MENSURATION BASED QUANTITATIVE APTITUDE PRACTICE QUESTIONS AND ANSWERS PDF WITH EXPLANATION

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Q1. Consider the following statements

I. The locus of points which are equidistant from two parallel lines is a line parallel to both of them and drawn mid way between them.
II. The perpendicular distances of any point on this locus line from two original parallel lines are equal. Further, no point outside this locus line has this property.

Which of the above statements is/are correct?

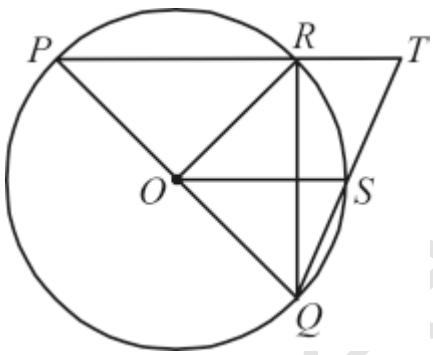
a) Both I and II

b) Only I

c) Only II

d) Neither I nor II

Q2. In the figure given below, PQ is a diameter of the circle whose centre is at O. If ∠ROS = 44° and OR is a bisector of ∠PRQ, then what is the value of ∠RTS?

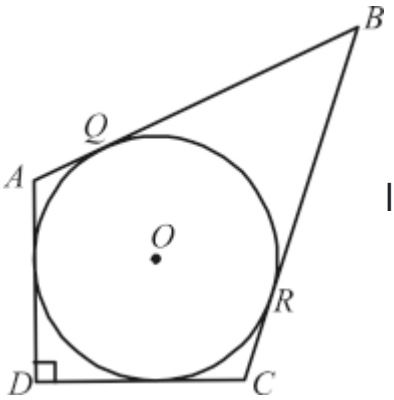


a) 69°

b) 46°

c) 64°

d) None of these

Q3. 

In the figure given above, a circle is inscribed in a quadrilateral ABCD. Given that, BC = 38 cm, QB = 27 cm, DC = 25 cm and AD is perpendicular to DC. What is the radius of the circle?

a) 15 cm

b) 11 cm

c) 14 cm

d) 16 cm

Q4. The area of the largest triangle that can be inscribed in a semicircle of radius r is

a) $3r^2$

b) r^2

c) $2r^2$

d) $4r^2$

Q5. A wire is in the form of a circle of radius 42 cm. If it is bent into a square, then what is the side of the square?

a) 36 cm

b) 66 cm

c) 42 cm

d) 33 cm

Q6. If the area of a circle inscribed in an equilateral triangle is 154 sq cm, then what is the perimeter of the triangle?

a) 21 $\sqrt{3}$ cm

b) 21 cm

c) 42 $\sqrt{3}$ cm

d) 42 cm

Q7. From a solid cylinder of height 4 cm and radius 3 cm, a conical cavity of height 4 cm and of base radius 3 cm is hollowed out. What is the total surface area of the remaining solid?

a) 33 π sq cm

b) 15 π sq cm

c) 22 π sq cm

d) 48 π sq cm

Q8. Three lines intersect each other in pairs. What is the number of angles so formed?

a) 9

b) 3

c) 6

d) 12

Q9. If the angle between the radii of a circle is 130°, then the angle between the tangents at the ends of the radii is

a) 50°

b) 90°

c) 70°

d) 40°

Q10. If the side of a cube is increased by 100%, then by what percentage is the surface area of the cube increased ?

a) 300%

b) 150%

c) 200%

d) 400%

Q11. What is the height of a solid cylinder of radius 5 cm and total surface area is 660 sq cm?

a) 15 cm

b) 10 cm

c) 12 cm

d) 16 cm

Q12. A village having a population of 4000 requires 150 litres of water per head per day. It has a tank measuring 20 m × 15 m × 6 m. The water of this tank will last for

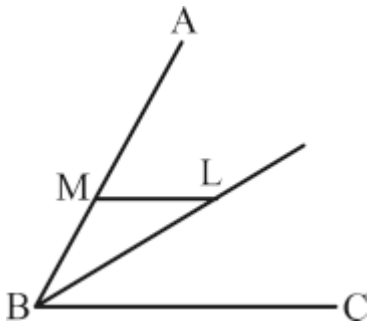
a) 4 days

b) 2 days

c) 3 days

d) 5 days

Q13. In the given figure, L is any point on the bisector of the acute angle ABC and the line ML is parallel to BC. Which one of the following is correct?



a) The ΔBML is isosceles but not right angled

b) The Δ BML is equilateral

c) The ΔBML is isosceles but right angled

d) The Δ BML is not isosceles

Q14. A semi-circular plate is rolled up to form a conical surface. The angle between the generator and the axis of the cone is

a) 30°

b) 60°

c) 45°

d) 15°

Q15. The radius of the wheel of a bus is 70 cms and the speed of the bus is 66 km/h, then the r.p.m. (revolutions per minutes) of the wheel is

a) 300

b) 200

c) 250

d) 330

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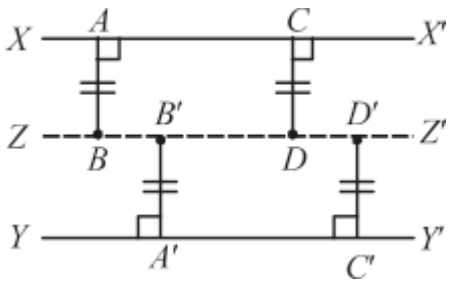
Answers to the above questions :

Q1. Answer: (a)

Statements I and II are both true, because the locus of points which are equidistant from two parallel lines is a line parallel to both of them and draw mid way between them.



Also, it is true that the perpendicular distances of any point on this locus line from two original parallel lines are equal. Further, no point outside this locus line has this property.

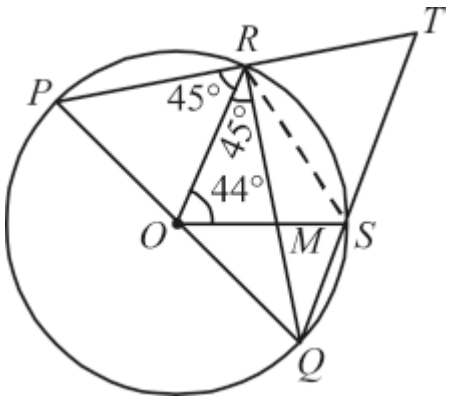
Q2. Answer: (d)

Since, OR is a bisector of ∠PRQ.

$\therefore \angle PRO = \angle ORQ = 45°$

Also, OP = OR

$\therefore \angle OPR = 45°$



In ΔORS,

OR = OS $\Rightarrow \angle ORS = \angle OSR = \frac{180° - 44°}{2} = 68°$

$\therefore \angle MRS = 68° - 45° = 23°$

$\Rightarrow \angle PRS = 90° + 23° = 113°$

By properties of cyclic quadrilateral.

$\angle PRS + \angle PQS = 180°$

$\Rightarrow \angle PQS = 180° - 113° = 67°$

In ΔPTQ,

$\angle QPT + \angle PQT + \angle PTQ = 180°$

$\Rightarrow \angle PTQ = 180° - 45° - 67° = 68°$

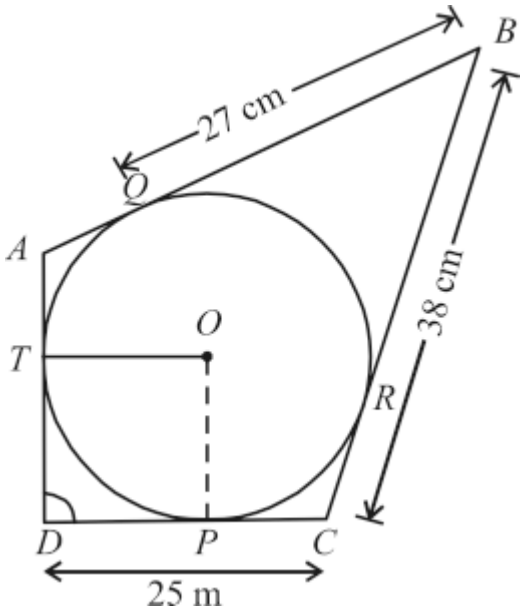
Q3. Answer: (c)

Given BC = 38 cm

QB = 27 cm

DC = 25 cm

AD ⊥ DC



We know that tangents are always equal, when they drawn to the circle from a point outside the circle.

∴ BQ = BR = 27 cm

RC = BC – BR = 38 – 27 = 11 cm

RC = PC = 11 cm

DC = 25 cm

DP = DC – PC = 25 – 11 = 14 cm

DP = OT = OP

∴ Radius of the circle = 14 cm

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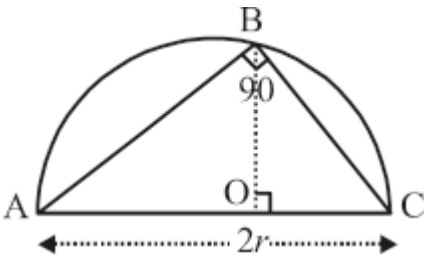
Q4. Answer: (b)



Let ABC is triangle, which have maximum area, while

AC is 2r

But OB = OC = r

By Pythagoras theorem

$OB^2 + OC^2 = BC^2$

BC = $\sqrt{2}$r = AC

Area of triangle = $\frac{1}{2} \times \sqrt{2}r \times \sqrt{2}r = r^2$

Q5. Answer: (b)

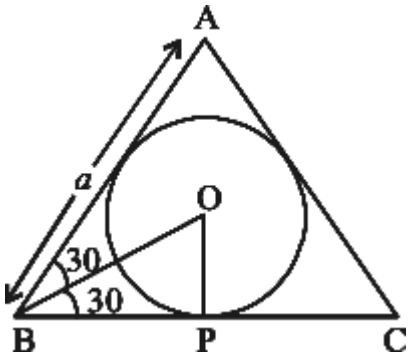
Circumference of circle = 2π × 42

$= 2 \times \frac{22}{7} \times 42$ = 264 cm

Perimeter of square = 4x ⇒ 264 = 4x

x = 66 cm

Q6. Answer: (c)



Here OP is radius of circle and given triangle is equilateral.

$\therefore$ BP = $\frac{a}{2}$

In ΔBOP,

tan 30° = $\frac{OP}{BP}$

OP = BP tan 30

= $\frac{a}{2} \times \frac{1}{\sqrt{3}} = \frac{a}{2\sqrt{3}}$ = radius.

Now, Area of circle = πr^2

154 = π × $\left(\frac{a}{2\sqrt{3}}\right)^2$

$\Rightarrow$ 154 = π $\frac{a^2}{12}$

$\Rightarrow$ 154 = $\frac{22}{7} \times \frac{a^2}{12}$

a = $\sqrt{7 \times 7 \times 12}$

= $7 \times 2\sqrt{3} = 14\sqrt{3}$

Perimeter of triangle = 3

= $3 \times 14\sqrt{3} = 42\sqrt{3}$

Q7. Answer: (d)

Total surface area = Curved surface area of cylinder + Curved surface area of cone + Top surface area of cylinder

= 2 πrh + πrl + π r^2

= π(2 × 3 × 4 × + 3 $\sqrt{3^2 + 4^2}$ + 3^2)

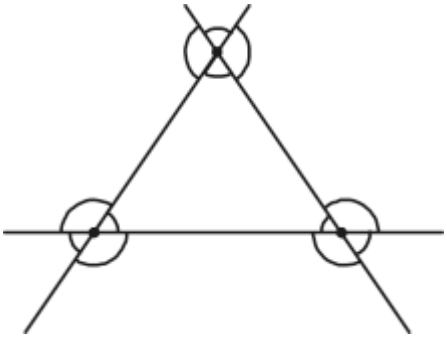
(∵l = $\sqrt{r^2 + h^2}$)

= π(24 + 15 + 9) = 48πsq cm

Q8. Answer: (d)

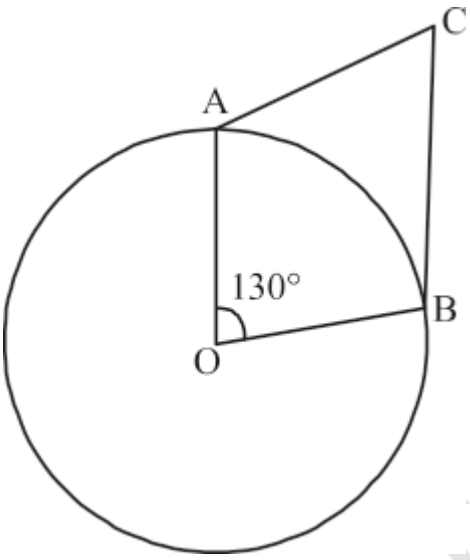
We know that, when two lines intersect each other it makes 4 angles.

The total number of pairs = 3



∴ Total number of angles = 3 × 4 = 12

Q9. Answer: (a)



OA and OB are radii of circle, AC and BC are tangents

Now, ∠AOB + ∠ACB = 180°

∠ACB = 180° – 130° = 50°

Q10. Answer: (a)

x + y + $\frac{xy}{100}$

= 100 + 100 + $\frac{100 \times 100}{100}$

= 200 + 100 = 300%

Q11. Answer: (d)

Radius (r) = 5 cm

Total surface area = 660 cm^2

⇒ 2πrh + 2πr^2 = 660

⇒ 2πr (h + r) = 660

⇒ (h + 5) = $\frac{330}{5\pi} = \frac{330}{5} \times \sim \frac{7}{22}$

⇒ h = $\frac{66 \times 7}{22}$ - 5 = 21 - 5 = 16cm.

Q12. Answer: (c)

Volume of tank = 20 × 15 × 6 m^3

= 20 × 15 × 6 × 1000 litre

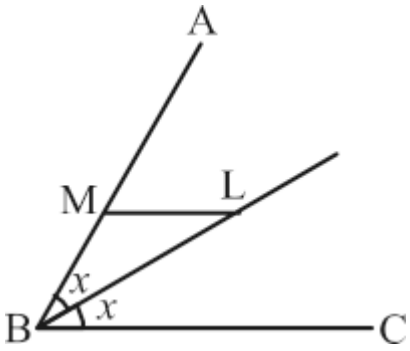
∴ The water of the tank will last for

$\frac{20 \times 15 \times 6 \times 1000}{150 \times 4000}$ days.

i.e. The water of the tank will last for 3 days.

Q13. Answer: (a)

Since, BL is bisector of ∠ABC.



∠MBL = ∠LBC = x (say)

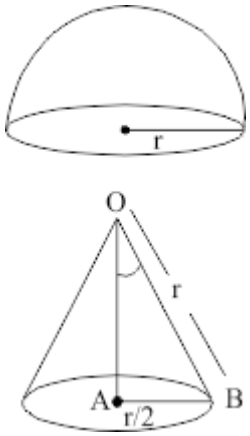
Also, ML ||BC

∠LBC = ∠MLB = x ⇒ ∠MLB = ∠MBL

ΔBLM is an isosceles triangle and ∠BML need not to be 90°.

ΔBML is isosceles but not right angled.

Q14. Answer: (a)



Since, the radius of semicircle = slant height of the cone = r

And the circumference of semicircle = circumference of base of cone.

πr = 2πR ⇒ $\frac{r}{2}$ = R.

In ΔOAB

sin θ = $\frac{R}{r} = \frac{\frac{r}{2}}{r} = \frac{1}{2}$ = sin 30°

θ = 30°

Q15. Answer: (c)

Radius of the wheel of bus = 70 cm. Then,

circumference of wheel = 2 πr = 140 π = 440 cm

Distance covered by bus in 1 minute

$= \frac{66}{60} \times 1000 \times 100$ cms

Distance covered by one revolution of wheel

= circumference of wheel

= 440 cm

$\therefore$ Revolutions per minute $= \frac{6600000}{60 \times 440} = 250$