Maths Questions for CLAT Exam.

CLAT Maths Quiz 42

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

1. $3 + \frac{1}{6}$ of $\left\{ 29 - (20 + 9 - 6) + \frac{1}{2}\ of 48 \right\} - 2 = ?$

A.8 B. $\frac{13}{6}$ C. 13 D. 6

2. The HCF and LCM of two numbers are respectively 12 and 2448. If the distance of the numbers is 60, their sum is

A. 348 B. 284 C. 248 D. 204

3. The average salary of all the workers in a workshop is Rs. 8000. The average salary of 7 technicians is Rs. 12000 and the average salary of the rest is Rs. 6000. The total number of workers in the workshop is

A. 20 B. 21 C. 22 D. 23

4. Arvind spent 75% of his income. His income is increased by 20% and he increases his expenditure by 10%. His savings are increased by

A. 10% B. 20% C. 30% D. 50%

5. Ram invested a particular sum of money at 12% per annum with one of his friends Shyam. The same amount is invested in a bank at 12% p.a. interest compounded semi - annually. The difference between the amounts received after one year was Rs. 1800. Find the total sum invested by Ram.

A. 850000 B. 1000000 C. 975000 D. 1200000

6. Out of a vessel full of wine. 10 L of wine is taken out, and is replaced by an equal amount of water. 10 L of the mixture is again taken out and is replaced by an equal amount of water. If the ratio between the remaining quantity of wine in the vessel to that of water is 49 : 32, then what is the capacity of the vessel?

A. 30 L B. 40 L C. 45 L D. 38 L

7. Two pipes A and B can fill a tank in 24 mins. and 32 mins respectively. If both the pipes are opened simultaneously, after how much time should B be closed so that the tank is full in 18 minutes?

A. 10 minutes. B. 15 minutes. C. 20 minutes. D. 8 minutes

8. If the speeds of Saurav and Sachin are 8 km/hr and 5 km/hr, respectively, then after what time will be two meet for the first time at the starting point, if they start simultaneously on a circular track of 500m.

A. 1800 sec. B. 1740 sec. C. 1580 sec. D. 1900 sec.

9. A broken part of a tree which touches the ground at certain point make angle 30° with horizontal. Distance between the root of tree and that certain point is 10m. What will be the height of tree (in m) now?

A. $\frac{10}{\sqrt{3}}$ m B. $\frac{9}{\sqrt{3}}$ m C. $10\sqrt{3}$ m. D. $\frac{7}{\sqrt{3}}$ m

10. If out of 20 numbers from 1 to 20, Mr X select a number at random. What is the probability that this number will be a multiple of 4?

A. $\frac{1}{2}$ B. $\frac{1}{3}$ C. $\frac{1}{4}$ D. $\frac{1}{5}$

Correct Answers:

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

Explanations:

1.

$$3 + \frac{1}{6}\text{of}\left\{29 - (20 + 9 - 6) + \frac{1}{2}\text{ of } 48\right\} - 2$$

$$= 3 + \frac{1}{6}\text{ of}\left\{29 - (20 + 3) + \frac{1}{2}\text{ of } 48\right\} - 2$$

$$= 3 + \frac{1}{6}\text{ of}\left\{29 - 23 + \frac{1}{2}\text{ of } 48\right\} - 2$$

$$= 3 + \frac{1}{6}\text{ of } (29 - 23 + 24) - 2$$

$$= 3 + \frac{1}{6}\text{ of } (30) - 2 = 3 + 5 - 2 = 6.$$

Hence, option D is correct.

2. Let two numbers be x and y

According to the question

Difference : x – y = 60.....(i)

Product : x × y = HCF × LCM = 12 × 2448 .....(ii)

Hence, their sum = x + y = $\sqrt{(x-y)^2+4xy}$

= $\sqrt{(60)^2 + 4 \times (12 \times 2448)}$

= $\sqrt{(12 \times 5)^2 + (4 \times 12 \times 12 \times 204)}$

= 12 $\sqrt{25+816}$

= 12 $\sqrt{841}$ = 12 × 29 = 348

Hence, option A is correct.

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3. Let the total number of workers be n
Then 8000n = 12000 × 7 + 6000 (n – 7)
⇒ n = 21
Hence, option B is correct.

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4. Let the income be Rs. 100.
Expenditure = Rs. 75 and savings = Rs. 25.

New income = Rs. 120

New expenditure = $\frac{110}{100} \times 75$ = Rs. $\frac{165}{2}$

New savings = $120 - \frac{165}{2}$ = Rs. $\frac{75}{2}$

increase in savings = $\frac{75}{2} - 25$ = Rs. $\frac{25}{2}$

Percentage increase in savings = $\frac{25}{2} \times \frac{1}{25} \times 100 = 50\%$

Hence, option D is correct.

5. Following the above illustration, we have the difference between the amounts equal to the interest on the interest paid on the principal for 6 months.

Rate of interest becomes $\frac{12}{2} = 6\%$

Interest paid for 6 months = $1800 \times \frac{100}{6}$ on principal = Rs. 30000

Principal/sum invested in bank = $30000 \times \frac{100}{6}$ = Rs. 500000

Total sum invested = 500000 + 500000 = Rs. 1000000

Hence, option B is correct.

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6. Let the capacity of the vessel be VI

$$\Rightarrow \frac{\text{Amount of wine left after II}^{nd}\text{ process}}{\text{Original amount}} = \left(1 - \frac{10}{V}\right)^2$$

$$\Rightarrow \frac{\text{Amount of wine left after IInd process}}{\text{Original amount}} = \left(1 - \frac{10}{V}\right)^2$$

$$\Rightarrow \frac{49}{81} = \left(1 - \frac{10}{V}\right)^2$$

$$\Rightarrow \frac{7}{9} = 1 - \frac{10}{V} \Rightarrow \frac{10}{V} = \frac{2}{9}$$

$\Rightarrow V = 45$ L

Hence, option C is correct.

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7. Let B be closed after x minutes. Then, part filled by (A + B) in x min. + part filled by A in (18 – x) min. = 1

$$\therefore x\left(\frac{1}{24} + \frac{1}{32}\right) + (18 - x) \times \frac{1}{24} = 1$$

$$\Rightarrow \frac{7x}{96} + \frac{18 - x}{24} = 1$$

$\Rightarrow 7x + 4(18 - x) = 96 \Rightarrow 3x = 24$

Hence, B must be closed after 8 minutes.

Hence, option D is correct.

8. Let the first calculate the time Saurav and Sachin individually take to complete one full circle on the track.

Time taken by Saurav = $\frac{500}{\left(8 \times \frac{5}{18}\right)}$ = 225 sec.

Time taken by Sachin = $\frac{500}{\left(5 \times \frac{5}{18}\right)}$ = 360 sec.

Hence, after every 225 sec, Saurav would be at the starting point and after every 360 sec, Sachin would be at the starting point. They will meet at the starting point for the first time in (LCM of 225 and 360) = 1800 sec. Thus, after every half an hour, they will meet at the starting point.
(From the solution you could have realized that it is immaterial whether they move in the same direction or in opposite direction).

Hence, option A is correct.

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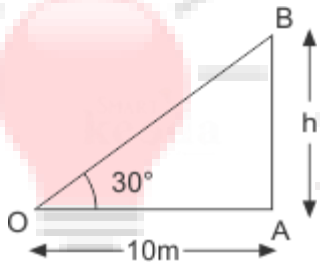
9. Let h be the height of the tree.



In ΔOAB,

$\frac{h}{10}$ = tan 30°

$\Rightarrow h = \frac{10}{\sqrt{3}}$ m

Hence, option A is correct.

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10. Total number of possible events (i.e., 1, 2, 3.....200 = 20
Total number of favourable events (4, 8, 12, 16 and 20) = 5

So, the reqd. probability = $\frac{5}{20} = \frac{1}{4}$

Hence, option C is correct.