Maths Questions for CLAT Exam

CLAT Maths Quiz 22

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

1. In the new budget, the price of Refined oil rose by 25%. By how much percent must a person reduce his consumption so that his expenditure on it does not increase?

A. 10%

B. 20%

C. 25%

D. 30%

2. The length of the common chord of two intersecting circles is 24 cm. If the diameter of the circles are 30 cm and 26 cm, then the distance between the centre (in cm) is

A. 13

B. 14

C. 15

D. 16

3. Three planets revolve round the Sun once in 200, 250 and 300 days, respectively in their own orbits. When do they all come relatively to the same position as at a certain point of time in their orbits?

A. After 3000 days

B. After 2000 days

C. After 1500 days

D. After 1200 days

4. The length of canvas 75 cm wide required to build a conical tent of height 14 m and the floor area 346.5 m2 is:

A. 490 m

B. 860 m

C. 665 m

D. 770 m

5. From a point P on the ground the angles of elevation of the top of a 10 m tall building is 30°. A flag is hoisted at the top of the building and the angle of elevation of the top of the flagstaff from P is 45° Find the length of the flagstaff. (Take √3 = 1.732)

A. 10(√3 + 2) m

B. 10(√3 + 1) m

C. 10√3 m

D. 7.32 m

6. ABCD is a cyclic trapezium such that AD || BC, if ∠ABC = 70°, then the value of ∠BCD is:

A. 60°

B. 70°

C. 40°

D. 80°

7. If $x^2 + y^2 + 1 = 2x$, then the value of $x^3 + y^5$ is

A. 2

B. 0

C. – 1

D. 1

8. Find the compound interest on Rs. 7500 in 2 years at 6% per annum, the interest being compounded half-yearly.

A. Rs. 941.31

B. Rs. 834.44

C. Rs.746.21

D. Rs. 764

9. Rs. 16000 was invested for three years, partly in scheme A at the rate of 5% simple interest per annum and partly in scheme B at the rate of 8% simple interest per annum. The total interest received at the end was Rs. 3480. What amount of money was invested in scheme A ?

A. Rs. 6000

B. Rs. 6500

C. Rs. 4500

D. Rs. 4000

10. P, Q, R and S are four consecutive odd numbers and their average is 88. What is the product of Q and R?

A. 7860

B. 7890

C. 7743

D. 7677

Correct Answers:

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

Explanations:

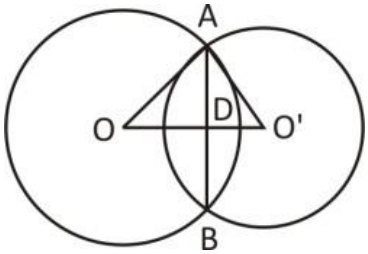
1. Where R ⇒ the rose price of refined oil = 25%

Reduction in consumption =$[\frac{R}{(100 + R)} \times 100]$%.

⇒$\left(\frac{25}{125} \times 100\right)$% = 20%.

Hence, option (B) is correct.

2. Given, Common chord AB = 24 cm



Then, AD = DB = 12 cm

Diameter of circle of centre O = 30 cm,

Then radius OA = 15 cm

And, Diameter of circle of centre O' = 26 cm, Then radius O'A = 13 cm

From ΔOAD, By pythagoras theorem

OD = $\sqrt{OA^2 - AD^2}$ = $\sqrt{15^2 - 12^2}$ = $\sqrt{81}$ = 9 cm

From ΔO'AD, By pythagoras theorem

O'D = $\sqrt{OA^2 - AD^2}$ = $\sqrt{13^2 - 12^2}$ = $\sqrt{25}$ = 5 cm

∴ OO' = OD + O'D = 9 + 5 = 14 cm

Hence, option B is correct.

3. Given that, three planets revolves the Sun once in 200, 250 and 300 days, respectively in their own orbits.

∴ Required time = LCM of (200, 250 and 300) = 3000 days

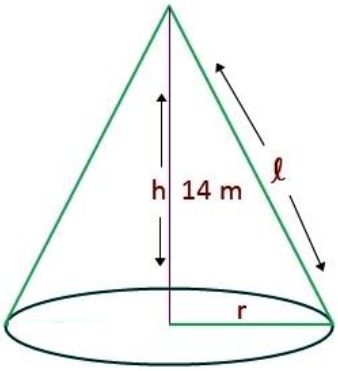
Hence, after 3000 days they all come relatively to the same position as at a certain point of time in their orbits.

Hence, option A is correct.

4. Given, h = 14 m and $\pi r^2 = 346.5$

$= \frac{3465}{10} \Rightarrow r^2 = \frac{3465}{10} \times \frac{7}{22} \Rightarrow r^2 = \frac{441}{4}$

$r = \frac{21}{2}$



Therefore, slant height (l) = $\sqrt{r^2 - h^2}$

$= \sqrt{\frac{441}{4} + 196} = \frac{\sqrt{1225}}{4} = \frac{35}{2}$

Area of tent (which is a cone) = Area of canvas (which is a rectangle)

πrl = length of canvas × 0.75 m (breadth)

$\Rightarrow \frac{22}{7} \times \frac{21}{2} \times \frac{35}{2} = \frac{3}{4} \times$ length

On solving the equation, we get

Length of canvas = 770 m.

Hence, option D is correct.

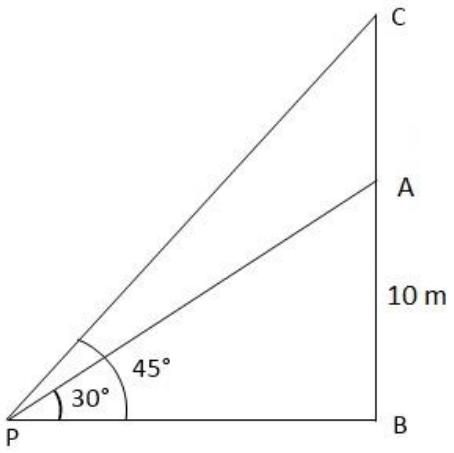
5. AC = Flag, AB = building = 10 m

∠APB = 30°; ∠CPB = 45°

In Δ APB,

$\tan 30° = \frac{AB}{PB}$

$\Rightarrow \frac{1}{\sqrt{3}} = \frac{10}{PB}$



$\Rightarrow PB = 10\sqrt{3}$ m

In ΔPBC,

$\tan 45° = \frac{BC}{PB}$

$\Rightarrow 1 = \frac{AB + AC}{PB}$

$\Rightarrow PB = AB + AC \Rightarrow 10\sqrt{3} = 10 + AC$

$\Rightarrow AC = 10\sqrt{3} - 10$

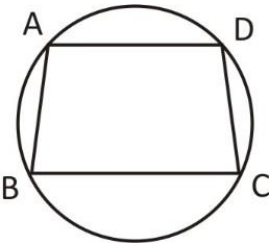
$\Rightarrow 10(\sqrt{3} - 1)$ m $= 10(1.732 - 1)$ m

$= 10 \times 0.732 = 7.32$ m.

Hence, option D is correct.

6. $\angle ABC + \angle CDA = 180°$

$\angle CDA = 180° - \angle ABC = 180° - 70° = 110°$



We know that,

$\angle BCD + \angle CDA = 180°$

$\therefore \angle BCD = 180° - \angle CDA = 180° - 110° = 70°$

Hence, option B is correct.

7. $x^2 + y^2 + 1 = 2x$

$\Rightarrow x^2 + y^2 + 1 - 2x = 0$

$\Rightarrow x^2 - 2x + 1 + y^2 = 0$

$\Rightarrow (x - 1)^2 + y^2 = 0$

In the above eq. the L.H.S. can only become zero when the base of terms; $(x - 1)$ and y becomes zero because for any other value the sum of their squares will always be a positive integer.

Taking $(x - 1) = 0$
and $y = 0$

Therefore, $x = 1$ and $y = 0$

$\therefore x^3 + y^5 = 1 + 0 = 1$.

Hence, option D is correct.

8. When interest is compounded Half-yearly. then,

$\text{Amount} = P[1 + \frac{(R/2)}{100}]^{2T}$

Principal = Rs. 7500; Rate = 3% per half - year; Time = 2 years = 4 half - years.

So, Amount = Rs. $[7500 \times (1 + \frac{3}{100})^4]$

$\Rightarrow \text{Rs.}(7500 \times \frac{103}{100} \times \frac{103}{100} \times \frac{103}{100} \times \frac{103}{100})$

$\Rightarrow$ Rs. 8441.31
$\Rightarrow$ C.I = Rs. (8441.31 - 7500) = Rs. 941.31.

Hence, option A is correct.

9. Let the sum invested in scheme A be Rs. x.

Then the amount invested in scheme B = Rs. (16000 – x)

$\text{Now}, \frac{x \times 5 \times 3}{100} + \frac{(16000 - x) \times 3 \times 8}{100} = 3480$

$\Rightarrow 15x + 384000 - 24x = 3480 \times 100$

$\Rightarrow 9x = 384000 - 348000 = 36000$

$\therefore x = \frac{36000}{9} = \text{Rs. } 4000$

Hence, option D is correct.

10. $\Rightarrow$ Average of P, Q, R and S = 88

$\Rightarrow P + Q + R + S = 352$ ----- (1)

$\because$ P, Q, R and S are consecutive odd numbers

$\Rightarrow Q = P + 2$

$\Rightarrow R = Q + 2 = P + 4$

$\Rightarrow S = R + 2 = P + 6$

Substituting the above values in (1)

$\Rightarrow P + P + 2 + P + 4 + P + 6 = 352$

$\Rightarrow 4P + 12 = 352$

$P = \frac{340}{4} = 85$

$\therefore Q = 87$; $R = 89$ and $S = 91$

$\Rightarrow Q \times R = 87 \times 89 = 7743$

Hence, option C is correct.