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# Circles Questions for CDS, SSC & Railway Exams

## Circle Quiz 1

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

1. The diameter of a circle with centre at C is 50 cm. CP is a radial segment of the circle. AB is a chord perpendicular to CP and passes through P. CP produced intersects the circle at D. If DP = 18 cm, then what is the length of AB?

- A. 24 cm                      B. 32 cm                      C. 40 cm                      D. 48 cm

2. A circle of radius 10 cm has an equilateral triangle inscribed in it. the length of the perpendicular drawn from the centre to any side of the triangle is

- A.  $2.5\sqrt{3}$  cm                      B.  $5\sqrt{3}$  cm                      C.  $10\sqrt{3}$  cm                      D. None of these

3. In a  $\Delta ABC$ ,  $AB = BC = CA$ . The ratio of the radius of the circumcircle to that of the incircle is

- A. 2 : 1                      B. 3 : 1                      C. 3 : 2                      D. None of these

4. Consider the following statements

- I. The tangent of a circle is a line that meets the circle in one and only one point.  
II. The tangent of a circle at the end point of the diameter is perpendicular to the diameter.

Which of the above statements is/are correct?

- A. Only I                      B. Only II                      C. Both I and II                      D. Neither I nor II

5. A regular hexagon is inscribed in a circle of radius 5 cm. If  $x$  is the area inside the circle but outside the regular hexagon, then which one of the following is correct?

- A.  $13 \text{ cm}^2 < x < 15 \text{ cm}^2$                       B.  $15 \text{ cm}^2 < x < 17 \text{ cm}^2$                       C.  $17 \text{ cm}^2 < x < 19 \text{ cm}^2$   
D.  $19 \text{ cm}^2 < x < 21 \text{ cm}^2$

6. AB and CD are two chords of a circle meeting externally at P. Then, which of the following is/are correct?

I.  $PA \times PD = PC \times PB$

II.  $\Delta PAC$  and  $\Delta PDB$  are similar.

Select the correct answer using the codes given below.

- A. Only I                      B. Only II                      C. Both I and II                      D. Neither I nor II

7. Consider the following statements

I. The perpendicular bisector of a chord of a circle does not pass through the centre of the circle.

II. The angle in a semi-circle is a right angle.

Which of the statements given above is/are correct?

- A. Only I                      B. Only II                      C. Both I and II                      D. Neither I nor II

8. Consider a circle with centre at O and radius r. Points A and B lie on its circumference and a point M lies outside of it such that M, A and O lie on the same straight line. Then, the ratio of MA to MB is

- A. equal to 1                      B. equal to r                      C. greater than 1                      D. less than 1

9. Consider the following statements in respect of two chords XY and ZT of a circle intersecting at P.

I.  $PX \cdot PY = PZ \cdot PT$

II.  $PXZ$  and  $PTY$  are similar triangles.

Which of the statements given above is/are correct?

- A. Only I                      B. Only II                      C. Both I and II                      D. Neither I nor II

10. ABC is an equilateral triangle inscribed in a circle D is any point on the arc BC. What is  $\angle ADB$  equal to?

- A.  $90^\circ$                       B.  $60^\circ$                       C.  $45^\circ$                       D. None of the above

**Correct Answers:**

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>
D	D	A	C	A	D	B	D	C	B

**Explanations:**

**1.**

In  $\triangle ACP$

$$CP = CD - PD = 25 - 18 = 7$$

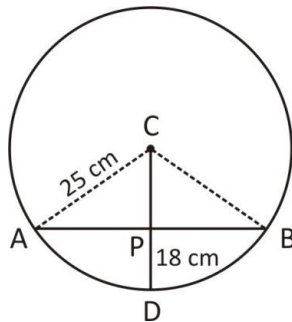
$$\text{Now, } AC^2 = CD^2 + AP^2$$

$$\therefore AP = \sqrt{AC^2 - CD^2} = \sqrt{(25)^2 - (7)^2}$$

$$= \sqrt{625 - 49} = \sqrt{576} = 24 \text{ cm}$$

Similarly,  $PB = 24 \text{ cm}$

$$\begin{aligned} \therefore AB &= AP + PB \\ &= 24 + 24 \\ &= 48 \text{ cm.} \end{aligned}$$



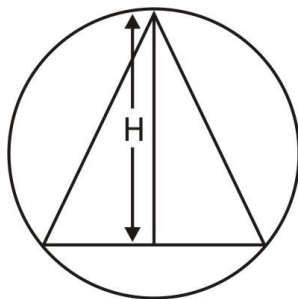
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Hence, option D is correct.

**2.**

$$\text{Circumradius} = \frac{2}{3} \times \text{Height}$$

$$\therefore \text{Height} = \frac{10 \times 3}{2} = 15 \text{ cm}$$



So,

length of perpendicular drawn from center

$$= 15 - 10 = 5 \text{ cm.}$$

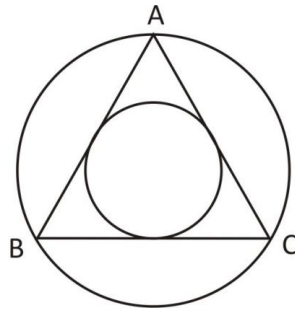
Hence, option D is correct.

3.

In  $\triangle ABC$ ,

$$AB = BC = AC$$

Hence,  $\triangle ABC$  is equilateral triangle.



Let  $r$  be the radius of incircle and  $R$  be the radius of circumcircle.

$$\text{Now, radius of incircle, } r = \frac{\text{Side } AB}{2\sqrt{3}} = \frac{AB}{2\sqrt{3}}$$

$$\text{and radius of circumcircle, } R = \frac{\text{Side } AB}{\sqrt{3}} = \frac{AB}{\sqrt{3}}$$

$$\text{So, the required ratio} = \frac{R}{r} = \frac{AB/\sqrt{3}}{AB/2\sqrt{3}} = \frac{2}{1}$$

$$= 2 : 1.$$

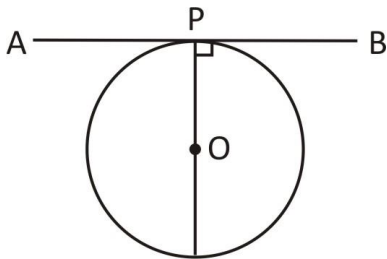
Hence, option A is correct.

4.

By definition of tangent,

A tangent to a circle is straight line that touches the circle at a single point. Also, tangent at the end points of a diameter of a circle is perpendicular to the diameter.

So, both statements are correct.



Hence, option C is correct.

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5.

$OB = OA = \text{radius}$

$$\text{Also, } \angle AOB = 60^\circ \left( \frac{360^\circ}{6} = 60^\circ \right)$$

and  $\angle OAB = \angle OBA = 60^\circ$  So,  $\Delta AOB$  is an equilateral triangle. Then,  $AB = 5 \text{ cm}$

So, Area,  $x = \text{Area of circle} - \text{Area of hexagon}$

$$= \pi r^2 - \frac{3\sqrt{3}(a)^2}{2}$$

$$= \frac{22}{7} \times (5)^2 - \frac{3\sqrt{3}(5)^2}{2} \quad [\because r = a = 5]$$

$$= 78.57 - 64.95 = 13.62 \text{ cm}^2$$

Hence, option A is correct.

6.

AB and CD are chords when produced meet externally at P.

$$\therefore AP \times BP = CP \times DP$$

Now, as  $AC \nparallel BD$  and  $\Delta PAC$  is not similar to  $\Delta PDB$ .

Hence, option D is correct.

7.

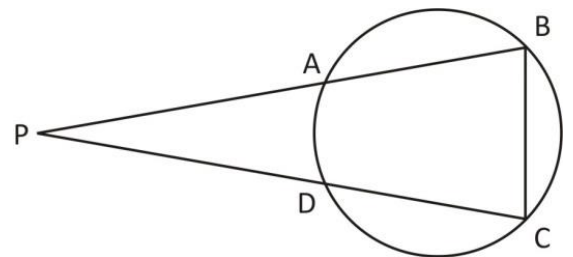
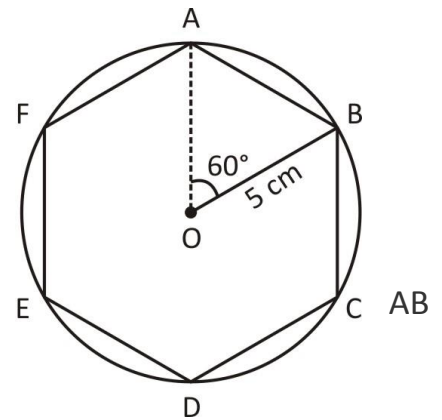
The perpendicular bisector of the chord of a circle always pass through the centre.

So, Statement I is wrong.

The angle in a semi-circle is a right angle.

So, Statement II is correct.

Hence, option B is correct.



8.

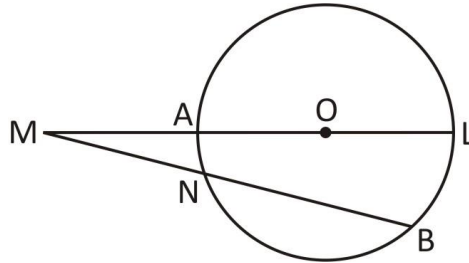
Since, secants  $\angle A$  and  $BN$  are intersecting at an exterior point  $M$ , then

$$LM \times AM = BM \times NM$$

$$\Rightarrow MA = MN < 1$$

MBLM

Hence, option D is correct.



9.

When two chords of a circle are intersect internally, then they are divided in proportion.

$$\text{i.e. } PX \cdot PY = PZ \cdot PT$$

In  $\Delta PXZ$  and  $\Delta PTY$ ,

$$\angle ZPX = \angle YPT$$

(Vertically opposite angles)

$$\angle PZX = \angle PYT$$

(angles in same segment)

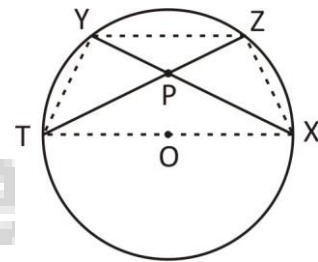
$$\angle PXZ = \angle PTY$$

(angles in same segment)

$$\Delta PXZ \sim \Delta PTY$$

Hence, the both statements are correct.

Hence, option C is correct.

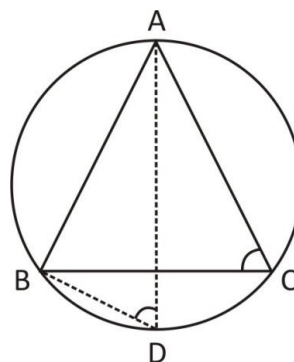


10.

$$\angle ADB = \angle ACB = 60^\circ$$

[  $\because$  angles in the same segment are equal ]

Hence, option B is correct.





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