Maths Questions for CLAT Exam

CLAT Maths Quiz 26

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

1. Sohan gets 3 marks for each correct question and loses 2 marks for each incorrect question and he got 40 marks. If the total number of questions were 30 then find the number of questions solved correctly?

A. 10 B. 20

C. 30 D. 40

2. While selling to the retailer, a company allows 25 % discount on the marked price of their products. If the retailer sells those products at the marked price, his profit % will be :

A. $42\frac{1}{7}\%$ B. 30%

C. 40% D. $33\frac{1}{3}\%$

3. A mixture contains milk and water in the ratio of 4 : 3. If 5 liters of water is added to the mixture then, the ratio becomes 4 : 5. The quantity of milk in the given mixture is

A. 5 liters B. 7 liters

C. 9 liters D. 10 liters

4. In a family of 16 adults and some minors, the average consumption of rice per head per month is 21.6 kg; while the average consumption of rice per head of adults is 30 kg and for minors it is 12 kg per head. The no. of minors in the family is

A. 14 B. 16

C. 18 D. 21

5. A certain sum of money amounts to Rs. 8280 in 2 years and to Rs. 9108 in 3 years at compound interest. The rate of interest per annum is

A. 10% B. 20%

C. 15% D. 35%

6. If two pipes together can fill a tank in 12 hours where first pipe fills the tank 10 hours faster than the other. How many hours will be taken by the faster pipe alone to fill the tank?

A. 10 hours

B. 15 hours

C. 20 hours

D. 25 hours

7. A man swims 20 km in a river in 4 hours with stream and return back in 20/3 hours. The rate at which he swims in still water is:

A. 1 kmph

B. 2 kmph

C. 3 kmph

D. 4 kmph

8. In an examination 35% students failed in Mechanics and 44% failed in electronics. If 25% failed in both the subjects, the percentage of students who passed in both the subjects was

A. 55%

B. 44%

C. 46%

D. 40%

9. A sphere of radius 3 cm is put into water contained in a cylinder of base radius 9 cm. If the sphere is completely immersed in the water, the water level of cylinder is displaced by

A. $\frac{4}{9}$ cm

B. $\frac{9}{4}$ cm

C. $\frac{6}{9}$ cm

D. $\frac{9}{6}$cm

10. A tower standing on a horizontal plane subtends a certain angle at a point 320m apart from the foot of the tower. On advancing 200m towards it, the tower is found to subtend an angle twice as before. The height of the tower is

A. 120 m

B. 125 m

C. 160 m

D. 180m

Correct Answers:

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

Explanations:

1. Let the no. of questions solved correctly be a.

So, $3 \times a - 2(30 - a) = 40$

$\Rightarrow 3a - 60 + 2a = 40$

$\Rightarrow 5a = 100$

$\therefore a = 20$

So, the number of questions attempted correctly are 20.

Therefore, option (B) is correct

2. Let the marked price of the product be Rs. 100.

Discount of 25 % is given to retailer, therefore, C.P of retailer is:

C.P. = Rs. 75

S.P. of the retailer = Rs. 100

$\therefore$ Gain percent $= \frac{25}{75} \times 100 = \frac{100}{3}$

$= 33\frac{1}{3}\%$

Hence, option D is correct.

3. Let, the quantity of milk and water in the original mixture be 4x and 3x litres respectively.

After adding 5 liters of water, we have

$$\frac{4x}{3x + 5} = \frac{4}{5}$$

$$\Rightarrow 20x = 12x + 20$$

$$\Rightarrow 8x = 20$$

$$\Rightarrow x = \frac{20}{8} = \frac{10}{4} = \frac{5}{2}$$

$$\therefore x = \frac{5}{2}$$

Now, the quantity of Milk in the mixture = $4x = 4 \times \frac{5}{2} = 10$ liters

Hence, option (D) is correct.

4. Let the no. of minors in the family be x.

$$\frac{16 \times 30 + x \times 12}{16 + x} = 21.6$$

$$\Rightarrow 480 + 12x = 21.6\ (16 + x)$$

$$\Rightarrow 480 + 12x = 345.6 + 21.6x$$

$$480 - 345.6 = 21.6x - 12x$$

$$\Rightarrow 134.4 = 9.6x$$

$$x = 14$$

So, no. of minors in the family of 16 adults is 14.

Hence, option (A) is correct.

5. Let the rate of interest be r % per annum.

According to the question,

As, Amount = Principal $(1 + \frac{r}{100})^n$

So,

$8280 = P\ (1 + \frac{r}{100})^2$ .....(i)

$\Rightarrow$ And

$9108 = P(1 + \frac{r}{100})^3$ .....(ii)

Dividing equation (ii) by equation (i)
we get

$1 + \frac{r}{100} = \frac{9108}{8280}$

$\frac{r}{100} = \frac{9108}{8280} - 1$

$\frac{r}{100} = \frac{9108 - 8280}{8280}$

$\frac{r}{100} = \frac{828}{8280}$

$\frac{r}{100} = \frac{1}{10} \Rightarrow r = 10\%$

So, the rate of compound interest = 10% per annum.

Hence, option (A) is correct.

6. Let the slower pipe fill the tank in x hours, then

$$\frac{1}{x}+\frac{1}{x-10}=\frac{1}{12}$$

$$\frac{x-10+x}{x\,(x-10)}=\frac{1}{12}$$

$\Rightarrow 12\,(2x-10)=x^2-10x \Rightarrow 24x-120=x^2-10x$

$\Rightarrow x^2-34x+120=0$

$\Rightarrow x^2-30x-4x+120=0$

$(x-4)\,(x-30)=0$

so, x = 30 hours

So the slower pipe fills the tank in 30 hours.

Hence, the faster pipe fills the tank in 30 – 10 = 20 hours

Therefore, option (C) is correct.

7. Let the speed of person in still water = x kmph and speed of current = y kmph

$\therefore x+y=\frac{20}{4}=5$ kmph .....(i)

&

$x-y=\frac{20}{6\frac{2}{3}}=\frac{20}{\frac{20}{3}}=3$kmph.....(ii)

Adding both eq. (i) & (ii)

we get $\Rightarrow 2x = 8$ kmph

$\Rightarrow x = 4$ kmph

So, the rate at which he swims in still water = 4 kmph

Hence, option (D) is correct.

8. Let the total no. of students who appeared in the examination be 100.

So, No. of students failed in mechanics = 35% of 100 = 35

No. of students failed in electronics = 44% of 100 = 44

No. of students failed in both the subjects = 25% of 100 = 25.

No. of students failed in mechanics, electronics both = 35 + 44 – 25 = 54

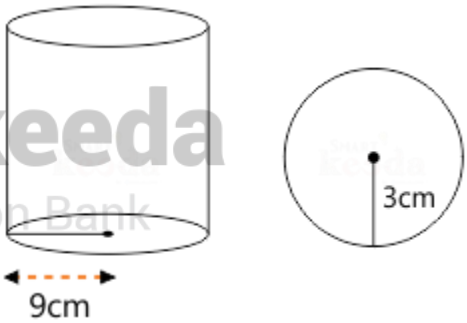
So, the no. of students passed in both = 100 – 54 = 46

So, the percentage of students passed in both the subjects are

$\Rightarrow \frac{46}{100} \times 100 \Rightarrow 46\%$

Hence, option (C) is correct.

9. The water displaced by sphere will be equal to the volume of sphere.



Volume of sphere = $\frac{4}{3}\pi r^3$

$= \frac{4}{3} \times \pi \times 3 \times 3 \times 3$

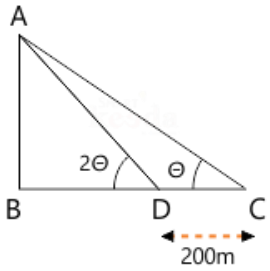
Volume of displaced water in cylinder= $\pi r^2 h = \pi \times 9 \times 9 \times h$ here, h is the height needed.

$\frac{4}{3} \times \pi \times 3 \times 3 \times 3 = \pi \times 9 \times 9 \times h$

$\Rightarrow h = \frac{4}{9}$

Hence, option (A) is correct.

10. AB = Tower = h meter.



CD = 200 meter

BC = 320

In Δ ABC $\Rightarrow \frac{AB}{BC} \Rightarrow \tan\Theta = \frac{h}{320}$.....(i)

In Δ ABD $\Rightarrow$

$$\tan 2\Theta = \frac{AB}{BD} = \frac{h}{120}$$

As we know,

$$\tan 2\Theta = \frac{2\tan\Theta}{1 - \tan^2\Theta}$$

So,

$$\tan 2\Theta = \frac{h}{120}$$

$$\frac{2\tan\Theta}{1 - \tan^2\Theta} = \frac{h}{120}$$

$$\Rightarrow \frac{2 \times \frac{h}{320}}{1 - \frac{h^2}{(320)^2}} = \frac{h}{120}$$

$$\Rightarrow \frac{\frac{h}{160}}{1 - \frac{h^2}{320 \times 320}} = \frac{h}{120}$$

$$\frac{h}{160} = \frac{h}{120} \times \left(1 - \frac{h^2}{320 \times 320}\right)$$

$$\frac{12}{16} = 1 - \frac{h^2}{320 \times 320}$$

$$\frac{h^2}{320 \times 320} = 1 - \frac{12}{16} = \frac{4}{16}$$

$$h^2 = \frac{320 \times 320}{4} = 320 \times 80$$

$h^2 = 25600 \Rightarrow h = 160m$

Hence, option (C) is correct.