14. Arithmetical Reasoning

This chapter of reasoning deals with general arithmetical problems common in nature. Solutions of these problems require common sense with slight amount of logical reasoning. We have dealt with the questions on arithmetical reasoning in detail in the following examples.

Solved Examples

1. The sum of the ages of a son and father is 56 years. After four years, the age of the father will be three times that of the son. Their ages respectively are

   (1) 12 years, 44 years   (2) 16 years, 42 years

   (3) 16 years, 48 years   (4) 18 years, 36 years

Sol. Let the age of the father be x, then the age of the son would be $(56 - x)$. After four years, the age of father would be $(x + 4)$ and that of son would be $(56 - x + 4)$ years. Now, from the information given in the question, we have

$(x + 4) = 3(56 - x + 4)$

$\Rightarrow x + 4 = 168 - 3x + 12 \Rightarrow 4x = 168 + 12 - 4 = 176 \Rightarrow x = 44$ years

Therefore, the age of father and son is 44 years and 12 years, respectively. Hence, the correct answer is (1).

2. In 10 years, A will be twice as old as B was 10 years ago. If at present A is 9 years older than B, the present age of B is

   (1) 19 years   (2) 29 years   (3) 39 years   (4) 49 years

Sol. Let the present age of B be x years.

Then, the present age of A would be $(x + 9)$ years.

After 10 years, the age of A would be $(x+9+10) = (x + 19)$ years and before then years, the age of B was $(x - 10)$ years. Now, from the information given in the question,

$(x + 19) = 2(x - 10)$

or $x + 19 = 2x - 20$ or $x = 19 + 20 = 39$ years

Therefore, the present age of B is 39 years. Hence, the correct answer is (3).

3. In a town, 65% people watch the news on television, 40% read a newspaper and 25% read a newspaper and watch the news on television also. What percentage of the people neither watch the news on television nor read a newspaper ?

   (1) 5%   (2) 10%   (3) 15%   (4) 20%

Sol. Let the total number of people be 100. Let circle A represents people who watched television and B represents people who read newspaper.
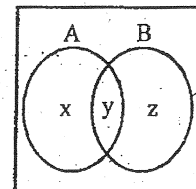
Then, x + y = 65,

$\quad$ y + z = 40, y = 25

We get,

$\quad$ x = 40,

$\quad$ y = 25,

$\quad$ z = 15

Then, the number of people who neither watched television nor read newspaper

$= 100 - (x + y + z)$

$= 100 - (40 + 25 + 15)$

$= 100 - 80 = 20$

Therefore, the required percentage is 20% Hence, the correct answer is (4).

4. 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 ?

(1) 0   (2) 3   (3) 4   (4) 5

Sol. Let circles x and y represent people who read French and English, respectively. Area A shows the people who read French only. Area B shows the people who read French and English both, Area C shows the people who read English only

Now, $(A + B + C) + 3 = 15$

or $A + B + C = 12$ ...(i)

and $A + B = 7$ ...(ii)

$B + C = 8$ ...(iii)

Adding these two, we get

$A + 2B + C = 15$ ...(iv)

Subtracting (i) from (ii), we get

$B = 15 - 12 = 3$

Therefore, number of people who read French and English both is 3. Hence, the correct answer is (2).

Putting (ii) is (i)
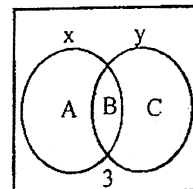
$7 + C = 12$

$C = 5$

from (iii)

$B + C = 8$

$B + 5 = 8$

$B = 3$

from (ii)

$A + 3 = 1$

$A = 4$.

EXERCISE

1. There are 50 students admitted to a nursery class. Some students can speak only English and some can speak only Hindi. Ten students can speak both English and Hindi. If the number of students who can speak English is 21, then how many students can speak Hindi, only Hindi and only English

   (1) 39, 29 and 11, respectively
   (2) 37, 27 and 13, respectively
   (3) 28, 18 and 22, respectively
   (4) 21, 11 and 29, respectively

2. Consider the Venn diagram given below
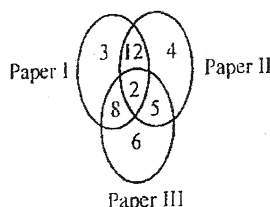
   The numbers in Venn diagram indicates the number of persons reading the newspapers. The diagram is drawn after surveying 50 persons. In a population of 10,000, how many can be expected to read at least two newspapers?

   (1) 5,000
   (2) 5,400
   (3) 6,000
   (4) 6,250

Directions for (Q.3 to Q.5) : These questions are based on the following information for an examination :

(A) Candidates appeared	10500
(B) Passed in all the five subjects	5685
(C) Passed in three subjects only	1498
(D) Passed in two subjects only	1250
(E) Passed in one subject only	835
(F) Failed in English only	78
(G) Failed in Mathematics only	275
(H) Failed in Physics only	149
(I) Failed in Chemistry only	147
(J) Failed in Biology only	221

3. How many candidates failed in all the subjects?

   (1) 4815
   (2) 3317
   (3) 2867
   (4) 362

4. How many candidates passed in at least four subjects ?

   (1) 6555
   (2) 5685
   (3) 1705
   (4) 870

5. How many candidates failed because of having failed in four or less subjects ?

   (1) 4815
   (2) 4453
   (3) 3618
   (4) 2368

6. 10 years ago, Chandravati's mother was 4 times older than her daughter. After 10 years, the mother will be twice older than the daughter. The present age of Chandravati is

   (1) 5 years
   (2) 10 years
   (3) 20 years
   (4) 30 years

7. The age of Arvind's father is 4 times of his age. If 5 years ago, father's age was 7 times of the age of his son, what is the age of Arvind's father at present ?

   (1) 35 years
   (2) 40 years
   (3) 70 years
   (4) 84 years

8. After five years, the age of a father will be thrice the age of his son, whereas five years ago, he was seven times old as his son was. What is father's present age ?

   (1) 35 years
   (2) 40 years
   (3) 45 years
   (4) 50

9. The age of a father 10 years ago was thrice the age of his son. Ten years later, the father's age will be twice that of his son. The ratio of their present ages is

(1) 8 : 5   (2) 7 : 3   (3) 5 : 2   (4) 9 : 5

10. I have a few sweets to be distributed. If I keep 2, 3 or 4 in a pack, I am left with one sweet. If I keep 5 in a pack, I am left with none. What is the minimum number of sweets I can have to pack and distribute ?

(1) 25   (2) 37   (3) 54   (4) 65

11. In a family, a couple has a son and a daughter. The age of the father is three times that of his daughter and the age of the son is half of his mother. The wife is 9 years younger to her husband and the brother is seven years older than his sister. What is the age of the mother?

(1) 40 years   (2) 50 years   (3) 45 years   (4) 60 years

12. A certain number of horses and an equal number of men are going somewhere. Half of the owners are on their horses while the remaining ones are walking along leading their horses. If the number of legs walking on the ground is 70, how many horses are there ?

(1) 10   (2) 12   (3) 14   (4) 16

13. In an examination, a student scores 4 marks for every correct answer and loses 1 mark for every wrong answer. If he attempts all 75 questions and secures 125 marks, the total number of questions he attempted correctly, is

(1) 35   (2) 40   (3) 42   (4) 46

14. Ravi's brother is 3 years senior to him. His father was 28 years of age when his sister born, while his mother was 26 years of age when he born. If his sister was 4 years of age when his brother was born, what was the age of Ravi's father and mother respectively when his brother was born ?

(1) 32 years, 23 years   (2) 32 years, 29 years

(3) 35 years, 29 years   (4) 35 years, 33 years

15. A man has a certain number of small boxes to pack into parcels. If he packs 3, 4, 5 or 6 in a parcel, he is left with one, if he packs 7 in a parcel, none is left over. What is the number of boxes, he may have to pack ?

(1) 106   (2) 301   (3) 309   (4) 400

EXERCISE   **ANSWER KEY**

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	1	2	4	1	2	3	2	2	2	1	4	3	2	1	2