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Mixed Maths Questions for LIC AAO Exam.

LIC AAO Maths Quiz 7

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

1. If a person lends a certain amount at an interest, compounded annually, for 2 years at a rate of 20% p.a. instead of 25% p.a., then the interest payable will be less by:

- A. 24% B. 12.25% C. 19.25% D. 4.7% E. 21.77%

2. A tank is filled up to $\frac{2}{5}$ th of the capacity of tank with the mixture of two liquids, type A and type B in the ratio of 3 : 2. The tank has two inlet pipes i.e., one for type A liquid and other for type B liquid. Inlet of type A liquid and inlet of type B liquid can fill the same tank in 18 h and 12 h respectively. The capacity of the tank is 250 litres.

If both the inlet pipes are opened simultaneously, then what will be the final ratio of type A liquid and type B liquid in the completely filled tank?

- A. 14 : 15 B. 12 : 13 C. 11 : 13 D. 13 : 14 E. None of these

3. A tank is filled up to $\frac{2}{5}$ th of the capacity of tank with the mixture of two liquids, type A and type B in the ratio of 3 : 2. The tank has two inlet pipes i.e., one for type A liquid and other for type B liquid. Inlet of type A liquid and inlet of type B liquid can fill the same tank in 18 h and 12 h respectively. The capacity of the tank is 250 litres.

If the capacity of tank were 300 litres, then in how much time inlet of type B liquid can fill the empty tank?

- A. 14 h B. 15 h C. 16.9 h D. 14.4 h E. None of these

4. A dealer incurred a loss of 20%, when he allowed a discount of 25% on marked price of an article. Then what per cent discount should he allow on the marked price so as to gain Rs. 900 on the article, if the marked price of the article is Rs. 40,000?

- A. 5% B. 7% C. 6% D. 3% E. None of these

5. 20 men, 12 women and 18 boys were given a project of doing 3960 designs of a building in 5 days. The ratio of the number of designs made by them respectively in 1 day is 3 : 2 : 1. If on the 1st day all of them worked, on the 2nd day 4 women and 6 boys went absent and on the 3rd day, 6 men and 10 boys went absent but still the work got finished on the 3rd day. Then find the number of designs designed by them on the 3rd day?

- A. 1021 B. 1110 C. 1621 D. 1210 E. None of these

6. Rohit can row a boat 65Km upstream and 130 Km downstream in 23 hours, whereas he can swim 45 Km upstream and 104 Km downstream in 17 hours. Find the speed of boat in still water and the speed of stream.

- A. 4 km/h, 9 km/h B. 8 km/h, 5 km/h C. 9 km/h, 4 km/h D. 5 km/h, 8 km/h E. 10 km/h, 3 km/h

7. Mr. Tevatia buys goods at Himachal Pradesh at a discount of 20% on marked price. He has to pay certain kind of duties of 15% on the net cost he paid for goods bought. He marked a new price and earned a profit of 40% over his total expenses. What is the percentage change in the marked price?

- A. 32.20% B. 28.80% C. 30% D. 26.75% E. None of these

8. P, Q and R started a business by investing Rs.900, Rs.1300 and Rs.2000 respectively. After two years they invested another amounts in the ratio 3 : 1 : 5. After another 1 year, P, Q and R withdrew Rs.200, Rs.400 and Rs.1000 from the business respectively. Now the profit earned from the business after 4 years from the start of the business is in the ratio of 4 : 5 : a and share of P in the profit is Rs.1200. Find the total profit earned from the business.

- A. Rs. 4100 B. Rs. 5100 C. Rs. 4800 D. Rs. 5400 E. None of these

9. A mixture contains mango juice and water in the ratio 9 : 5 respectively. 28 litres of the mixture is replaced by water. Now the ratio of Mango juice and water became 18 : 17. Find the quantity of mango juice in the initial mixture.

- A. 90 litres B. 80 litres C. 60 litres D. 70 litres E. None of these

10. A and B together can complete a piece of work in 12 days, B and C together can complete a piece of work in 16 days, A and C together can complete a piece of work in 24 days. Find the number of days in which A, B and C together can complete the work.

- A. $\frac{31}{5}$ B. $\frac{32}{3}$ C. $\frac{32}{5}$ D. $\frac{31}{3}$ E. None of these

Correct Answers:

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

Explanations:

1. Earlier Interest Rate = 25% p.a.

$$\begin{aligned} \text{Therefore, the total interest would have gained in 2 years (applying net \% effect formula)} \\ = 25 + 25 + \frac{25 \times 25}{100} = 56.25\% \end{aligned}$$

$$\begin{aligned} \text{If the new rate of interest} = 20\% \text{ p.a. total interest will be gained in 2 years} \\ = 20 + 20 + \frac{20 \times 20}{100} = 44\% \end{aligned}$$

$$\text{Then, the interest payable is less by} = \frac{56.25 - 44}{56.25} \times 100 = 21.77\%$$

Hence, option E is correct.

2.

$$\text{Initially type A liquid} = \frac{2}{5} \times 250 \times \frac{3}{5} = 60\text{L}$$

$$\text{Type B liquid} = \frac{2}{5} \times 250 \times \frac{2}{5} = 40\text{L}$$

$$\text{Remaining capacity of tank} = 250 - 60 - 40 = 150\text{ L}$$

Ratio of Efficiency of both the inlet pipes

$$= \frac{1}{18} : \frac{1}{12} = 2 : 3$$

In remaining tank-

$$\text{Amount of type A liquid} = 150 \times \frac{2}{2+3} = 60\text{L}$$

$$\text{Amount of type B liquid} = 150 - 60 = 90\text{ L}$$

$$\text{Total A type liquid} = 60 + 60 = 120\text{ L}$$

$$\text{Total type B liquid} = 40 + 90 = 130\text{ L}$$

$$\text{Required ratio} = 120 : 130 = 12 : 13$$

Hence, option (B) is correct.

3. To fill 250 L inlet of type B liquid takes 12h.

So, to fill 300 L time taken by inlet of type B liquid
 $= 12 \times \frac{300}{250} = 14.4 \text{ h}$

Hence, option (D) is correct.

4. SP when 25% discount is allowed = 75% of 40,000 = Rs. 30,000

CP when there is loss of 20% = $30000 \times \frac{100}{80} = \text{Rs. } 37500$

SP to gain Rs.900 = Rs. (37500 + 900) = Rs. 38400

New Discount = Rs. (40000 – 38400) = Rs. 1600

Discount % = $1600 \times \frac{100}{40000} = 4\%$

Hence, option E is correct.

5. Let the number of designed by men, women and boys in 1 day be $3x$, $2x$ and x respectively.

Designs of building on the 1st day

$$\Rightarrow 20 \times 3x + 12 \times 2x + 18 \times x$$

$$\Rightarrow 102x$$

On the 2nd day = $20 \times 3x + 8 \times 2x + 12 \times x = 88x$

On the 3rd day = $14 \times 3x + 12 \times 2x + 8 \times x = 74x$

Now, $102x + 88x + 74x = 3960$

$$\Rightarrow 264x = 3960$$

$$\Rightarrow 74x = \frac{3960}{264} \times 74$$

$$\Rightarrow 74x = 1110$$

Hence, option B is correct.

6. Upstream, $U = \text{Speed of boat} - \text{speed of stream}$
Downstream, $D = \text{Speed of boat} + \text{speed of stream}$

$$\frac{65}{U} + \frac{130}{D} = 23$$

$$\frac{45}{U} + \frac{104}{D} = 17$$

On solving the above two equations, we will get

$$U = \text{Speed of boat} - \text{speed of stream} = 5$$

$$D = \text{Speed of boat} + \text{speed of stream} = 13$$

Thus, Speed of boat = 9 and speed of stream = 4

Hence, option C is correct.

7. Let the marked price at Himachal Pradesh be Rs. 100.

$$\therefore \text{Cost price} = 100 - 20\% \text{ of } 100 = \text{Rs. } 80.$$

He has to pay duties, then marked price = $80 + 15\% \text{ of } 80 = \text{Rs. } 92.$

Mr. Tevatia earned 40% on Rs. 92, thus new marked price = $140\% \text{ of } 92 = \text{Rs. } 128.80$

Thus, percentage change in marked price = 28.80%

Hence, option B is correct.

8. Let after 2 years amount invested by P, Q and R is '3x', 'x' and '5x' respectively.

$$\text{Ratio of share of P and Q} = [(900 \times 2) + (900 + 3x) + (900 + 3x - 200)] : [(1300 \times 2) + (1300 + x) + (1300 + x - 400)] = 4 : 5$$

$$\Rightarrow 17000 + 30x = 19200 + 8x$$

$$\Rightarrow x = 100$$

$$\text{Ratio of share of P and R} = [(900 \times 2) + (900 + 3x) + (900 + 3x - 200)] : [(2000 \times 2) + (2000 + 5x) + (2000 + 5x - 1000)] = 4 : a$$

$$\Rightarrow a = 4 \times \frac{7000 + 10x}{3400 + 6x}$$

$$\Rightarrow a = 8$$

$$\text{Total profit earned from the business} = 1200 \times \frac{4 + 5 + 8}{4} = \text{Rs. } 5100$$

Hence, option (B) is correct.

9. Let the quantity of mango juice and water in the initial mixture is $9x$ litres and $5x$ litres respectively.

$$\text{Quantity of mango juice in 28 litres mixture} = \frac{9}{14} \times 28 = 18 \text{ litres}$$

$$\text{Quantity of water in 28 litres mixture} = \frac{5}{14} \times 28 = 10 \text{ litres}$$

$$\frac{9x - 18}{5x - 10 + 28} = \frac{18}{17}$$

$$\Rightarrow \frac{9x - 18}{5x + 18} = \frac{18}{17}$$

$$\Rightarrow 153x - 306 = 90x + 324$$

$$\Rightarrow 63x = 324 + 306$$

$$\Rightarrow x = \frac{630}{63}$$

$$\Rightarrow x = 10$$

Quantity of mango juice in initial mixture = $9x = 9 \times 10 = 90$ litres.

Hence, option (A) is correct.

10. **Traditional approach:**

$$\frac{1}{A} + \frac{1}{B} = \frac{1}{12}$$

$$\frac{1}{B} + \frac{1}{C} = \frac{1}{16}$$

$$\frac{1}{A} + \frac{1}{C} = \frac{1}{24}$$

Adding all the above equations, we get

$$2 \left(\frac{1}{A} + \frac{1}{B} + \frac{1}{C} \right) = \frac{1}{12} + \frac{1}{16} + \frac{1}{24}$$

$$\Rightarrow 2 \left(\frac{1}{A} + \frac{1}{B} + \frac{1}{C} \right) = \frac{4 + 3 + 2}{48}$$

$$\Rightarrow \frac{1}{A} + \frac{1}{B} + \frac{1}{C} = \frac{9}{96}$$

$$\Rightarrow \frac{1}{A} + \frac{1}{B} + \frac{1}{C} = \frac{3}{32}$$

Hence, A, B and C together can complete the work in $32/3$ days.

Smart approach:

Total work = LCM of 12, 16 and 24 = 48

$$\text{Efficiency}(A + B) = \frac{48}{12} = 4$$

$$\text{Efficiency}(B + C) = \frac{48}{16} = 3$$

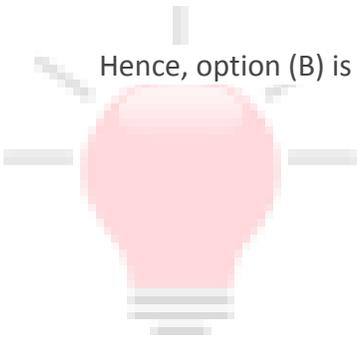
$$\text{Efficiency}(A + C) = \frac{48}{24} = 2$$

$$2 \times \text{Efficiency}(A + B + C) = 9$$

$$\text{Efficiency}(A + B + C) = \frac{9}{2}$$

$$\text{Required number of days} = \frac{48}{9/2} = \frac{96}{9} = \frac{32}{3} \text{ days}$$

Hence, option (B) is correct.



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