

AIRTHMETICAL REASONING

1. There are some benches in a classroom. If 4 students sit on each bench, then 3 benches are left unoccupied. However, if 3 students sit on each bench, 3 students are left standing. How many students are there in the class ?
(a) 36 (b) 48 (c) 56 (d) 64
2. A, B, C and D play a game of cards. A says to B, "If I give you 8 cards, you will have as many as C has and I shall have 3 less than what C has. Also, if I take 6 cards from C, I shall have twice as many as D has". If B and D together have 50 cards, how many cards has C got ?
(a) 40 (b) 37 (c) 27 (d) 23
3. From a number of apples, a man sells half the number of existing apples plus 1 to the first customer, sells $\frac{1}{3}$ rd of the remaining apples plus 1 to the second customer and $\frac{1}{5}$ th of the remaining apples plus 1 to the third customer. He then finds that he has 3 apples left. How many apples did he have originally ?
(a) 15 (b) 18 (c) 20 (d) 25
4. A shepherd had 17 sheep. All but nine died. How many was he left with ?
(a) Nil (b) 8 (c) 9 (d) 17
5. 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
6. In a garden, there are 10 rows and 12 columns of mango trees. The distance between the two trees is 2 metres and a distance of one metre is left from all sides of the boundary of the garden. The length of the garden is
(a) 20m (b) 22m (c) 24m (d) 26m
7. In a city, 40% of the adults are illiterate while 85% of the children are literate. If the ratio of the adults to that of the children is 2 : 3, then what percent of the population is literate ?
(a) 20% (b) 25% (c) 50% (d) 75%
8. A bus starts from city X. The number of women in the bus is half of the number of men. In city Y, 10 men leave the bus and five women enter. Now, number of men and women is equal. In the beginning, how many passengers entered the bus ?
(a) 15 (b) 30 (c) 36 (d) 45
9. A total of 324 coins of 20 paise and 25 paise make a sum of Rs. 71. The number of 25-paise coins is ?
(a) 120 (b) 124 (c) 144 (d) 200
10. In a family, each daughter has the same number of brothers as she has sisters and each son has twice as many sisters as he has brothers. How many sons are there in the family ?
(a) 2 (b) 3 (c) 4 (d) 5
11. A player holds 13 cards of four suits, of which seven are black and six are red. There are twice as many diamonds as spades and twice as many hearts as diamonds. How many clubs does he hold ?
(a) 4 (b) 5 (c) 6 (d) 7
12. A father tells his son, "I was of your present age when you were born". If the father is 36 now, how old was the boy five years back ?
(a) 13 (b) 15 (c) 17 (d) 20
13. 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
14. In a group of 15 people, 7 read French, 8 read English while 3 of them read none of these two. How many of them read French and English both ?
(a) 0 (b) 3 (c) 4 (d) 5
15. If 100 cats kill 100 mice in 100 days, then 4 cats would kill 4 mice in how many days ?
(a) 1 day (b) 4 days (c) 40 days (d) 100 days
16. 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
17. A pineapple costs Rs. 7 each. A watermelon costs Rs. 5 each. X spends Rs. 38 on these fruits. The number of pineapples purchased is
(a) 2 (b) 3
(c) 4 (d) Data inadequate
18. The number of boys in a class is three times the number of girls. Which one of the following numbers cannot represent the total number of children in the class ?
(a) 48 (b) 44 (c) 42 (d) 40
19. A student got twice as many sums wrong as he got right. If he attempted 48 sums in all, how many did he solve correctly ?
(a) 12 (b) 16 (c) 18 (d) 24
20. At the end of a business conference the ten people present all shake hands with each other once. How many handshakes will there be altogether ?
(a) 20 (b) 45 (c) 55 (d) 90

1. (b) Let there be x students in the class.

When 4 students sit on each bench, number of benches

$$= \left(\frac{x}{4} + 3 \right)$$

When 3 students sit on each bench, number of benches

$$= \left(\frac{x-3}{3} \right)$$

$$\therefore \frac{x}{4} + 3 = \frac{(x-3)}{3} \Leftrightarrow 3x + 36 = 4x - 12 \Leftrightarrow x = 48$$

Hence, number of students in the class = 48.

2. (a) Clearly, we have :

$$B + 8 = C \quad \dots(i)$$

$$A - 8 = C - 3 \quad \dots(ii)$$

$$A + 6 = 2D \quad \dots(iii)$$

$$B + D = 50 \quad \dots(iv)$$

Putting $C = A - 5$ from (ii) into (i), we have :

$$B + 8 = A - 5 \text{ or } A - B = 13 \quad \dots(v)$$

Putting $D = 50 - B$ from (iv) into (iii), we have :

$$A + 6 = 100 - 2B \text{ or } A + 2B = 94 \quad \dots(vi)$$

Solving (v) and (vi), we get : $B = 27$ and $A = 40$

\therefore A has 40 cards.

3. (c) Let the total number of apples be x . Then,

Apples sold to 1st customer = $\left(\frac{x}{2} + 1 \right)$. Remaining apples

$$= x - \left(\frac{x}{2} + 1 \right) = \left(\frac{x}{2} - 1 \right)$$

Apples sold to 2nd customer

$$= \frac{1}{3} \left(\frac{x}{2} - 1 \right) + 1 = \frac{x}{6} - \frac{1}{3} + 1 = \left(\frac{x}{6} + \frac{2}{3} \right)$$

Remaining apples

$$= \left(\frac{x}{2} - 1 \right) - \left(\frac{x}{6} + \frac{2}{3} \right) = \left(\frac{x}{2} - \frac{x}{6} \right) - \left(1 + \frac{2}{3} \right) = \left(\frac{x}{3} - \frac{5}{3} \right)$$

Apples sold to 3rd customer

$$= \frac{1}{5} \left(\frac{x}{3} - \frac{5}{3} \right) + 1 = \left(\frac{x}{15} + \frac{2}{3} \right)$$

Remaining apples

$$= \left(\frac{x}{3} - \frac{5}{3} \right) - \left(\frac{x}{15} + \frac{2}{3} \right) = \left(\frac{x}{3} - \frac{x}{15} \right) - \left(\frac{5}{3} + \frac{2}{3} \right) = \left(\frac{4x}{15} - \frac{7}{3} \right)$$

$$\therefore \frac{4x}{15} - \frac{7}{3} = 3 \Leftrightarrow \frac{4x}{15} = \frac{16}{3}$$

$$\Leftrightarrow x = \left(\frac{16}{3} \times \frac{15}{4} \right) = 20$$

- 4 (c) 'All but nine died' means 'All except nine died' i.e. 9 sheep remainder alive.

- 5 (c) Clearly, 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 = $10 + 10 = 20$.

6. (b) Each row contains 12 plants.

Leaving 2 corner plants, 10 plants in between have (10×2) metres and 1 metre on each side is left.

$$\therefore \text{Length} = (20 + 2)m = 22m.$$

7. (d) Let the number of adults and children be $2x$ and $3x$ respectively.

Then, literate population = $(100 - 40)\%$ of $2x + 85\%$ of $3x$

$$= \left(\frac{60}{100} \times 2x \right) + \left(\frac{85}{100} \times 3x \right) = \frac{6x}{5} + \frac{51x}{20} = \frac{75x}{20}$$

$$\therefore \text{Required percentage} = \left(\frac{75x}{20} \times \frac{1}{5x} \times 100 \right)\% = 75\%.$$

8. (d) Originally, let number of women = x . Then, number of men = $2x$. So in city Y, we have : $(2x - 10) = (x + 5)$ or $x = 15$.

\therefore Total number of passengers in the beginning

$$= (x + 2x) = 3x = 45$$

9. (b) Let the number of 20-paise coins be x . Then, number of 25-paise coins = $(325 - x)$.

$$\therefore 0.20 \times x + 0.25(324 - x) = 71$$

$$\Leftrightarrow 20x + 25(324 - x) = 7100$$

$$\Leftrightarrow 5x = 100 \Leftrightarrow x = 200.$$

Hence, number of 25-paise coins = $(324 - x) = 124$.

10. (b) Let d and s represent the number of daughters and sons respectively. Then, we have : $d - 1 = s$ and $2(s - 1) = d$.

Solving these two equations, we get ; $d = 4, s = 3$.

11. (c) Clearly, the black cards are either clubs or spades while the red cards are either diamonds or hearts.

Let the number of spades be x . Then, number of clubs = $(7 - x)$.

Number of diamonds = 25 number of spades = $2x$;

Number of hearts = 2 \times number of diamonds = $4x$.

Total number of cards = $x + 2x + 4x + 7 - x = 6x + 7$.

$$\therefore 6x + 7 = 13 \Leftrightarrow 6x = 6 \Leftrightarrow x = 1.$$

Hence, number of clubs = $(7 - x) = 6$.

- 12 (a) Let the father's age be x and the son's age be y . Then,

$$x - y = y \text{ or } x = 2y.$$

Now, $x = 36$, So, $2y = 36$ or $y = 18$.

\therefore Son's present age = 18 years. So, son's age 5 years ago = 13 years.

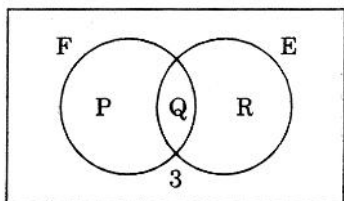
- 13 (b) Manick's present age = 12 years, Rahul's present age = 4 years.

Let Manick be twice as old as Rahul after x years from now. Then,

$$12 + x = 2(4 + x) \Leftrightarrow 12 + x = 8 + 2x \Leftrightarrow x = 4.$$

Hence, Manick's required age = $12 + x = 16$ years.

14. (b) Let circles F and E represent people who read French and English respectively.



Now, $(P + Q + R) + 3 = 15$ or $P + Q + R = 12$ (i)

Also, $P + Q = 7$, $Q + R = 8$,

Adding, we get : $P + 2Q + R = 15$ (ii)

Subtracting (i) from (ii), we get $Q = 3$.

\therefore Number of people who read French and English both = 3.

15. (d) Less cats, more days (Indirect Proportion)

Less mice, less days (Direct Proportion)

Let the required number of days be x .

$$\begin{array}{lcl} \text{Cat} & 4 & : 100 \\ \text{Mice} & 100 & : 4 \end{array} \quad \left. \vphantom{\begin{array}{lcl} \text{Cat} & 4 & : 100 \\ \text{Mice} & 100 & : 4 \end{array}} \right\} \therefore x : 100$$

$$\therefore 100 \times 4 \times x = 4 \times 100 \times 100 \text{ or } x = \left(\frac{4 \times 100 \times 100}{100 \times 4} \right) = 100$$

16. (b) Since each pole at the corner of the plot is common to its two sides, so we have : Total number of poles needed
 $= 27 \times 44 - 4 = 108 - 4 = 104$.

17. (c) Let the number of pineapples and watermelons be x and y respectively.

$$\text{Then, } 7x + 5y = 38 \text{ or } 5y = (38 - 7x) \text{ or } y = \frac{38 - 7x}{5}$$

Clearly, y is a whole number, only when $(38 - 7x)$ is divisible by 5. This happens when $x = 4$.

18. (c) Let number of girls = x and number of boys = $3x$.

Then, $3x + x = 4x =$ total number of students.

Thus, to find exact value of x , the total number of students must be divisible by 4.

19. (b) Suppose the boy got x sums right and $2x$ sums wrong. Then,

$$x + 2x = 48 \Leftrightarrow 3x + 48 \Leftrightarrow x = 16$$

20. (b) Clearly, total number of handshakes

$$= (9 + 8 + 7 + 6 + 5 + 4 + 3 + 2 + 1) = 45$$