Mixed Maths Questions for SBI PO Pre, IBPS PO Pre, IBPS Clerk Mains and SBI Clerk Mains Exams.

Word Problems Quiz 23

Direction: Study the following questions carefully and choose the right answer.

1. Tony, Monu and James completed a work together in 36 days and received a total payment of Rs. 54000. Tony took half of the total money, Monu took one third and James took remaining. In how many days, Tony and James would have finished the work if Monu was not working?

A. 72 days   B. 54 days   C. 96 days   D. 64 days   E. Can't be determined

2. A shopkeeper purchased 15 kg of variety A rice at Rs. X per kg and 10 kg of variety B rice at Rs. (X + 5) per kg. The shopkeeper sold the whole quantity of variety A rice at 10% profit and that of variety B rice at 20% profit. The total selling price of variety A rice was Rs. 30 more than that of variety B rice. Had the two varieties been mixed and sold at an overall profit of 20%, what would have been the selling price (per kg)?

A. Rs. 26.40   B. Rs. 23.20   C. Rs. 24.20   D. Rs. 25.00   E. None of these

3. The ratio between the length of Cuboid and the length of Rectangle is 3 : 2 and the ratio between the breadth of Cuboid and the breadth of Rectangle is 2 : 1. If the area of the Rectangle is 140 cm2 and the height of the cuboid is 10 cm. find the volume of the cuboid.

A. 3400 cm^3 B. 4200 cm^3 C. 2500 cm^3 D. 2100 cm^3 E. None of these

4. A box contains 4 tennis ball, 6 season and 8 dues balls. 3 balls are randomly drawn from the box. What is the probability that the balls are different?

A. $\dfrac{4}{17}$ B. $\dfrac{3}{11}$ C. $\dfrac{2}{13}$ D. $\dfrac{5}{17}$ E. None of these

5. The length of a circular track is 800 m. Virat and Amresh started from the same point on the track and ran in opposite directions. Virat took 12 minutes to cover one kilometer while Amresh took only 9 minutes to cover the same distance. They kept running for 90 minutes. How many times did they cross each other?

A. 10   B. 20   C. 21   D. 30   E. 31

6. Three persons Amar, Akbar and Anthony invested different amounts in a fixed deposit scheme for one year at the rate of 12% per annum and earned a total interest of Rs 3240 at the end of the year. If the amount invested by Akbar is Rs 5000 more than the amount invested by Amar and the invested by Anthony is Rs 2000 more than the amount invested by Akbar, what is the amount invested by Akbar ?

A. 12000   B. 10000   C. 8000   D. 5000   E. None of these

7. On reducing the entry fee by 35% in a park, the number of people coming to the park increased by 40%, then the percent increase or decrease in the income from the entry fee is –

A. 7% decrease   B. 9% increase   C. 9% decrease   D. 5% decrease   E. None of these

8. Arjun, Bhargav and Chetan started a business with investments of Rs. 1600, Rs. 2100 and Rs. 1500 respectively. After 8 months from the start of the business, Bhargav and Chetan invested additional amounts in the ratio of 3 : 5 respectively. If the ratio of the total annual profit to Chetan's share in the annual profit was 3 : 1 then what was the additional amount invested by Bhargav after 8 months?

A. Rs. 1200   B. Rs. 600   C. Rs. 900   D. Rs. 300   E. None of these

9. How many numbers are there in between 100 and 1000 such that exactly one of their digits is 3 if repetition is not allowed?

A. 100   B. 200   C. 300   D. 525   E. None of these

10. In an alloy of Copper and Silver, the ratio is kept in such a way that 20 kg of alloy has 1 kg more Copper as compared to Silver. What amount of Silver should be added in 450 kg of this alloy so that ratio of Copper and Silver becomes 1 : 2?

A. 180 kg   B. 200 kg   C. 225.125 kg   D. 240 kg   E. None of these

Correct Answers:

1	2	3	4	5	6	7	8	9	10
B	A	B	A	C	B	C	C	B	E

Explanations:

1. Tony, Monu and James completed a work together in 36 days.

In one day, together they will finish 1/36 of work.

Out of Rs. 54000, Tony took half of the total money, Monu took one third and James took remaining.

The shares of Tony, Monu and James are in ratio

$\frac{1}{2} : \frac{1}{3} : \left(1 - \frac{1}{2} - \frac{1}{3}\right)$ i.e., 3 : 2 : 1.

We know that efficiencies are in the same ratio as the share received in total amount.

Let us suppose that work done by Tony, Monu and James in one day is 3T, 2T and T, respectively.

$\Rightarrow 3T + 2T + T = \frac{1}{36}$

$\Rightarrow 6T = \frac{1}{36}$

$\Rightarrow T = \frac{1}{216}$

Work done by Tony in one day = 3T = $\frac{3}{216} = \frac{1}{72}$

Work done by James in one day = T = $\frac{1}{216}$

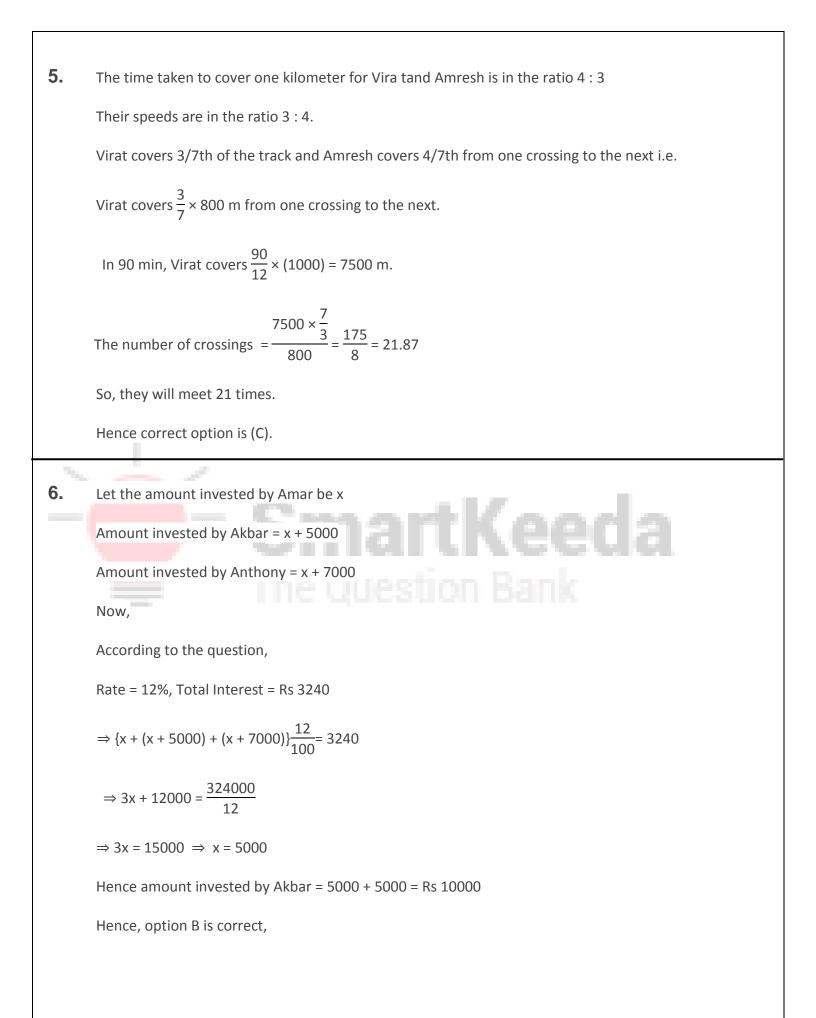Let us suppose that when Tony and James work together, they take N days to finish the work.

$\Rightarrow \frac{N}{72} + \frac{N}{216} = 1$

$\Rightarrow \frac{4N}{216} = 1 \Rightarrow N = 54$

∴ When Tony and James work together, they take 54 days to finish the work.

Hence, option B is correct.

2.

	Rice A	Rice B
Cost price	15 × x	10 × (x + 5)
	↓ 10% profit	↓ 20% profit
Selling price	110% of 15x	120% of (10x + 5)
	= 16.5x	= 12x + 60

Now, 16.5x = 12x + 60 + 30

or, 4.5x = 90

∴ x = $\dfrac{90}{4.5}$ = Rs. 20 kg

Now, new selling price of mixture

= $[15 \times 20 + 10 (20 + 5)] \dfrac{120}{100}$ = Rs. 660

∴ SP per kg = $\dfrac{660}{25}$ = Rs. 26.4 per kg

Hence, option A is correct.

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3. Length of the rectangle = 2x, length of the cuboid = 3x, Breadth of Rectangle = y, breadth of cuboid = 2y
Area of Rectangle = l × b
140 = 2x × y
xy = 70
Volume of cuboid = l × b × h
= 3x × 2y × 10 = 60 xy
= 60 × 70 = 4200 cm^3
Hence, option B is correct.

4.

Probability = $\dfrac{\text{Favorable outcomes}}{\text{Total outcomes}}$

Let us assume that all balls are unique.
There are a total of 18 balls.

Total ways = 3 balls can be chosen in $^{18}C_3$ ways = $\dfrac{18!}{3! \times 15!} = \dfrac{18 \times 17 \times 16}{3 \times 2 \times 1} = 816$

Favorable ways = 1 tennis ball, 1 season ball, and 1 dues Ball = 4 × 6 × 8 = 192

Probability $\dfrac{192}{816} = \dfrac{4}{17}$

Hence correct option is (A)

5. The time taken to cover one kilometer for Vira tand Amresh is in the ratio 4 : 3

Their speeds are in the ratio 3 : 4.

Virat covers 3/7th of the track and Amresh covers 4/7th from one crossing to the next i.e.

Virat covers $\dfrac{3}{7} \times 800$ m from one crossing to the next.

In 90 min, Virat covers $\dfrac{90}{12} \times (1000) = 7500$ m.

The number of crossings $= \dfrac{7500 \times \dfrac{7}{3}}{800} = \dfrac{175}{8} = 21.87$

So, they will meet 21 times.

Hence correct option is (C).

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6. Let the amount invested by Amar be x

Amount invested by Akbar = x + 5000

Amount invested by Anthony = x + 7000

Now,

According to the question,

Rate = 12%, Total Interest = Rs 3240

$\Rightarrow \{x + (x + 5000) + (x + 7000)\}\dfrac{12}{100} = 3240$

$\Rightarrow 3x + 12000 = \dfrac{324000}{12}$

$\Rightarrow 3x = 15000 \Rightarrow x = 5000$

Hence amount invested by Akbar = 5000 + 5000 = Rs 10000

Hence, option B is correct,

7. Let the original entry fee be 'a' and number of people initially coming to the park be 'b'.

Total income = a × b = ab

Now, reducing the entry fee by 35% in a park, the number of people coming to the park increased by 40%

∴ New entry fee = a - 35% of a = 0.65a

Number of people = b + 40% of b = 1.4 b

Total income = 0.65a × 1.4b = 0.91 ab

Decrease in income = ab − 0.91ab = 0.09ab

% decrease in income $= \dfrac{0.09\ ab}{ab} \times 100\%$

⇒ % decrease in income = 9%

Hence, option (C) is correct.

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8. Ratio of profit Arjun : Bhargav : Chetan = 1600 × 12 : 2100 × 8 + (2100 + 3x) × 4 : 1500 × 8 + (1500 + 5x) × 4

= 19200 : 16800 + 8400 + 12x : 12000 + 6000 + 20x

Now, $\dfrac{62400 + 32x}{18000 + 20x} = \dfrac{3}{1}$

or, 60x + 54000 = 32x + 62400

or, 28x = 8400

∴ x = Rs. 300

∴ B's investment after 8 months = 3 × 300 = Rs. 900

Hence, option C is correct.

9. Surely 3 can occur at either hundreds place or tens place or units place. So three cases arise.

a) If 3 occurs at hundredths place then the digit at tens place can be chosen in only nine ways (all ten digits leaving only 3 so we are left with 9 digits) and digit at units place can be chosen in only 8 ways (as 3 and digit at tens place cannot be used again)

So total such numbers = 1× 9 × 8 = 72

b) If 3 occurs at tens place then its hundreds place can be only chosen in only 8 ways (because use of 3 is not allowed and if we use 0 out of the remaining 9 digits it will be a 2-digit number which is not allowed) and unit place can be chosen only in 8 ways (since digit at hundredths place and 3 is not allowed)

So total such numbers = 8 × 1 × 8 = 64

c) If 3 occurs at units place then its hundreds place can be chosen in only 8 ways (because use of 3 is not allowed and if we use 0 out of the remaining 9 digits it will be a 2-digit number which is not allowed) and tens place can be chosen only in 8 ways (since digit at hundredths place and 3 is not allowed)

So total such numbers = 8 × 8 × 1 = 64

Hence total such numbers = 72 + 64 + 64 = 200

Hence, option B is correct.

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10. 20 kg of alloy has 1 kg more Copper as compared to Silver.
Let amount of Copper be T kg. Then amount of Silver will be (T − 1) kg.
T + T − 1 = 20 ⇒ T = 10.5 kg
Amount of silver in 20 kg alloy = T − 1 = 9.5 kg

Amount of silver in 450 kg alloy = $\frac{9.5}{20}$ × 450 kg = 213.75 kg

Amount of copper in 450 kg alloy = $\frac{10.5}{20}$ × 450 kg = 236.25 kg

Suppose M kg of silver is added in 450 kg of this alloy so that ratio of Copper and Silver becomes 1 : 2.

⇒ $\frac{236.25}{(213.75 + M)} = \frac{1}{2}$

⇒ 472.5 = 213.75 + M

⇒ M = 258.75
∴ 258.75 kg of Silver should be added.
Hence, option E is correct.