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Mixed Quant for SSC Exams.

SSC Maths Quiz 14

Directions: Read the following questions carefully and choose the right answer.

- In a family of husband, wife and a daughter, the sum of the husband's age, twice the wife's age, and thrice the daughter's age is 85; while the sum of twice the husband's age, four times the wife's age, and six times the daughter's age is 170. It is also given that the sum of five times the husband's age, ten times the wife's age and fifteen times the daughter's age equals 450. The number of possible solutions, in terms of the ages of the husband, wife and the daughter, to this problem is

A. 3 B. 2 C. 0 D. Infinite solutions
- A pendulum at the first floor of an office ticks 90 times in 95 seconds while another pendulum at the second-floor ticks 315 times in 323 seconds. If both the pendulum were started together, how many times will they tick together in the first hour?

A. 100 B. 200 C. 300 D. 400
- A man completed certain journey by a car. If he covered 30% of the distance at a speed of 30 km/hr, 60% distance at 20 km/hr and the remaining distance at 5 km/hr then what was his average speed during the entire journey?

A. 20.25 kmph B. 17.67 kmph C. 18.5 kmph D. 16.67 kmph
- An alloy contains zinc, copper and tin the ratio 2 : 3 : 1 and another contains copper, tin and lead in the ratio 5 : 4 : 3. If equal weights of both alloys are melted together to form a third alloy, then the weight of lead per kg in the new alloy will be

A. $\frac{1}{2}$ kg B. $\frac{1}{8}$ kg C. $\frac{3}{14}$ kg D. $\frac{7}{9}$ kg
- Mr. Sharma invested an amount of Rs. 25000 in a fixed deposit at compound interest 8% per annum for two years. What amount Mr. Sharma will get on maturity?

A. Rs. 28540 B. Rs. 29160 C. Rs. 29240 D. Rs. 28240
- P and Q enter into a partnership. P contributes Rs. 8500 while Q contributes Rs. 6600. After 3 months Q withdraws $\frac{1}{3}$ part of his contribution and after 4 months from the starting P puts Rs. 2500 more. When P invested more money, R also joins them with Rs. 7200. If at the end of 1 year there is a profit of Rs. 6000, what will be the approximate share of R in the profit?

A. Rs.1398

B. Rs. 1404

C. Rs. 1428

D. Rs. 1446

7. A family has 4 earning members P, Q, R, S. In 2011 their respective shares in the total income was 25%, 35%, 10%, 30% respectively. They spend 40% of the total income and save the remaining. In 2012 P's salary went up by 20%, Q's salary increased by 20% and R's salary decreased by 10% and S's salary decreased by 20%. In 2012 what percent total family income should they spend to save same amount as in 2011?

A. 25.3%

B. 34.6%

C. 41.5%

D. 42.8%

8. Arpita can row in still water at 4 km/hr in a stream flowing at the speed of 2 km/hr. If she rows the same distance up and down the stream then find her average speed?

A. 1 km/hr

B. 3 km/hr

C. 5 km/hr

D. 7 km/hr

9. The length of the portion of the straight line $5x + 12y = 120$ intercepted between the axis is

A. 26

B. 30

C. 36

D. 40

10. When the sun is 30° above the horizontal, the length of shadow cast by a building 50 m high is:

A. $41\sqrt{6}$

B. $50\sqrt{3}$

C. $55\sqrt{3}$

D. $60\sqrt{3}$

Correct Answers:

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



Explanations :

1. Let the age of husband wife and daughter be denoted by h, w and d respectively

$$\Rightarrow h + 2w + 3d = 85 \text{ ----- (i)}$$

$$\Rightarrow 2h + 4w + 6d = 170 \text{ ----- (ii)}$$

$$\Rightarrow 5h + 10w + 15d = 450 \text{ ----- (iii)}$$

Multiplying the first equation by 5 we get

$$\Rightarrow 5h + 10w + 15d = 425$$

But Eq (iii) gives $5h + 10w + 15d = 450$

So, No solutions possible

\therefore No solution is possible.

Hence, Option C is correct.

2. The first pendulum ticks every $95/90$ seconds and the second pendulum ticks at every $315/323$ seconds.

They will ticks together after LCM of $\frac{95}{30}$ and $\frac{323}{315}$ seconds

Therefore LCM $\left(\frac{95}{90} \text{ and } \frac{323}{315}\right)$

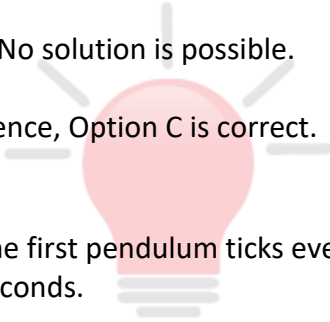
$$= \frac{\text{LCM}(95,323)}{\text{HCF}(90,315)}$$

$$= \frac{(19 \times 5 \times 17)}{45}$$

The numbers of times both the pendulums will tick together in an hour

$$= \frac{(3600 \times 45)}{(19 \times 5 \times 17)} \approx 100$$

Hence, Option A is correct.



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3. Let the total distance = 100a km

Time take to cover 30% of distance at 30 kmph

$$= \frac{30a}{30} = a \text{ hour}$$

Time taken to cover 60% of distance at 20 km/hr

$$= \frac{60a}{30} = 2a \text{ hour}$$

Time taken to cover 10% of distance at 5 km/hr

$$= \frac{10a}{5} = 2a \text{ hour}$$

Hence average speed

$$= \frac{100a}{a + 3a + 2a} = 16.67 \text{ kmph}$$

Hence, Option D is correct.

4. First alloy ratio = 2 : 3 : 1

Second alloy ratio = 5 : 4 : 3

Let the weight of zinc, copper and tin be 2x, 3x and x in 1st alloy of 6x.

the weights of copper, tin and lead be 5x, 4x, and 3x in 2nd alloy of 12x.

Equal weights of both alloys are melted together.

Now weights are zinc, copper, tin and lead

$$= \frac{2}{6} : \frac{3}{6} + \frac{5}{12} : \frac{1}{6} + \frac{4}{12} : \frac{3}{12}$$

$$= \frac{1}{3} : \frac{11}{12} : \frac{1}{2} : \frac{1}{4}$$

$$= 4 : 11 : 6 : 3$$

∴ The weight of lead per kg

$$= \frac{3}{(4 + 11 + 6 + 3)} = \frac{1}{8}$$

Hence, Option B is correct.

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5. Amount received when interest is compounded

$$= \left[1 + \left\{ \frac{r}{n \times 100} \right\}^{n \times t} \right]$$

Where, P is the principal amount

r is the rate of interest per annum

n is the number of compoundings in an year

t is the time period in years

Here, p = 25000, r = 8, n = 1 and t = 2 years

$$\Rightarrow \text{Amount} = 25000 \left(1 + \frac{8}{100} \right)$$

$$\Rightarrow \text{Amount} = 25000 \times \frac{27}{25} \times \frac{27}{25}$$

$$\text{Amount} = 29160$$

Amount which Mr. Sharma will get on maturity is Rs. 29160

Hence, Option B is correct.

6. Contribution of P = $8500 \times 12 + 2500 \times 8 = \text{Rs. } 122000$

Contribution of Q

$$= 6600 \times 3 + \left(1 - \frac{1}{3} \right) \times 6600 \times 9$$

$$= \text{Rs. } 59400$$

Contribution of R = $7200 \times 8 = \text{Rs. } 57600$

Ratio of contribution of P, Q and R = $122000 : 59400 : 57600 = 610 : 297 : 288$

Sum of ratios = $610 + 297 + 288 = 1195$

\therefore Approximate share of R in the profit

$$= \frac{288 \times 6000}{1195} = \text{Rs } 1446$$

Hence, option D is correct.

7. Let the total salary of the family be 100
 In 2011 the family saved = $100 - 40 = 60$
 Total income in 2012 = $(25 \times 1.2) + (35 \times 1.2) + (10 \times 0.9) + (30 \times 0.8) = 105$
 In order to save 60, they have to spend = $105 - 60 = 45$
 Req. % = $\frac{45}{105} \times 100 = \frac{200}{7} = 42.8\%$

Hence, Option D is correct.

8. When the distance travelled is unknown and the speed of stream and speed of swimmer is given, use the following formula to compute the average speed.

$$\text{Average speed} = \frac{(x^2 - y^2)}{x}$$

Speed of Arpita = $x = 4$ km/hr

Speed of stream = $y = 2$ km/hr

$$\text{Average speed} = \frac{x^2 - y^2}{x} = \frac{(4^2 - 2^2)}{4} = \frac{(16 - 4)}{4} = 3 \text{ km/hr}$$

Hence, Option B is correct.

9. Let the point of intersection at x-axis = $(x, 0)$

$$5x + 12y = 120$$

$$5x + 12 \times 0 = 120$$

$$5x = 120$$

$$x = 24$$

Point of intersection = $(24, 0)$

Let the point of intersection at y-axis = $(0, y)$

$$5x + 12y = 120$$

$$5 \times 0 + 12y = 120$$

$$12y = 120$$

$$y = 10$$

Point of intersection = $(0, 10)$

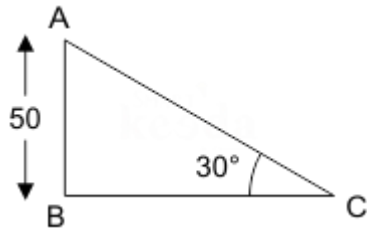
$$\text{Required length} = MN = [(24 - 0)^2 + (0 - 10)^2] = (576 + 100) = 26 \text{ units}$$

Hence, Option A is correct.

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10.



$$\text{Therefore } \tan 30^\circ = \frac{50}{BC}$$

$$BC = 50\sqrt{3}$$

Hence, Option B is correct.



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