Mixed Maths Questions for LIC AAO Exam.

LIC AAO Maths Quiz 19

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

1. Rs. 160000 is divided into two equal parts. One part is invested in a scheme which gives 12% interest compounded annually for two years. The other part is invested in a scheme offering simple interest of 13% for 2 years. What is the difference between the interest earned on the two schemes?

A. Rs. 512 B. Rs. 426 C. Rs. 448 D. Rs. 568 E. None of these

2. A and B start a business in which B contributed to 40% of the capital and the rest by A. After few months A withdrew half of his amount and B withdrew quarter of what he had invested. After how many months did they make the withdrawal if after 1 year A and B shared the profit in the ratio 102/82 respectively?

A. 3 months B. 4 months C. 5 months D. 6 months E. None of these

3. Ratio of present age of X & Y is 4 : 3. At the time X & Y got married this ratio was 5 : 3. After 4 years this ratio became 9 : 7. How many years ago did X & Y got married?

A. 8 B. 12 C. 11 D. 16 E. None of these

4. Inside a rectangular ground of dimensions 40m × 50m, a circular area of radius 14m is demarcated to install a ride. The remaining area is to be covered in tiles. If the cost of laying tiles is rupees 50 square meter, what is the total cost of laying tiles?

A. Rs. 56460 B. Rs. 64320 C. Rs. 56800 D. Rs. 69200 E. None of these

5. The average weight of 60% students of a class is 50% more than the remaining students. There are 25 students in the class. What is the total weight of the class if the average weight of the 60% students is 60 kg?

A. 1200 kg B. 1300 kg C. 1400 kg D. 1500 kg E. None of these

6. A and B started a business with Rs. 20000, 40% of which is contributed by the former and the rest by the latter. After 4 months, A increased his investment by 25%. After 2 more months, B increased his investment by half of his initial investment. 2 months after that, A increased his investment to 3/2 of the previously invested amount. If the amount of profit earned at the end of the year is Rs. 78000, what is the share of A in the profit?

A. Rs. 32000 B. Rs. 36000 C. Rs. 27000 D. Rs. 30000 E. None of these

7. Train A has a speed of 50 kmph and starts from Delhi towards Dehradun.Train B has a speed of 60 kmph and travels from Dehradun towards Delhi. Distance between Delhi and Dehradun is 600 km. If Train B starts 1 hour after Train A, what is distance between Dehradun and the meeting point of both the trains?

A. 200 km B. 250 km C. 350 km D. 300 km E. None of these

8. If 3 letters are chosen randomnly out of the 26 alphabets one at a time after replacing the previous one. What is the probability that the the letter appearing in the first attempt is a vowel, the letter appearing at the second attempt a consonant and the letter appearing in the third attempt appears in the word "ALLAHABAD"?

A. $\frac{842}{17576}$ B. $\frac{525}{17576}$ C. $\frac{675}{17576}$ D. $\frac{815}{17576}$ E. None of these

9. 7 spherical balls are made by melting a cylinder of radius 7cm and height 65.33 cm. The spherical balls are of same size. What is the surface area of a single spherical ball?

A. 544 cm^2 B. 616 cm^2 C. 680.33 cm^2 D. 720 cm^2 E. None of these

10. If the compound interest on certain sum at 4% for 2 years is Rs. 2448. Find the simple interest on the same sum at the same rate for the same period.

A. 2500 B. 2400 C. 2436 D. 2420 E. None of these

Correct Answers:

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

Explanations:

1. **Method I:**

The amount of 160000 is divided into two equal parts – 80000

Interest earned in the first scheme = 80000 × (112/100) × (112/100) = 100352 – 80000 = 20352

Interest earned in the second scheme = 80000 × 13 × 2/100 = 20800

Difference = 20800 – 20352 = Rs. 448

Method II:

The amount of 160000 is divided into two equal parts - 80000

When Rs. 80000 is compounded annually for 2 years at the rate of 12% interest. the effective rate of interest for two years becomes 25.44% (Kindly refer to Sub-details).

And that man invests half the part in another scheme offering 13% per annum at simple interest for 2 years, the interest become 26%.

Rate per cent difference = 26% – 25.44 = 0.56%

Required difference = 0.56% of 80000 = 448

Sub details:

We can calculate the effective rate of interest by applying the net% effect formula

$= x + y + \frac{xy}{100}\%$

Here, x = 12% and y = 12%

So, the effective rate of interest for two years will be as follows:

$= 12 + 12 + \frac{12 \times 12}{100} = 25.44\%$

Hence, option C is correct.

2. Let the total capital in the business be 100x

Contribution of A = 60x and contribution of B = 40x

Let the time before withdrawal be x months

So time money product before withdrawal= A = 60xy and B = 40xy

After withdrawal Capital of A= 30x and B= 30x

So time money product after withdrawal = A= 30x(12 – y) and B = 30x(12 – y)

Total time money product of A = 60xy + 30x(12 – y)

Total time money product of B = 40xy + 30x(12 – y)

Now their ratio is 102 : 82

So we will equate them in the way

$$\frac{60xy + 30x(12 - y)}{40xy + 30x(12 - y)} = \frac{102}{82}$$

y will come out to be 5 months

Hence, option C is correct.

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3. Let the present age of X be 4m and the present age of Y be 3m

Also, let us assume that they got married t years ago.

So, as per the question

$$\frac{(4m - t)}{(3m - t)} = \frac{5}{3} \quad \textbf{....(1)}$$

$$\frac{(4m + 4)}{(3m + 4)} = \frac{9}{7}. \quad \textbf{...(2)}$$

Equation (2) is solvable as (1) has 2 variables. Thus, solving (2)

$7 \times (4m + 4) = 9 \times (3m+4)$

$28m + 28 = 27m + 36$

$m = 8$

Now using the value of m in (1) we get

$$\frac{(32 - t)}{(24 - t)} = \frac{5}{3}$$

t = 12 years

Hence, option B is correct.

4. The area of the ground is $40 \times 50 = 2000 m^2$

The area of the circular area is $\frac{22}{7} \times 14 \times 14 = 616\ m^2$

The remaining area = $2000 - 616 = 1384\ m^2$

The cost of laying tiles = 1384×50 = Rs. 69200

Hence, option D is correct.

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5. Since there are 25 students in a class. 60% have an average of 60kg

Which means that 15 students have an average weight of 60kg

The other 10 students have weight of 33.33% less than that of the 60% students (Product Constancy)

So, it means their weight is 40kg

Total weight is $(15 \times 60) + (10 \times 40) = 1300$ kg

Hence, option B is correct.

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6. The initial investment of A and B is 8000 and 12000 respectively

The time money product of A is calculated below:

For first 4 months: $8000 \times 4 = 32000$

For next 4 months: $10000 \times 4 = 40000$

For the last 4 months: $15000 \times 4 = 60000$

Total time money product is (32000 + 40000 + 60000) = Rs. 132000 The time money product of B is calculated below:

For first 6 months: $12000 \times 6 = 72000$

For the last 6 months: $18000 \times 6 = 108000$

Total time money product is (108000 + 72000) = Rs. 180000 The total profit is Rs. 78000

The share of A in this profit is

$$\frac{78000 \times 108000}{(180000 + 132000)} = 27000$$

Hence, option C is correct.

7. Since Train A starts 1 hour before Train B, it has already covered 1 × 50 = 50 km.

Now the distance between Train A and Train B is 550 km.

The ratio of distance before meeting point is directly proportional to the speed of the objects

Since the ratio of their speeds is $\frac{50}{60}$ = 5:6,

the ratio of distance will be 5:6 as well

A will travel $\frac{550 \times 5}{11}$ = 250 km

B will travel the rest 300 km

Total distance travelled by A is 300 km and same is that travelled by B. So meeting point is exactly in the middle that is

$\frac{600}{2}$ = 300 km from Dehradun

Hence, option D is correct.

8. The probability of the three events are given below

1st attempt -

Since there are 5 vowels so the probability is $\frac{5}{26}$

2nd attempt-

Since there are 21 consonants so the probability is $\frac{21}{26}$

3rd attempt-

5 letters appear in the word ALLAHABAD - A,L,H,B,D so the probability is $\frac{5}{26}$

Therefore the probability of all three happening together is

$\frac{5}{26} \times \frac{21}{26} \times \frac{5}{26} = \frac{525}{17576}$

Hence, option B is correct.

9.

The volume of the cylinder will be $\frac{22}{7} \times 7 \times 7 \times 65.33$

The volume of the spheres will be $\frac{4}{3} \times \frac{22}{7} \times r^3$

but since there are 7 spheres, the total volume of spheres becomes 7

$7 \times \frac{4}{3} \times \frac{22}{7} \times r^3$

Since the volume remains same. We will equate both the terms

$\frac{22}{7} \times 7 \times 7 \times 65.33 = 7 \times \frac{4}{3} \times \frac{22}{7} \times r^3$

$r^3 = 342.98 \approx 7^3$ cm

r = 7 cm

The surface area will be $4 \times \frac{22}{7} \times 7 \times 7$

$= 616 \text{ cm}^2$

Hence, option B is correct.

10. **Method I:**

Let the sum be Rs. x, then,

$\text{C.I} = \left[x \times \left(1 + \frac{4}{100}\right)^2 - x\right] = \left(\frac{676x}{625} - x\right) = \frac{51x}{625}.$

So, $\frac{51x}{625} = 2448$ or $x = \frac{2448 \times 625}{51} = 30000.$

Thus, the sum is Rs. 30000.

So, $\text{S.I} = \text{Rs}\left(30000 \times 4 \times 2 \times \frac{1}{100}\right) = \text{Rs } 2400.$

Hence, option B is correct.