pattern.

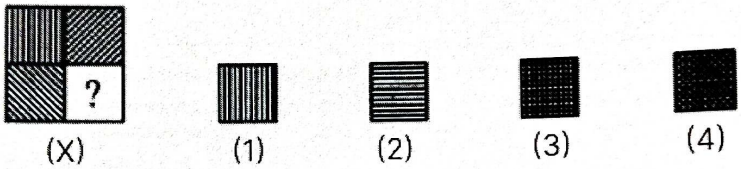
1. Identify the figure that completes the pattern



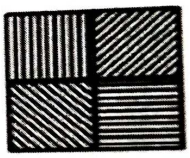
Ans: 4. 

Solution: 

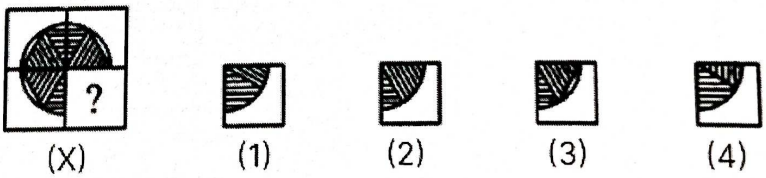
2. Identify the figure that completes the pattern



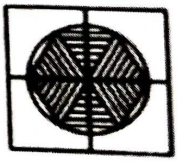
Ans: 2. 

Solution: 

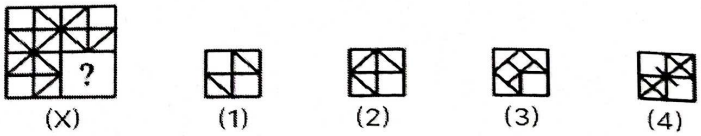
3. Identify the figure that completes the pattern

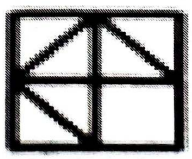


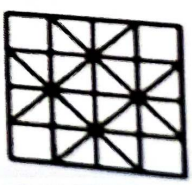
Ans: 3. 

Solution: 

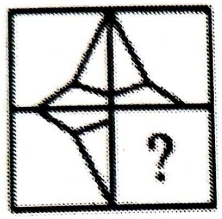
4. Identify the figure that completes the pattern



Ans: 2. 

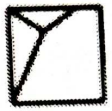
Solution: 

5. Identify the figure that completes the pattern



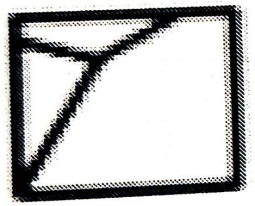

(1)


(2)

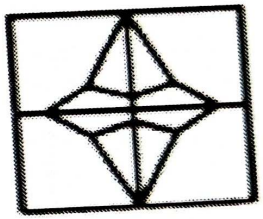

(3)


(4)

Ans: 4.



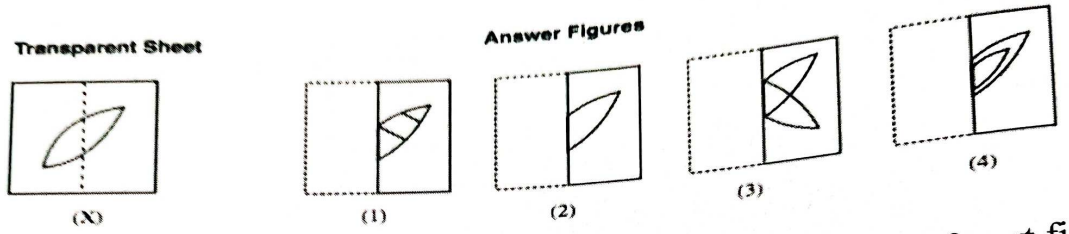
Solution:



Unit III - Logical Reasoning

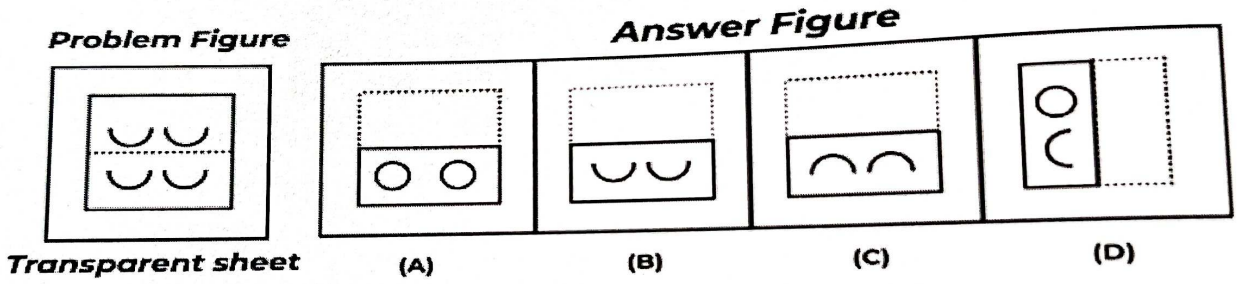
Chapter 14 – Paper Folding.

1. Find the pattern which will appear on the transparent sheet after it is folded along the dotted line



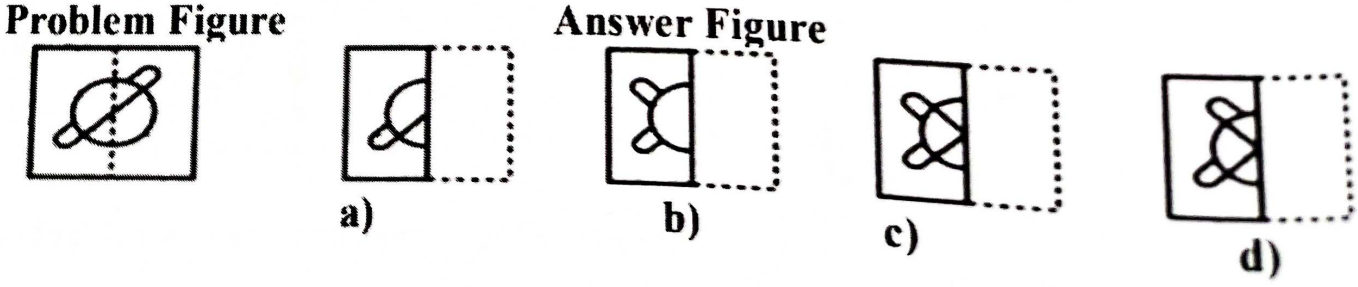
Ans: 3. If you fold the paper from left to right from dotted line, the left part figure will go in opposite direction. Thus, figure (3) is the correct figure.

2. Figure out from amongst the four alternatives how the pattern would appear when the transparent sheet is folded at the dotted line



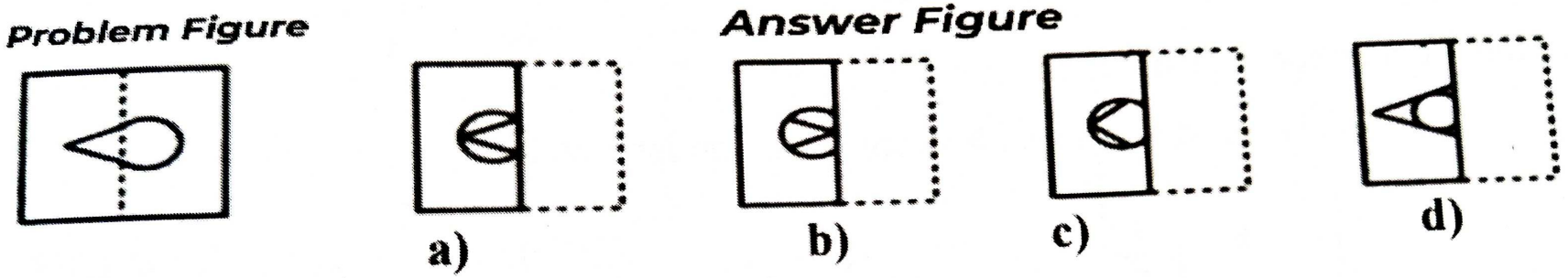
Ans: A. The first half of the paper will complete the circle in the second half. When the upper part of the square sheet is folded downward part of the semi-circle gets inverted and both form a circle.

3. Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line



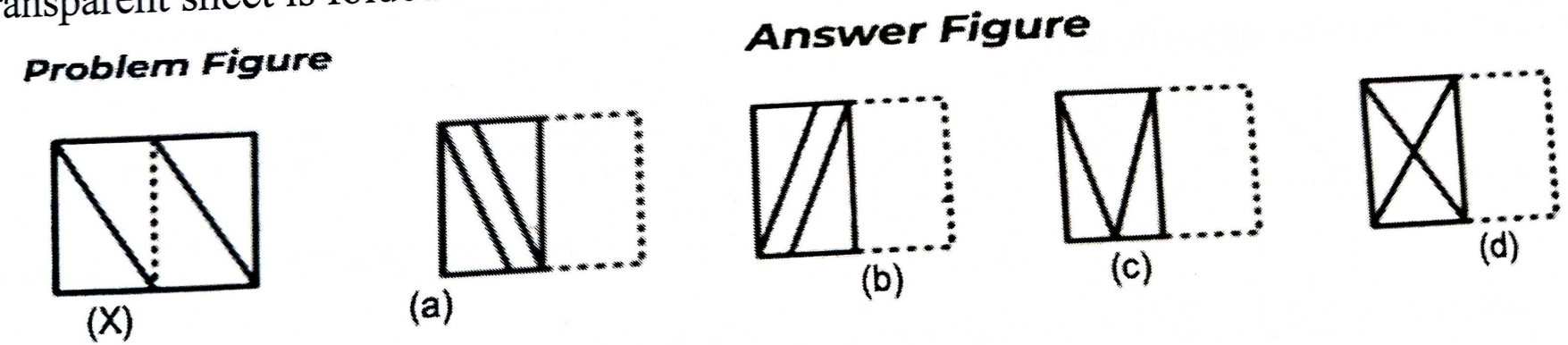
Ans: d.

4. Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.



Ans: a.

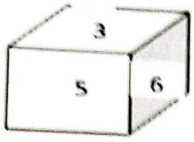
5. Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.



Ans: d.

Chapter 15 – Cubes and Dice.

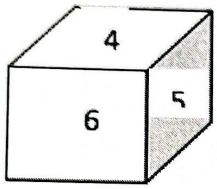
1. Find the number opposite to 3



a. 2 b. 4 c. 1 d. None of the above

Ans: b. 4: Sum of opposite side in standard dice must be equal to 7 (3+4=7).

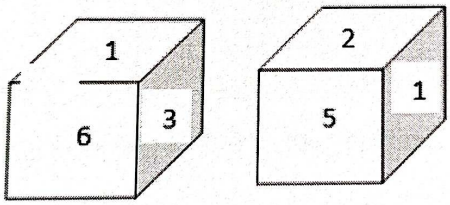
2: Find the number opposite to 3



a. 5 b. 4 c. 6 d. None of the above

Ans: a. 5. Sum of opposite side in standard dice must be equal to 7 (2+5=7)

3: What number will be opposite to 6



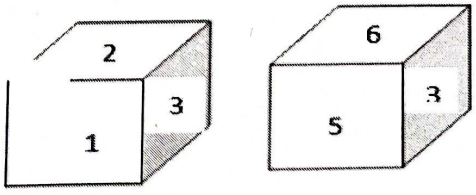
a. 2 b. 4 c. 6 d. None of the above

Answer: a. 2. 1 is common in both the dices, so putting 1 as constant we have to rotate two dices by clock wise / anticlockwise direction.

1 3 6

1 5 2 We get opposite side as 2

4: What number will be opposite to 3



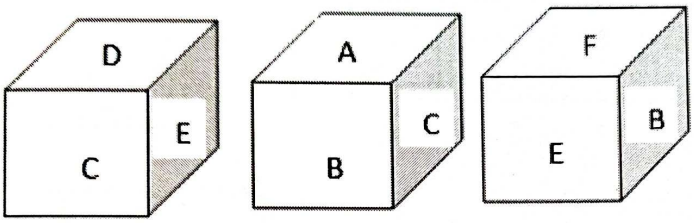
a. 2 b. 4 c. 6 d. None of the above

Ans: b. 4: 3 is common in both the dices, so putting 3 as constant we have to rotate both the dice by clock wise / anticlockwise direction.

3 1 2

3 5 6 we get opposite side as 4 because 4 is not visible

5: Find the alphabet opposite to 'C'



a. F b. C c. D d. A

Ans: a. F: Compare any two dice.

When we compare 1st and 2nd dice C is common in both the dices, so putting C as constant we have to rotate both the dice by clock wise anticlockwise direction.

C D E

C B A we get opposite side as F because F is not visible

OR

When we compare 2nd and 3rd dice B is common in both the dices, so putting B as constant we have to rotate both the dice by clock wise anticlockwise direction.

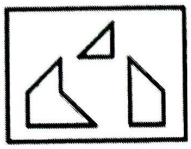
B A C

B E F we get opposite side as F

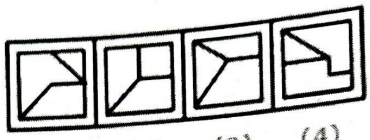
Unit III - Logical Reasoning

Chapter 16 – Figure Formation and Analysis.

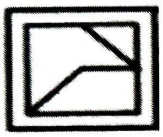
1. Find out which of the figures (1), (2), (3) and (4) can be formed from the pieces given in figure (X).



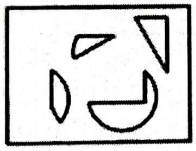
(X)



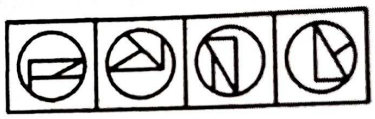
(1) (2) (3) (4)

Ans: 1. 

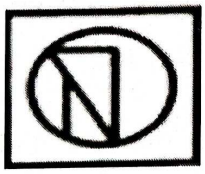
2. Find out which of the figures (1), (2), (3) and (4) can be formed from the pieces given in figure (X).



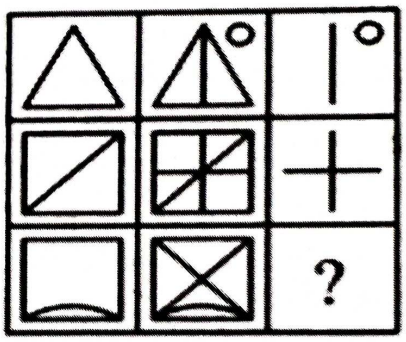
(X)

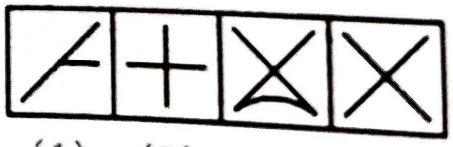


(1) (2) (3) (4)

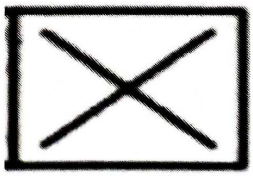
Ans: 3. 

3. Select a suitable figure from the four alternatives that would complete the figure matrix.



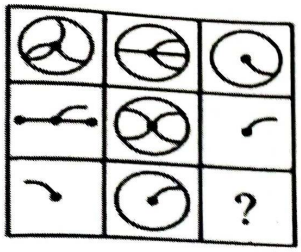


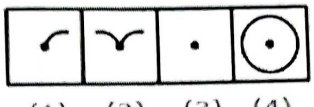
(1) (2) (3) (4)

Ans: 4. 

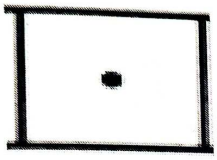
Solution: The third figure in each row comprises of parts which are not common to the first two figures.

4. Select a suitable figure from the four alternatives that would complete the figure matrix.



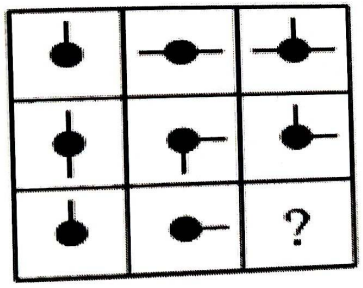


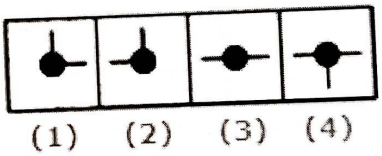
Ans: 3.



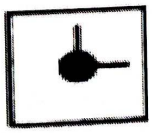
Solution: The third figure in each row comprises of the parts common to the first two figures.

5. Select a suitable figure from the four alternatives that would complete the figure matrix.



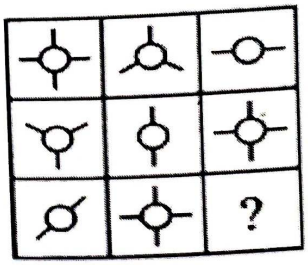


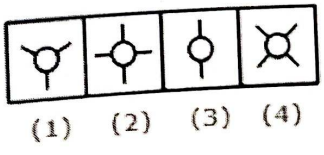
Ans: a.



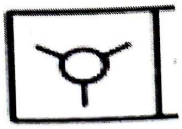
Solution: In each row, the third figure comprises of a black circle and only those line segments which are common to the first and the second figures.

6. Select a suitable figure from the four alternatives that would complete the figure matrix.



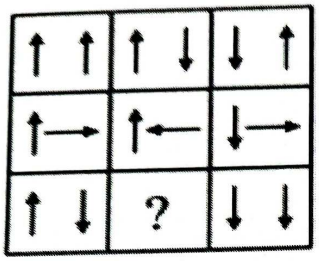


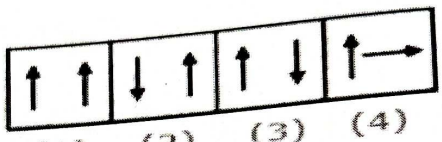
Ans: 1.



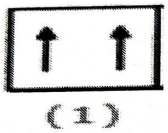
Solution: Each row (as well as each column) contains a figure consisting of a circle and two-line segments, a figure consisting of a circle and three-line segments and a figure consisting of a circle and four-line segments.

7. Select a suitable figure from the four alternatives that would complete the figure matrix.



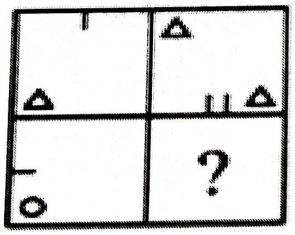


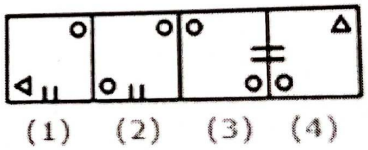
Ans: 1.



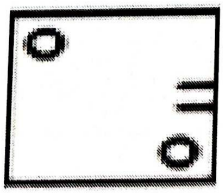
Solution: In each row, the second figure is obtained from the first figure by reversing the direction of the RHS arrow and the third figure is obtained from the second figure by reversing the direction of both the arrows.

8. Select a suitable figure from the four alternatives that would complete the figure matrix.





Ans: 3.

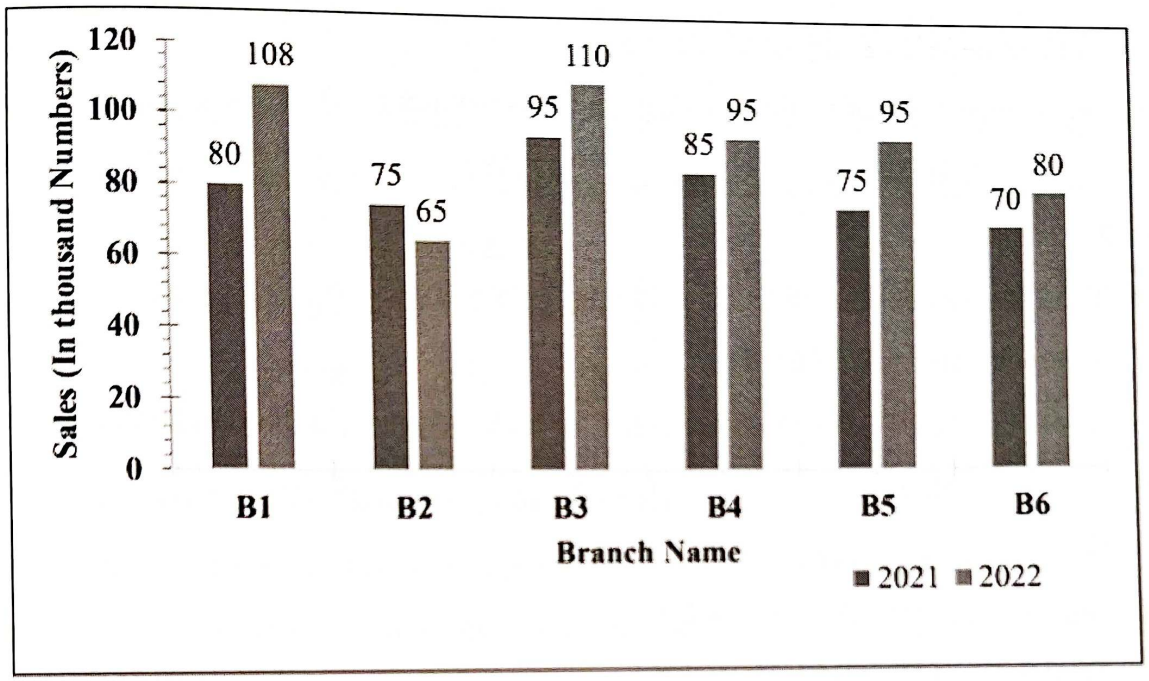


Solution: The second figure is obtained from the first figure by moving the line segment to the opposite side of the square boundary and replacing it with two similar line segments. Also, the element in the lower-left corner gets replaced by two similar elements - one placed in the upper-left and the other placed in the lower-right corner.

Unit III - Logical Reasoning

Chapter 17 - Data Analysis

Directions (1-5): The bar graph given below shows the sales of books (in thousand number) from six branches of a publishing company during two consecutive years 2021 and 2022? Sales of Books (in thousand numbers) from Six Branches – B1, B2, B3, B4, B5 and B6 of a publishing Company in 2021 and 2022



1. What is the ratio of the total sales of branch B2 for both years to the total sales of branch B4 for both years?

A. 2:3 B. 3:5 C. 4:5 D. 7:9

Ans: D. 7:9

Solution: Total Sales of Branch B2 = 75 + 65 = 140

Total Sales of Branch B4 = 85 + 95 = 180

Ratio = 140 : 180 = 7 : 9

2. Total sales of branch B5 for 2021 is what percent of the total sales of branches B6 for both the years?

A. 75 % B. 50% C. 25% D. 30%

Ans: B. 50%

Solution: Total Sales of B5 for 2021 = 75

Total Sales of B6 = 70 + 80 = 150

Percentage = B5 for 2021 / Total sales B6 × 100

= 75 / 150 × 100 = 50%

3. What is the difference of the average sales of branches B4 and B5 for both the years in thousands?

A. 10 B. 15 C. 5 D. 20

Ans: C. 5

Solution: Average Sales of B4 = (85 + 95)/2 = 90

Average Sales of B5 = (75 + 95)/2 = 85

Difference in B4 & B5 = 90 – 85 = 5

4. What is the average sales of all the branches (in thousand numbers) for the year 2021?

A. 73 B. 80 C. 83 D. 88

Ans: B. 80

Solution: Total Sales for 2021 = (80 + 75 + 95 + 85 + 75 + 70) = 480

Average Sales = 480 / 6 = 80

5. Total sales of branches B1, B3 and B5 together for both the years (in thousand numbers) is?

A. 250 B. 310 C. 435 D. 563

Ans: D. 563

Solution: Total Sales of B1 = 80 + 108 = 188

Total Sales of B3 = 95 + 110 = 205

Total Sales of B5 = 75 + 95 = 170

Total Sales of B1, B3 & B5 = 188 + 205 + 170

= 563

Unit III - Logical Reasoning

Chapter 18 - Data Sufficiency

Directions for data sufficiency questions (1-10):

A. Data in the statement I alone is sufficient to answer the question.

B. Data in the statement II alone is sufficient to answer the question.

C. Data either in the statement I alone or statement II alone are sufficient to answer the question.

D. Data given in both I & II together are not sufficient to answer the question.

E. Data in both statements I & II together are necessary to answer the question.

1. Who is taller among P, Q, R, S & T?

Statement I: S is shorter than Q. P is shorter than only T

Statement II: Q is taller than only S. T is taller than P and R

Ans: C.

2. What is the distance between point P and point Q?

Statement I: Point R is 10 m west of point P and point S is 10 m north of point P.

Statement II: Point Q is 10 m south-east of point R. Point S is 20 m north-west of point Q.

Ans.: D

3: What is Monica's position with respect to Rahul?

Statement I: In a row of 25 students, Monica is sitting 12th from right end of row and Rahul is sitting 20^{th} from left end of the row.

Statement II: Monica is 4th from right end and Rahul is 8th from left end.

Ans: A.

4: Who has secured less marks among P, Q, R, S & T?

Statement I: S has secured less marks than only R and T.

Statement II: Q secured more marks than P.

Ans: A.

5: Amit is facing which direction?

Statement I: Shikha is facing east direction and if she turns to her right, she will face Raj.

Statement II: Amit is facing opposite direction as that of Kiran who is facing Shikha.

Ans: D.

6: How much was the total sale of the company?

Statement I: The company sold 8000 units of product A each costing Rs. 25.

Statement II: This company has no other product line.

Ans: E

7: On which date in August was Kapil born?

Statement I: Kapil's mother remembers that Kapil was born before nineteenth but after fifteenth.

Statement II: Kapil's brother remembers that Kapil was born before seventeenth but after twelfth.

Ans: E

8: What is the shortest distance between Devipur and Durgapur?

Statement I: Durgapur is 20 kms away from Rampur.

Statement II: Devipur is 15 kms away from Rampur.

Ans: D - Clearly, the distance of each village from Rampur is given in I and II. But nothing about their relative positions is mentioned. So, the distance between the two villages cannot be calculated.

9: On which day in April is Gautam's birthday?

Statement I: Gautam was born exactly 28 years after his mother was born.

Statement II: His mother will be 55 years 4 months and 5 days on April 18 this year.

Answer: E - Clearly, the birthday of Gautam's mother can be found out from II and then Gautam's birthday can be determined using the fact given in I.

10: What will be the total weight of 10 poles, each of the same weight?

Statement I: One-fourth of the weight of each pole is 5 kg.

Statement II: The total weight of three poles is 20 kilograms more than the total weight of two poles.

Ans: C

Unit III - Logical Reasoning

Chapter 19 – Decision Making

Directions for questions 1 to 5: A famous retail electronics showroom chain has six new mobile phone models - T, V, W, X, Y, and Z – each equipped with at least one of the following three options: digital camera, music player, and office document viewer. No mobile has any other option. The following conditions apply:

V features both a digital camera and an office document viewer.

W has digital camera and music player

W and Y have no options in common.

X has more options as compared to W

V and Z have exactly one option in common

T has fewer options as compared to Z.

1: For exactly how many of the six mobile phones is it possible to determine exactly which option each one has?

a. Two b. Three c. Four d. Five

Ans: c. Four.

2: Which one of the following must be false?

a. Exactly five mobile phones feature a music player.

b. Exactly five mobile phones feature a document viewer.

c. Exactly four mobile phones feature a music player.

d. Exactly four mobile phones feature a document viewer.

Ans: a. Exactly five mobile phones feature a music player.

3: If Z has no option in common with T but has at least one option in common with every other mobile phone, then which one of the following must be false?

a. T has digital camera b. Z has document viewer

c. Exactly four of the six mobile phones have document viewer.

d. Exactly four of the six mobile phones have music player

Ans: d. Exactly four of the six mobile phones have music player

4: Suppose no two mobile phone models have exactly the same options as one another. In that case each of the following could be true EXCEPT:

a. Exactly three of the six mobile phones have digital camera.

b. Exactly three of the six mobile phones have document viewer.

c. Exactly four of the six mobile phones have document viewer.

d. Exactly four of the six mobile phones have music player.

Ans: b. Exactly three of the six mobile phones have document viewer.

5: Which one of the following must be True?

a. Exactly five mobile phones feature a music player.

b. Exactly two mobile phones feature a document viewer.

c. Exactly four mobile phones feature a document viewer.

d. None of these

Answer: c. Exactly four mobile phones feature a document viewer.

Directions for questions 6 to 10: Following are the conditions for admission to an ngineering college. A student should

a. be a of minimum 18 years of age as of 1.7.2000.

b. has secured at least 50% marks in Standard XII.

c. has secured at least 60% marks in the entrance exam.

d. be ready to pay Rs. 20,000 at the time of admission.

A student who fulfils all conditions except:

a. At 2 above, but has secured 80% marks in the entrance exam, case to be referred to President,

Admission.

b. At four above, but can pay at least Rs. 10,000 at the time of admission, case to be referred to the Dean of the College.

Based on the above conditions and information provided in each of the questions below, decide the course of action in each case. These cases are given to you as of 1.12.2000.

6: Shekhar Agarwal has secured 58 per cent and 85 per cent marks in XII Std and in the entrance test respectively. He was born on 11 January 1982. He can pay Rs. 20,000 at the time of admission.

a. Student is to be admitted.

b. Case is to be referred to the President, Admission.

c. Case is to be referred to the Dean of the College.

d. Data are not adequate to make the decision.

e. Student is not to be admitted.

Ans: a. the student is to be admitted

7: Sheela Dixit has secured 75 per cent and 80 per cent marks in the XII std and in the entrance test respectively. She can pay Rs. 10,000 at the time of admission and was born on 15 June 1982.

a. Student is to be admitted.

b. Case is to be referred to the President, Admission.

c. Case is to be referred to the Dean of the College.

d. Data are not adequate to make the decision.

e. Student is not to be admitted.

Ans: c. Case is to be referred to the Dean of the College.

8: Ashok Paranjpe was born on 17 January 1982. He has secured 65 per cent and 75 per cent marks in XII Std and in the entrance test respectively. He can pay Rs. 15,000 at the time of admission.

a. Student is to be admitted.

b. Case is to be referred to the President, Admission.

c. Case is to be referred to the Dean of the College.

d. Data are not adequate to make the decision.

e. Student is not to be admitted.

Ans: c. Case is to be referred to the Dean of the College.

9: Aruna Nadkarni can pay Rs. 20,000 at the time of admission and has secured 60 per cent and 70 per cent marks in graduation and in the entrance test respectively. She was born on 5 April 1981.

a. Student is to be admitted.

b. Case is to be referred to the President, Admission.

c. Case is to be referred to the Dean of the College.

d. Data are not adequate to make the decision.

e. Student is not to be admitted.

Answer: d. Data are not adequate to make the decision.

10: Rita Jha was born on 12 June 1980. She can pay Rs. 20,000 at the time of admission. She has secured 45 per cent and 85 per cent marks in XII Std and in the entrance test respectively.

a. Student is to be admitted.

b. Case is to be referred to the President, Admission.

c. Case is to be referred to the Dean of the College.

d. Data are not adequate to make the decision.

e. Student is not to be admitted.

Ans: b. Case is to be referred to the President, Admission.