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# Mixed Maths Questions for LIC AAO Exam.

## LIC AAO Maths Quiz 18

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

1. The average of 12 numbers is 14. If four numbers 7, 8, 13, and 14 are replaced by 3 numbers having average of 12. What is the difference between the averages of initial numbers and final numbers?

- A. 0.52                      B. 0.34                      C. 0.85                      D. 0.72                      E. None of these

2. In the village of Rampur, the percentage of female population in the total population is 55%. The number of people who possess sheep as cattle is 44. Out of the sheep owners,  $\frac{3}{4}$ th are female. If out of the total female population, only 25% women own sheep. What is the total population of Rampur?

- A. 250                      B. 280                      C. 300                      D. 240                      E. None of these

3. Mukund buys 5 watches at the rate of Rs. 5000 each. He then sells them separately at the profit of 10%, 20%, 30%, 40% and 50%. He then buys an expensive watch investing the profit he earned by selling watches, marks it up 50% and offer discounts of 20%. What is the total profit earned by Mukund?

- A. Rs. 7000                      B. Rs. 7500                      C. Rs. 8000                      D. Rs. 9000                      E. None of these

4. A sum of Rs. 9960 was borrowed at  $15\frac{1}{2}\%$  per annum compound interest and paid back in two years in two equal annual installments. What was the amount of each installment?

- A. Rs. 5345                      B. Rs. 5547                      C. Rs. 5847                      D. Rs. 5397                      E. None of these

5. A card is drawn from a perfectly shuffled deck of cards. What is the probability that the card drawn is a spade and is an even numbered card?

- A.  $\frac{16}{52}$                       B.  $\frac{4}{13}$                       C. Both A and B                      D.  $\frac{1}{13}$                       E. None of these

6. A boat takes thrice as much time to go upstream than going downstream if distance is same. If a leaf floating on the river covers a distance of 1 km in 12 minutes, what is the time taken by the boat to travel 45 kms upstream and come back?

- A. 8 hours                      B. 10 hours                      C. 12 hours                      D. 15 hours                      E. None of these

7. Vikas is a contractor and he has undertaken a project where he has to build a wall that takes 10 days to build if 20 persons are working on it. But he has an enemy named Shekhar, who keeps on destroying the wall at night. Shekhar has employed 5 persons to destroy the wall. If Vikas succeeds in completing the construction in 20 days. How many days would it take for a person to destroy  $\frac{3}{4}$ <sup>th</sup> of the wall?

- A. 75 days                      B. 50 days                      C. 40 days                      D. 25 days                      E. None of these

8. In a circular field, Pawan and Ketan decide to run. They start from point A. Pawan runs along the boundary and Ketan runs across the field to a diametrically opposite point B. Just When Pawan reaches B, Ketan has already reached point A after touching point B. If the speed of Ketan is 70 m/s, what is the speed of Pawan?

- A. 35 m/s                      B. 40 m/s                      C. 55 m/s                      D. 110 m/s                      E. Can't be determined

9. A square of maximum area is shaded inside a circle of radius 14 cm. What is the area of the unshaded region?

- A.  $224 \text{ cm}^2$                       B.  $324 \text{ cm}^2$                       C.  $256 \text{ cm}^2$                       D.  $316 \text{ cm}^2$                       E. None of these

10. In the recent farewell function of MPS college, 8 dancers have participated and 'n' group-dances were performed. Each group-dance is performed by 4 dancers and each pair of dancers performed together in the same number of group-dances. What is the minimum possible value of n?

- A. 12                      B. 32                      C. 14                      D. 24                      E. None of these

**Correct Answers:**

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>
D	D	D	B	E	C	A	C	A	C

## Explanations:

- 1.** Since the avg of 12 numbers is 14, the total becomes  $12 \times 14 = 168$   
From this total, 4 numbers are subtracted:  $168 - (7 + 8 + 13 + 14) = 126$   
In this number, three numbers of average 12 is added  
 $126 + (3 \times 12) = 162$   
This number is divided by 11 because now there are 11 numbers instead of 12  
 $162 / 11 = 14.72$   
The difference between the initial and final avg is  $14.72 - 14 = 0.72$   
Hence, option D is correct.

- 2.** In this type of question, attention should be given to the language of the question.  
Since total number of sheep are 44 and of those  $\frac{3}{4}$ th are female, it means 33 women own sheep.  
It is given that of all the women, only 25% (or one fourth) own sheep. It means, total number of women are:  
 $33 \times 4 = 132$   
It is also given that the percentage of female population is 55% of the total population in the village.  
So,, by the rule of proportion  
 $55\% \equiv 132$   
 $100\% \equiv ?$   
Therefore,  $? = 240$   
Option D is hence the correct answer.

- 3.** The average profit on the watches is 30% (because the given profit% are in AP and there the middle term has to be the average.)  
So the profit made on one watch is 30% of 5000 = 1500  
Total profit =  $1500 \times 5 = 7500$   
This is the cost price of the expensive watch which is sold at  
 $\Rightarrow 80\%$  (after discount)  $\times 150\%$  (after including profit) of 7500  
 $\Rightarrow 9000$   
Since the only cost incurred was the cost for 5 watches and after that only the profit has been reinvested. So the total profit earned is Rs. 9000.  
Option D is hence the correct answer.

4. Let the each instalment be x.

$$\frac{x}{\left(1 + \frac{15}{2 \times 100}\right)} + \frac{x}{\left(1 + \frac{15}{2 \times 100}\right)^2} = 9960$$

$$\frac{x}{\left(1 + \frac{3}{40}\right)} + \frac{x}{\left(1 + \frac{3}{40}\right)^2} = 9960$$

$$\Rightarrow \frac{40x}{43} + \frac{1600x}{1849} = 9960$$

$$\Rightarrow \frac{1720x + 1600x}{1849} = 9960$$

$$\Rightarrow 3320x = 9960 \times 1849 \Rightarrow x = \text{Rs. } 5547$$

Hence, option B is correct.

5. There are 52 cards in a deck and there are four suits of cards - Spade, Club, Heart and Diamond.

$$\text{So, probability of getting a card of Spade} = \frac{13}{52} = \frac{1}{4}$$

Each of these cards contain an ace, 3 face cards and 9 numbered cards. The numbers are 2, 3, 4, 5, 6, 7, 8, 9 and 10.

So, there are total 13 cards of spade and of that only 5 are even numbered ones. Therefore, we can say that total number of cards that are spade and are even numbered are 5.

$$\text{Probability of the card being even numbered out of all cards of Spade} = \frac{5}{13}$$

$$\text{Therefore, probability of a card being one from Spade and an even numbered one} = \frac{1}{4} \times \frac{5}{13} = \frac{5}{52}$$

Hence, option E is correct.

6. Since the leaf doesn't have a speed of its own, so it travels because of the speed of current.

Now leaf travels 1 km in 12 minutes, so it will travel 5 km in 1 hour which means speed of current is 5 km/h.

Let the speed of boat be  $x$  km/h

So speed upstream is  $(x - 5)$  km/h and speed downstream =  $(x + 5)$  km/h

According to the question, time taken upstream is 3 times that of downstream, which means speed downstream is 3 times that of Speed upstream because distance is constant here.

Therefore we can write  $(x + 5) = 3(x - 5)$

Solving it, we get  $x = 10$ .

So speed downstream = 15 km/h and upstream is 5 km/h

Now time taken to travel 45 km upstream =  $\frac{45}{5} = 9$  hours

and time taken to travel 45 km downstream =  $\frac{45}{15} = 3$  hours

Therefore, total time taken =  $9 + 3 = 12$  hours

Hence, option C is correct.

7. Let's assume the work done in construction in terms of percentage.

The completion of the construction of the wall is 100%

Therefore,  $10 D \times 20 W = 100\%$

$\Rightarrow 1 WD = 1/2\%$  (It means 1 worker can build 1/2% of the wall in 1 day)

Now, let's consider the destruction of the wall. Without destruction, the work done in 20 days would have been 200% but only 100% is done.

That means the destruction caused in 20 days is also 100%.

$20 d \times 5 w = 100\%$

$\Rightarrow 1 wd = 1\%$

So 3/4th (or 75%) of the wall can be destructed by 1 worker in = 75 days

Option A is hence the correct answer.

8. Pawan covers a distance of half the circumference =  $\pi r$

Ketan covers a distance of 2 diameters =  $2 \times 2r = 4r$

Since time taken is same, ratio of speeds will be same as the ratio of distance covered.

Let Speed of Pawan be  $x$ .

$$\frac{\text{Speed of Pawan}}{\text{Speed of Ketan}} = \frac{\text{Distance covered by Pawan}}{\text{Distance covered by Ketan}}$$

$$\frac{x}{70} = \frac{\pi r}{4r}$$

$$\Rightarrow x = 55 \text{ m/s}$$

Option C is hence the correct answer.

9.

The area of the circle is  $\frac{22}{7} \times 14 \times 14 = 616 \text{ cm}^2$

The square of the largest area is shaded.

If we think about it, the diagonals of that square will be equal to the diameter of the circle.

Therefore, area of the square =  $\frac{1}{2} \times (\text{diagonal})^2$

$$\Rightarrow \frac{1}{2} \times 28 \times 28 = 392 \text{ cm}^2$$

Therefore, the area of the unshaded region =  $616 - 392 = 224 \text{ cm}^2$

Option A is hence the correct answer.

10. Let  $p$  be the number of dance shows that each pair of dancers performed together.

Since we have 8 dancers, we can choose 2 dancers from these 8 dancers in  $({}^8C_2)$  ways.

Number of dance shows that will be performed =  $p \times {}^8C_2$

But this counts dances performed by four people together, multiple times.

Number of ways in which two pairs of dancers will be chosen for a dance out of 4 pairs =  ${}^4C_2$

Since there are  $p$  dance shows, number of unique group dances is

$$\therefore n = \frac{p \times ({}^8C_2)}{({}^4C_2)} = \frac{14p}{3}$$

$\therefore$  The minimum value of  $n$  is 14 (which is attained at  $p = 3$ )

Hence, option C is correct.



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