Maths Questions for CLAT Exam

Directions: Kindly study the following Questions carefully and choose the right answer:

1. A steamer takes 36 minutes less to travel 36 miles downstream than to travel the same distance upstream. If the speed of the steamer in still water is 6 miles per minute the speed of the stream (miles per minute) is:

A. $\sqrt{37} + 1$

B. $\sqrt{37} - 1$

C. $\sqrt{27} - 1$

D. $\sqrt{37} - 3$

2. For what value of k is (x – 5) a factor of $x^3 - 3x^2 + kx - 10$?

A. −8

B. 4

C. 2

D. 1

3. Two-thirds of a consignment was sold at a profit of 6% while the rest at a loss of 3%. If there was an over all profit of Rs. 1080, the value of the consignment was

A. Rs. 25000

B. Rs. 40000

C. Rs. 35000

D. Rs. 36000

4. Abhishek Jain typed 50 pages at the rate of 30 pages per hour on Sunday. On Monday, he could only type 50 extra pages at the rate of 20 pages per hour. What has his average rate of typing been overall. Calculate in pages per hour?

A. 30

B. 24

C. 48

D. 35

5. Virat spent 14% of his income on electricity bills, 28% on rent and 18% on shopping. ¼ of the remaining amount is Rs. 5125. How much did he spend on electricity bill?

A. Rs. 8750

B. Rs. 8270

C. Rs. 6270

D. Rs. 7175

6. ABC is an equilateral triangle inscribed in a circle D is any point on the arc BC. What is ∠ADB equal to?

A. 90°

B. 60°

C. 45°

D. None of the above

7. Find the least number which when divided by 20, 25, 35 and 40 leaves remainders 14, 19, 29 and 34 respectively.

A. 1256

B. 1394

C. 1056

D. 956

8. Water flows into a tank 200m × 150 m through a rectangular pipe 1.5m × 1.25 m @ 20 kmph. In what time (in minutes) will the water rise by 2 meters?

A. 48 min.

B. 96 min

C. 114 min.

D. 126 min.

9. A telegraph post gets broken at a point against a storm and its top touches the ground at a distance 20 m from the base of the post making an angle 30° with the ground. What is the height of the post?

A. $\frac{40}{\sqrt{3}}$ m

B. 20√3 m

C. 40√3 m

D. 30 m

10. The simple interest on a sum of money will be Rs. 200 after 5 yr. In the next 5 yr, principal is tripled. What will be the total interest at the end of the 10th yr?

A. Rs. 650

B. Rs. 850

C. Rs. 800

D. Can't be determined

Correct Answers:

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

Explanations:

1. Let speed of the stream be x.

Rate downstream = 6 + x

Rate upstream = 6 − x

$\dfrac{36}{6 - x} - \dfrac{36}{6 + x} = 36.$

$\Rightarrow 6 + x - 6 + x = 36 - x^2$

$\Rightarrow 2x = 36 - x^2$

$\Rightarrow x^2 + 2x - 36 = 0$

By Sridharacharya's formula, roots of quadratic eq. $ax^2 + bx + c = 0$ will be

$$\dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Here, a = 1, b = 2 and c = − 36

Therefore, x = $\dfrac{-2 \pm \sqrt{(2)^2 - 4 \times 1 \times (- 36)}}{2 \times 1}$

$= \dfrac{-2 \pm \sqrt{148}}{2}$

$= \dfrac{-2 \pm 2\sqrt{37}}{2}$

$= \dfrac{2(-1 \pm \sqrt{37})}{2} = -1 \pm \sqrt{37} = \sqrt{37} - 1$

Hence, option B is correct.

2. Let $f(x) = x^3 - 3x^2 + kx - 10$

Now, $f(x)$ at $(x = 5)$

$\Rightarrow$ $f(x) = (5)^3 - 3(5)^2 + 5k - 10 = 0$

$\Rightarrow$ $125 - 3 \times 25 + 5k - 10 = 0$

$\Rightarrow$ $125 - 75 - 10 + 5k = 0$

$\Rightarrow$ $40 + 5k = 0$ $\Rightarrow$ $5k = -40$ $\Rightarrow$ $k = -8$.

Hence, option A is correct.

3. Let the value of consignment = x, then

$$SP = Rs.(\frac{2}{3} \times x \times \frac{106}{100} + \frac{1}{3} \times x \times \frac{97}{100})$$

$$= Rs.(\frac{212x}{300} + \frac{97x}{300}) = Rs.(\frac{309x}{300})$$

Now, according to the question,

$$\frac{309x}{300} - x = 1080 \Rightarrow \frac{9x}{300} = 1080$$

$$\therefore \quad x = \frac{1080 \times 300}{9} = Rs.\ 36000$$

Hence, option D is correct.

4. As per the question,

No. of hours Abhishek typed on Sunday = $\frac{50}{30} = \frac{5}{3}$

No. of hours Abhishek typed on Monday = $\frac{50}{20} = \frac{5}{2}$

Total hours of typing = $\frac{5}{3} + \frac{5}{2} = \frac{25}{6}$

Total pages typed = 50 + 50 = 100

Average rate of typing = $\dfrac{100}{\dfrac{25}{6}}$ = 6 × 4 = 24

Hence, Abhishek Jain typed 24 pages per hour.

Hence, option B is correct.

5.   Let the initial amount be Rs. 100%

Then, $\dfrac{1}{4}$ [100 – (14 + 28 + 18)]% ≡ 5125

⇒ $\dfrac{1}{4}$ × 40% ≡ 5125

⇒ 10% ≡ 5125 (Remaining amount)

14% ≡ x (Electricity amount)

On cross multiplication, we get

= x = ($\dfrac{14 \times 5125}{10}$) = Rs. 7175.

Hence, option (D) is correct.

6.
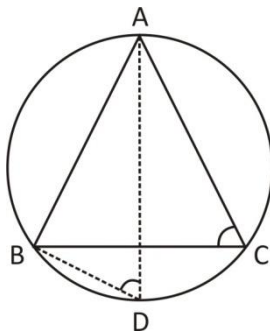
∠ADB = ∠ACB = 60°

(angles in the same segment are equal)

Hence, option B is correct.

7. Here, (20 – 14) = 6, (25 – 19) = 6, (35 – 29) = 6 and (40 – 34) = 6.

Required number = (L.C.M. of 20, 25, 35, 40) – 6

∴ Required number = 1400 – 6 = 1394.
Hence, option B is correct.

8. Volume required in the tank (200 × 150 × 2) = 60000m^3

Length of the water column flown in 1 min. = $(\dfrac{20 \times 1000}{60})$m $\Rightarrow \dfrac{1000}{3}$m.

Volume flows per minute $= (1.5 \times 1.25 \times \dfrac{1000}{3})$ m^3 $\Rightarrow$ 625 m^3.

∴ Reqd. time = $(\dfrac{60000}{625})$min. $\Rightarrow$ 96 min.

Hence, option B is correct.

9.
Given,   BC = 20 m
            ∠ACB = 30°
Total height of the telegraph post is (AB + CA) = ?

In ΔABC, $\tan 30° = \dfrac{AB}{BC}$

            $\dfrac{1}{\sqrt{3}} = \dfrac{AB}{20}$

∴ $AB = \dfrac{20}{\sqrt{3}}$ m

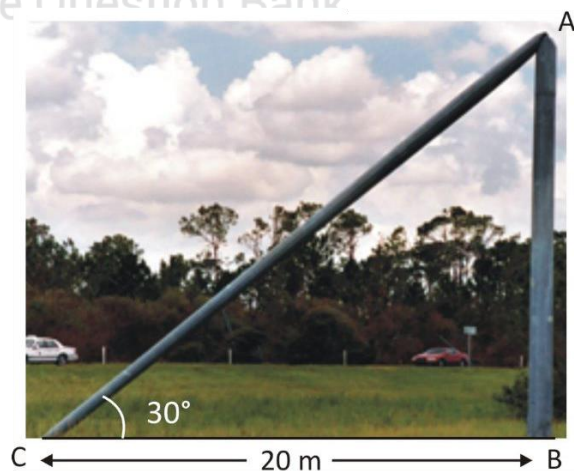Now, $\cos 30° = \dfrac{BC}{AC}$

            $\dfrac{\sqrt{3}}{2} = \dfrac{20}{AC}$

∴ $AC = \dfrac{40}{\sqrt{3}}$ m

So, $AB + CA = \dfrac{20}{\sqrt{3}} + \dfrac{40}{\sqrt{3}} = \dfrac{60}{\sqrt{3}}$

            $= 20\sqrt{3}$ m

Hence, option B is correct.

10.   According to the question,

SI for first 5 yrs = Rs. 200

SI for next 5 yrs = Rs. 200 × 3 = Rs. 600

∴   Total SI for 10 yr = Rs.(200 + 600*) = Rs.800.

*When principal is trebled, then SI for 5 yr will also be treble and hence SI for next 5 yr will be Rs. (200 × 3) = Rs. 600

Hence, option C is correct.