IPMAT SAMPLE QUESTIONS
(EQUATION, RATIO, PROPORTION & VARIATION)

Q1. Recently my brother and I played chess form chocolates. Whoever lost the game gave the other a chocolate. After the last game we counted the chocolates. I had 20 more chocolates than I started with, although he won 7 games. There is no draw. How many games did we play?
a) 27   c) 37
b) 34   d) 54

Q2. Anand, Binoy, Chetan and Dharma together have Rs 47 with them. Anand and Binoy together have Rs 27; Chetan and Anand have Rs 25 and Dharma and Anand have Rs 23. How much money does Binoy have?
a) Rs 9   c) Rs 13
b) Rs 11   d) Rs 28

Q3. IIM Indore runs a Corporate Training Programme. At the end of running the first programme its total takings were Rs 38950. There were more than 45 but less than 100 particulars. What was the participant fee the programme?
a) Rs 410   c) Rs 500
b) Rs 450   d) Rs 510

Q4. Three friends had a dinner at a restaurant. When the bill was received Amita paid 2/3 as much as Veena paid and Veena paid 1/2 as much as Tanya paid. What fraction of the bill did Veena pay?
a) 1/3   c) 12/31
b) 3/11   d) 5/8

Q5. A man earns Rs 20 on the first day and spends Rs 15 on the next day. He again earns Rs 20 on the third day and spends Rs 15 on the fourth day. If he continues to save like this, how soon will he have Rs 60 in hand?
a) On 17th day   c) On 24th day
b) On 27th day   d) On 30th day

Q6. In a factory, each day the expected number of accidents is related to the number of overtime hour by a linear equation. Suppose that on one day there were 1000 overtime hours logged and 8 accidents reported and on another day there were 400 overtime hours logged and 5 accidents. What is the expected number of accidents when no overtime hours are logged?
a) 2   c) 4
b) 3   d) 5

Q7. A person buys 18 local tickets for Rs. 110. Each first class ticket costs Rs. 10 and each second class ticket costs Rs. 3. What will another lot of 18 tickets in which the number of first class and second class tickets are interchanged cost?
a) 112   c) 121
b) 118   d) 124

Q8. A bakery opened with its daily supply of 40 dozen rolls. Half of the rolls were sold by noon, and 60% of the remaining rolls were sold between noon and closing time. How many dozen rolls were left unsold?

1) 6   3) 10
2) 8   4) I2

Q9. Running at the same constant rate, 6 identical machines can produce a total of 180 bottles per hour. How many bottles could 15 such machines produce in 30 minutes?

a) 225   c) 250
b) 300   d) 350

Q10. The speed of scooter, car and train are in the ratio of 1 : 4 : 16. If all of them cover equal distance then the ratio of time taken/velocity for each of the vehicle is:

1) 256 : 16 : 1   3) 16 : 4 : 1
2) 1 : 4 : 16   4) 16 : 1 : 4

Q11. A, B, C and D purchased a restaurant for Rs. 56 lakhs. The contribution of B, C and D together is 460% that of A, alone. The contribution of A, C and D together is 366.66% that of B's contribution and the contribution of C is 40% that of A, B and D together. The amount contributed by D is:

a) 10 lakhs   c) 16 lakhs
b) 12 lakhs   d) 18 lakhs

Q12. Rs.73,689/- are divided between A and B in the ratio 4 :7. What is the difference between thrice the share of A and twice the share of B?

a) Rs.36,699   c) Rs.20,097
b) Rs.46893   d) Rs.13,398

Q13. A certain amount was to be distributed among A, B and C in the ratio 2 :3 :4 respectively, but was erroneously distributed in the ratio 7:2:5 respectively. As a result of this, B got Rs.40 less. What is the amount?

a) Rs.210   c) Rs.230
b) Rs.270   d) Rs.280

Q14. Kajal spends 55% of her monthly income on grocery, clothes and education in the ratio of 4 : 2 : 5 respectively. If the amount spent on clothes is Rs.5540/-, what is Kajal's monthly income?

a) Rs.55,400   c) Rs.55,450
b) Rs.54,500   d) Rs.55,650

Q15. The respective ratio between the present age of Manisha and Deepali is 5 : X. Manisha is 9 years younger than Parineeta. Parineeta's age after 9 years will be 33 years. The difference between Deepali's and Manisha's age is same as the present age of Parineeta. What will come in place of X?

a) 23   c) 15
b) 39   d) None of these

ANSWER KEY & SOLUTION:

1. Correct Answer: B
Solution:
I must have got 20 + 7 chocolates. So that even after giving 7 chocolates I have left with 20 additional chocolates.
Thus, I won 27 games and my brother won 7 games.
Total games = 34.

2. Correct Answer: C
Solution:
(c) $A + B + C + D = 47$
$A + B = 27$
$C + A = 25$
$D + A = 23$
$3A + B + C + D = 75$ [By adding above three equation
$\underline{A + B + C + D = 47}$
$2A \qquad = 28$
And $\quad B = 13$

3. Correct Answer: A
Solution:
Rs 38950 is not divisible by options (b), (c) or (d). Hence check through (a) = 38950/410 = 95.

4. Correct Answer: B
Solution:
(b) $\text{Tanya} + \text{Tanya} \times \dfrac{1}{2} + \text{Tanya} \times \dfrac{1}{2} \times \dfrac{2}{3} = 1$

$\Rightarrow T + \dfrac{T}{2} + \dfrac{T}{3} = 1 \Rightarrow 11T = 6$

$\text{Tanya pays} = \dfrac{6}{11} \text{ parts}$

$\text{Veena pays} = \dfrac{6}{11} \times \dfrac{1}{2} = \dfrac{3}{11} \text{ parts}$

$\text{Anita pays} = \dfrac{3}{11} \times \dfrac{6}{11} = \dfrac{2}{11}$

5. Correct Answer: A
Solution:
Every 2nd day he saves Rs 5. So on 16th day he has 8 × 5 = Rs 40
17th day he earns Rs 20 which gives him Rs 60.

6. Correct Answer: B
Solution:

(b) Suppose no. of accidents $y = a + bx$
Where x is no. of overtime hour
From the given data $y = 8$ for $x = 1000$ and $y = 5$ for $x = 400$

$\Rightarrow 8 = a + 1000b$ and $5 = a + 400b$, $\Rightarrow b = \dfrac{1}{200}, a = 3$

So, the relation $y = 3 + \dfrac{x}{200}$

For $x = 0, y = 3$

7. Correct Answer: D
Solution:
Let the number of second class tickets and first class tickets be x and y respectively.
Given,
$x + y = 18$
$3x + 10y = 110$
$\therefore x = 10, y = 8$
If the number of tickets of the two classes is interchanged, the total cost would be
$10 \times 10 + 8 \times 3 = $ Rs. 124
Hence, **option 4**.

8. Correct Answer: B
Solution:
Number of rolls initially = 40 dozens.
After selling half the rolls, the number of rolls left = 20 dozen
Now, between noon and closing time 60% of the remaining rolls were sold.
Hence, 40% of 20 dozen rolls = 8 dozen rolls were left unsold.
Hence, option B.

9. Correct Answer: A
Solution:
6 machine can produce 180 bottles per hour
Hence, 1 machine can produce 180/6 = 30 bottles per hour and 15 bottles in 30 minutes.
∴ 15 machines can produce 15 × 15 = 225 bottles per hour.
Hence, option A.

10. Correct Answer: A
Solution:
Assume that the scooter, the car and the train travel 16 km.

Let their speeds be 1 kmph, 4 kmph and 16 kmph respectively.

Thus time taken by the scooter, the car and the train is 16 hours, 4 hours and 1 hour respectively.

Ratio of time taken to the velocity of each vehicle will be

(16/1) : (4/4) : (1/16) = 16 : 1 : (1/16) = 256 : 16 : 1

Hence, option A.

11. Correct Answer: D
Solution:

Let the contributions of A, B, C and D in purchasing a restaurant be a, b, c and d respectively.

Thus $a + b + c + d = 5600000$ ... (1)

$b + c + d = 4.6a$ ... (2)

$a + c + d = 3.666b$ ... (3)

$0.4(a + b + d) = c$

$a + b + d = 2.5c$ ... (4)

Using (1) and (2) we get

$a = 5600000/5.6 = 1000000$ ... (5)

Using (1) and (3) we get $b = 5600000/4.66$

$= 1201716.73$ ... (6)

Using (1) and (4) we get

$c = 5600000/3.5 = 1600000$ ... (7)

Using (1), (5), (6) and (7), we get $d \approx 1800000$

Hence, **option 4.**

12. Correct Answer: D

13. Correct Answer: A
Solution:

Explanation:

Let the amount be. Rs x

B's share in the ratio 2:3:4 = $\frac{3}{9}$ of x= $\frac{x}{3}$

B's share in the ratio 7:2:5 = $\frac{2}{14}$ of x = $\frac{x}{7}$, therefore

$\frac{x}{3} - \frac{x}{7} = 40$

$\frac{4x}{21} = 40$

x = (40×21)/4 = Rs 210

A is the correct answer.

14. Correct Answer: A
Solution:
Let the monthly income of Kajal be 100k
It is given that she spent 55% of the monthly income on grocery, clothes and education in the ratio of 4 : 2 : 5 respectively
i.e she spent 55k on grocery, clothes and education in the ratio of 4 : 2 : 5 respectively.
Amount spent on clothes = (2x55k)/11
10k = 5540 (given)
So 100k = 55400
Monthly income = 100k = 55400
A is the correct answer.

15. Correct Answer: D
Solution:
Let the present age of Manisha be 5a
The present age of Deepali = Xa
The present age of Praneeta = 5a+9
Praneeta's age after 9 years = 5a+18=33
5a=15
a=3
The difference between Deepali's and Manisha's age is the same as the present age of Parineeta
Xa-5a=5a+9
3X-15=15+9
3X=39 ==> X=13
D is the correct answer.

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