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Mixed Maths Questions for LIC AAO Pre Exam

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

1. The speed of current is 5 km/h. What will be the respective downstream speed and upstream speed of a boy rowing a boat, if one third of the distance covered going downstream in a certain time is equal to the distance covered going upstream in the same time.

A. 15 kmph, 5 kmph   B. 20 kmph, 10kmph   C. 18 kmph, 8 kmph

D. 24 kmph, 14 kmph   E. None of these

2. 2 employees and 3 trainees together can finish a project in 7 days, 6 employees and 13 trainees together can finish the same project in 2 days. Find the time taken by 4 employees and 4 trainees together to finish the same work.

A. 4 days   B. 5 days   C. 6 days

D. 8 days   E. None of these

3. In how many ways can the walls of a cuboidal box be painted using six different colours using one colour for each wall if six different symbols are carved on the box with one on each wall?

A. 240   B. 560   C. 720

D. 360   E. 180

4. Instead of normal weighing scale a shopkeeper used forged scale. He used 1.4 kg scale while buying and 840g scale while selling, what will his overall profit percentage, if in the end he offers 10% discount?

A. 50%   B. 48%   C. 40%

D. 38%   E. None of these

5. A certain amount of money is lent out at compound interest at the rate of 20% per annum for two years, compounded annually. It would give Rs. 482 more if the amount is compounded half yearly. Find the principle.

A. Rs. 30000   B. Rs. 10000   C. Rs. 15000

D. Rs. 25000   E. Rs. 20000

6. The income tax department has changed the method of calculating the tax amount from a flat tax of 10% on the taxable income to a fixed charge of Rs. 20,000 plus 5% tax on the taxable income exceeding Rs. 2,00,000. If an individual's tax amount as per the new calculation is Rs.5,000 less than that found by using the old formula, what is his taxable income?

A. Rs. 2,88,000   B. Rs. 2,92,000   C. Rs. 3,00,000

D. Rs. 2,78,000   E. Rs. 3,25,000

7. A military truck covers a distance of 9072 km travelling continuously for 5 days 6 hrs. If it covers 4320 km in half the time, by how much does the speed of the military truck for the remaining part of the journey differ from that for the entire journey?

A. 3.2 kmph more   B. 3.2 kmph less   C. 3.43 kmph more

D. 3.43 kmph less   E. 4 kmph less

8. In a private company 36% of the total employees are engineers and 66.67 % of total engineers are women. If 40% of the total employees are women, then per cent of men who are not engineers?

A. 50 %   B. 60 %   C. 70 %

D. 80 %   E. None of these

9. If the length of a rectangle is increased by 25% and the breadth is reduced by 33.33% then what will be the effect on its diagonal(approximately)?

A. 7.6%   B. 8.33%   C. 6%

D. 7.33%   E. No change

10. There are 200 balls (numbered 1 to 200) in a box. Find the probability of choosing a ball which bears either perfect cube or perfect square and the unit digit is either multiple of 3 or multiple of 2?

A. 11/200   B. 3/50   C. 17/200

D. 13/200   E. None of these

Correct answers:

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

Explanations:

1.

Let the speed of boy in still water be X km/h

And the speed of current is given = 5 km/h

Downstream speed = (X + 5) km/h

Upstream speed = (X – 5) km/h

Let time be 't' hours.

$$\Rightarrow \frac{(X + 5)\ t}{3} = (X - 5)\ t$$

⇒ X + 5 = 3X – 15

⇒ 2X = 20

⇒ X = 10 km/h

Downstream speed = 10 + 5 = 15 km/h

Upstream speed = 10 – 5 = 5 km/h

Hence, option A is correct.

2.

Let time taken by 4 employees and 4 trainees together is 'x'.

Let one day work of one employee and one trainee is 'E' and 'T' respectively.

Total work = 7 × (2E + 3T) = 2 × (6E + 13T)

⇒ 14E + 21T = 12E + 26T

⇒ 2E = 5T **........ (1)**

Total work done by 4 employees and 4 trainees together in 'x' days = x × (4E + 4T) = 2 × (6E + 13T)

From equation (1)-

⇒ x × (10T + 4T) = 2 × (15T + 13T)

⇒ x = $\dfrac{56T}{14T}$ = 4 days

Hence, option A is correct.

3.

No. of ways in which the walls of the box can be painted using six different colours = 6! = 720.

Hence, option C is correct.

4.

Let's say the price of 1000g of goods = Rs.1000

Now he gets 1400g of goods at Rs.1000

Hence CP of shopkeeper for 1 g

$$= \frac{1000}{1400} = Rs.\frac{5}{7}$$

CP of shopkeeper for 840g

$$= \frac{5}{7} \times 840 = Rs.600$$

Now instead of selling 1000g he sells 840g for Rs.900 (10% discount)

$$\text{Profit} = \frac{900 - 600}{600} \times 100 = 50\%$$

Hence, option A is correct.

5.

When compounded annually, the amount received at the end of the period is A

$$= P \left(1 + \frac{r}{100}\right)^{n}$$

When compounded half yearly, the amount received at the end of the period is A

$$= P \left(1 + \frac{r/2}{100}\right)^{2n}$$

Let the principle be P.

Interest on this amount when compounded annually at the rate of 20% per annum $= P [(1.20)^2 - 1]$

Interest on this amount when compounded half yearly $= P [(1.10)^4 - 1]$

The difference between the two is Rs. 482

∴ P [(1.10)^4 − 1] − P [(1.20)^2 −1] = 482

∴ P [1.4641 − 1.44] = 482

∴ P = Rs. 20,000

Hence, option E is correct.

6.

Let the taxable income be Rs. x.

Tax amount (in Rs.) as per old calculation = 0.1x

Tax amount (in Rs.) as per new calculation = 20000 + 0.05 (x − 200000) = 0.05x + 20000 − 10000 = 0.05x + 10000

The tax amount as per the new calculation is Rs. 5,000 less than that found by the old calculation.

∴ 0.05x + 10000 = 0.1x − 5000

∴ 0.05x = 15000

∴ x = 300000

Hence, option C is correct.

7.

Average speed = $\dfrac{\text{Total Distance travelled}}{\text{Total time taken}}$

Total time = 5 day + 6 hours = 126 hours

Average speed = $\dfrac{9072}{126}$ = 72 km/hr

Remaining part of journey = 9072 − 4320 = 4752 km

Remaining time = $\dfrac{126}{2}$ = 63 hours

Speed of remaining part of journey

= $\dfrac{4752}{63}$ = 75.43 km/hr

∴ The speed of the military truck for the remaining part of the journey differ from that for the entire journey = 75.43 – 72 = 3.43 km/hr

Hence, option C is correct.

8.

Let total employee = 1000x

Women = 400x

Men = 600x

Total engineers = 36% of 1000x = 360x

Female engineers = 360x × $\dfrac{200}{3 \times 100}$ = 240x

Male engineers = 360x – 240x = 120x

Men who are not engineers = 600x – 120x = 480x

Reqd. % = $\dfrac{480x}{600x}$ × 100 = 80%

Hence, option D is correct.

9.

Let the length of the rectangle = 4 units

And breadth of the rectangle = 3 units

Then diagonal of the rectangle = $\sqrt{(4^2 + 3^2)}$ = 5 units

According to the question, the length of a rectangle is increased by 25% and the breadth is reduced by 33.33%

New length = 125% of 4 units = 5 units

New breadth = 66.66% of 3 units = 2 units

In the new rectangle, New diagonal= $\sqrt{(5^2 + 2^2)}$ = $\sqrt{29}$ = approximately 5.38 units

Change = $(5.38 - 5) \times \dfrac{100}{5}$ = 7.6%
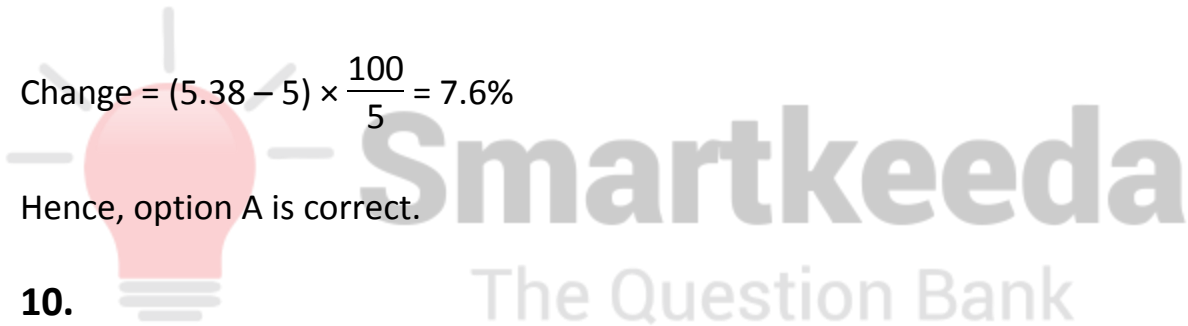
Hence, option A is correct.

10.

The balls which bears either perfect cube or perfect square = 1, 4, 8, 9, 16, 25, 27, 36, 49, 64, 81, 100, 121, 125, 144, 169, 196

The total number of balls in which the unit digit is either multiple of 3 or multiple of 2 = 4, 8, 9, 16, 36, 49, 64, 100, 144, 169, 196 = 11

So the required probability = $\dfrac{11}{200}$

Hence, option A is correct.