Maths Questions for CLAT Exam

CLAT Maths Quiz 24

Directions: Read the following Questions carefully and choose the right answer:

1. The sum of the numerator and denominator of a positive fraction is 12. If 3 is added to both numerator and denominator, the fraction is increased by 6/70. The difference of the numerator and denominator of fraction is:

A. 2 B. 3

C. 4 D. 5

2. If the population of women in a village is 80% of the population of men, then the population of men is what percent of the population of women?

A. 112% B. 118%

C. 125% D. None of these

3. On a certain sum of money the compound interest for 2 years is Rs. 290 and the simple interest for the same period of time is Rs. 265. Find the percentage of rate per annum?

A. 7.365% B. 18.86%

C. 10.267% D. 11.896%

4. A shoe company sold 60 pairs of shoes in a day costing Rs. 175.60 each for Rs. 12000 then the % profit obtained was?

A. 12.15% B. 13.31%

C. 13.89% D. 11.69%

5. A boat rows 60 km upstream in 12 hours and a distance of 56 km in 8 hours against the stream then the speed of stream is

A. 1 km/hour B. 2 km/hour

C. 3 km/hour D. 4 km/hour

6. A milkman used to add 30L of water in 20L of pure milk but due to complaints of the customers the milkman decided to change the ratio of milk and water in the mixture and decided that he will add only 20% water in the muxture. Find the quantity of water that needs to be replaced by milk if he sells the same volume as he used to sold initially?

A. 20 liters

B. 19 liters

C. 18 liters

D. None of these

7. Average of 40 numbers is 25. Average of first 25 numbers is 30. Average of next 13 numbers is 15. Find the sum of the last two numbers?

A. 50

B. 55

C. 58

D. 60

8. One pipe can fill a tank four times as fast as another pipe. If together two pipes can fill the tank in 72 minutes, then the slower pipe alone will be able to fill the tank in how much time?

A. 4 hours

B. 6 hours

C. 5 hours

D. 8 hours

9. Ratio of monthly incomes of A and B is 6 : 5 and their monthly expenditures are in the ratio 4 : 3. If each of them saves Rs. 500 per month. Find the sum of their monthly incomes?

A. 2700

B. 2750

C. 2600

D. 2300

10. PQ is a chord of a circle with centre O and SOR is a line segment originating from a point S on the circle and intersecting PQ produced at R such that QR = OS. If ∠QRO = 30° then ∠POS = ?

A. 40°

B. 70°

C. 90°

D. 60°

Correct Answers:

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

Explanations:

1. Sum of numerator & denominator = 12 Let numerator be x and denominator be y.

So, $x + y = 12$ .....(i)

$x = 12 - y$ .....(ii)

If 3 is added to both numerator & denominator fraction is increased by 6/70

Therefore, $\frac{x+3}{y+3} - \frac{x}{y} = \frac{6}{70}$

$\frac{xy + 3y - xy - 3x}{y(y+3)} = \frac{6}{70}$

$\frac{3y - 3x}{y(y+3)} = \frac{6}{70}$

$210y - 210x = 6y^2 + 18y$

Putting $x = 12 - y$ $210y - 210(12 - y) = 6y^2 + 18y$ $210y - 210 \times 12 + 210y$

$= 6y^2 + 18y$ $420y - 2520 = 6y^2 + 18y$

$\Rightarrow 6y^2 - 402y + 2520 = 0$

$\Rightarrow y^2 - 67y + 420 = 0$

$\Rightarrow y^2 - 60y - 7y + 420 = 0$

$\Rightarrow y(y - 60) - 7(y - 60) = 0$

$\Rightarrow (y - 7)(y - 60) = 0$ $y = 7, 60$ putting value of y is eq. 1 $x = 5, -48$

So, the required fraction is, $\frac{x}{y} = \frac{5}{7}$

Thus, the required difference between numerator and denominator = 7 – 5 = 2

Hence, option (A) is correct.

2. Let the population of men = X

& population of women be Y.

As, Population of women = 80% of population of men.

Y = 80% of X

$y = \frac{80}{100}x$

% population of men with respect to women $= \frac{100}{80} \times 100 = 125\%$

Hence, option (D) is correct.

3. As, C.I. for first year is equal to S.I. for First year, if rate and principal are equal.

Therefore, the gennated difference is because of 2nd year only.

The difference is due to the calculated interest on the interest of first year.

Let, two years C.I. = Y & S.I. = X

S.I for one year = X/2

So, S.I for one year = 265/2

$y - x = \left(\frac{X \times R \times 1}{100}\right)$, considering y as amount x as principal

$290 - 265 = \left(\frac{265 \times R}{200}\right)$

$\Rightarrow 290 - 265 = \frac{265R}{100}$

$\Rightarrow \frac{25 \times 200}{265} = R$

R = 18.86%

Hence, option (B) is correct.

4. Cost of 1pair of shoes = Rs. 175.60

So, cost of 60 pair of shoes = Rs. 175.60 × 60 = 10536

Selling price of 60 pairs = 12000

Profit = Selling Price – Cost price

= 12000 – 10536 = 1464

$\text{Profit \%} = \frac{\text{Profit}}{\text{C.P.}} \times 100$

$\text{Profit \%} = \frac{1464}{10536} \times 100 = 13.89\%$

Hence, option (C) is correct.

5. Speed of boat in upstream $= \frac{60}{12} = 5$ Kmph

Speed of boat in downstream $= \frac{56}{8} = 7$ Kmph

Speed of stream $= \frac{1}{2}$ (downstream –upstream)

$= \frac{1}{2}(7 - 5) = 1$ km/hour

Hence, option (A) is correct.

6. The total volume of mixture was = 30 L + 20 L = 50 L

In which 30 L was water and 20 L was Milk.

Thus, the percentage of milk was 40%

and, the percentage of water was 60%.

But we need 80% milk in the mixture.

And Here, 40% = 20 L

⇒ 10% = 5 L

⇒ 80% = 40 L

thus the total milk in the mixture needed = 40 L

Extra milk = 40 L – 20L = 20L

And we know that Milk the being added is reduced by water

Thus he have to replace 20L of water by milk.

Hence, option (A) is correct.

7. Average of 40 numbers = 25

So, sum of all 40 numbers = 40 × 25 = 1000

Average of first 25 number is 30

So, sum of first 25 number = 25 × 30 = 750

Average of Next 13 number = 15

Sum = 13 × 15 = 195

So, sum remaining last 2 number = 1000 – 750 + 195 = 55

Hence, option (B) is correct.

8. Let faster pipe can fill tank in x minutes

then, slower pipe will fill the same tank is = 4x minutes

Tank filled by both pipe together fill in 1 minute

$$\frac{1}{x}+\frac{1}{4x}=\frac{1}{72}=\frac{5x}{4x^2}=\frac{1}{72}$$

$\Rightarrow 5 \times 72 = 4x$

$$x=\frac{5\times 72}{4}=90$$

so, faster pipe alone can fill the tank in 90 minutes

Hence, Slower pipe alone will fill tank in = 4 × 90 minutes

⇒ 360 minutes ⇒ 6 hours

Hence, option (B) is correct.

9. Let the monthly incomes of A and B be 6x & 5x respectively.

Let the monthly expenditures of A and B be 4y & 3y

Income – expenditure = Saving

⇒ Income of A – Expenditure of A = Saving of A .....(i)

⇒ Income of B – Expenditure of B = Saving of B .....(ii)

As, saving of A = Saving of B

So, solving (i) and (ii)

we get

$\Rightarrow (6x - 4y) \times 3 = 500 \times 3$

$(5x - 3y) \times 4 = 500 \times 4,$

$18x - 12y = 1500$

$\underline{-20x + 12y = -2000}$ ...Subtracting

$-2x = -500$

$\Rightarrow x = 250$

Sum of monthly incomes $\Rightarrow$

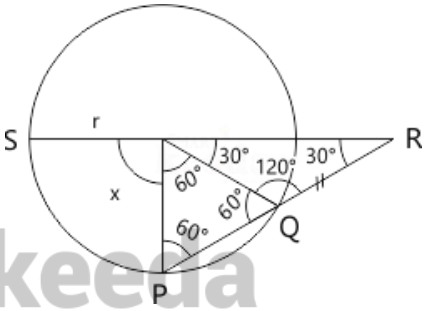
$6x + 5x = 11x = 11 \times 250 = 2750$

Hence, option (B) is correct.

10. Let radius be 'r' and $\angle POS = x°$

ΔOQR isosceles $\therefore \angle QOR = 30°$

$\therefore \angle OQR = 120°$ (Sum of all angles of $\Delta OQR = 180°$)



$\therefore \angle OQP = 60°$ (Supplementary angle)

ΔOPQ isosceles since OP = OQ = r

$\therefore \angle OQP = 60° = \angle OQP$

$\therefore \angle POQ = 60° =$ [Sum of all angle of $\Delta = 180°$]

Now SOR is a straight line

$\therefore x + 60° + 30° = 180°$

$\therefore x = 90°$

Hence, option (C) is correct.