Circles Questions for CDS, SSC & Railways Exams

Circle Quiz 4

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

1. Two circles touch each other externally. The distance between their centre is 7 cm. If the radius of one circle is 4 cm, then the radius of the other circle is

A. 3.5 cm B. 3 cm C. 4 cm D. 2 cm

2. A, B and C are the three points on a circle such that the angles subtended by the chords AB and AC at the centre O are 90° and 110° respectively. ∠BAC is equal to

A. 70° B. 80° C. 90° D. 100°

3. N is the foot of the perpendicular from a point P of a circle with radius 7 cm, on a diameter AB of the circle. If the length of the chord PB is 12 cm, the distance of the point N from the point B is

A. 65 cm B. 122 cm C. 35 cm D. 102 cm

4. A, B, C, D are four points on a circle. AC and BD intersect at a point E such that ∠BEC = 130° and ∠ECD = 20°, ∠BAC is

A. 120° B. 90° C. 100° D. 110°

5. If two concentric circles are of radii 5 cm and 3 cm, then the length of the chord of the larger circle which touches the smaller circle is

A. 6 cm B. 7 cm C. 10 cm D. 8 cm

6. A chord 12 cm long is drawn in a circle of diameter 20 cm. The distance of the chord from the centre is

A. 8 cm B. 6 cm C. 10 cm D. 16 cm

7. If the chord of a circle is equal to the radius of the circle, then the angle subtended by the chord at a point on the minor arc is

A. 150° B. 60° C. 120° D. 30°

8. The angle subtended by a chord at its centre is 60°, then the ratio between chord and radius is

A. 1 : 2 B. 1 : 1 C. √2 : 1 D. 2 : 1

9. Each of the circles of equal radii with centres A and B pass through the centre of one another circle they cut at C and D then ∠DBC is equal to

A. 60° B. 100° C. 120° D. 140°

10. 'O' is the centre of the circle, AB is a chord of the circle, OM ⊥ AB. If AB = 20 cm, OM = 2 ⊥ √11cm, then radius of the circle is

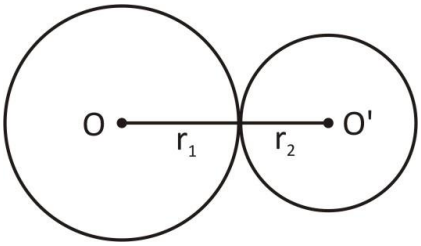
A. 15 cm B. 12 cm C. 10 cm D. 11 cm

Correct Answers:

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

Explanations:

1.



OO' = 7 cm

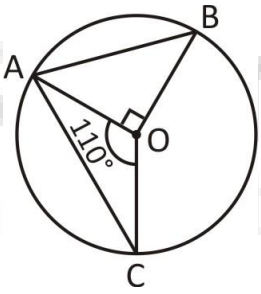
$r_1 + r_2 = 7$

$4 + r_2 = 7$

$r_2 = 7 – 4 = 3$ cm

Hence, option B is correct.

2.



We know that,

$\angle BOA + \angle AOC + \angle BOC = 360°$

$90° + 110° + \angle BOC = 360°$

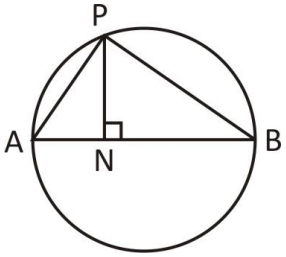
$\angle BOC = 360° – 200° = 160°$

Note : The angle subtended by an arc of a circle at the centre is double the angle subtended by it at any point on the remaining part of the circle.

$\therefore \angle BAC = \frac{1}{2}\angle BOC = \frac{1}{2} \times 160° = 80°$

Hence, option B is correct.

3.



Radius = 7 cm

Diameter, AB = 14 cm

PB = 12 cm

∠APB = 90° [∵ angle in the semi circle]

In ΔAPB, By pythagoras theorem

AP = $\sqrt{AB^2 - PB^2}$ = $\sqrt{14^2 - 12^2}$ = $\sqrt{52}$

Let, AN = x cm ⇒ NB = (14 – x) cm

In ΔAPN, By pythagoras theorem

PN2 = AP2 – AN2 = 52 – x2 ...(i)

Again, In ΔPNB, By pythagoras theorem

PN2 = PB2 – NB2 = 144 – (14 – x)2 ...(ii)

From Equation (i) and (ii),

52 – x2 = 144 – 196 + 28x – x2

28x = 104

x = $\frac{26}{7}$

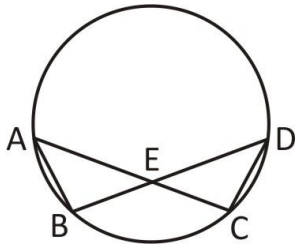
∴ NB = 14 – $\frac{26}{7}$ = $\frac{72}{7}$ = 10$\frac{2}{7}$ cm

Hence, option D is correct.

4.

We know that, Exterior angle is equal to the sum of two interior opposite angles.

∴ ∠BEC = ∠EDC + ∠ECD



130° = ∠EDC + 20°

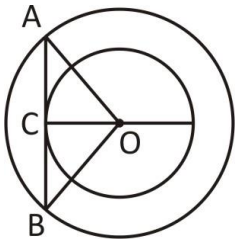
∠EDC = 110°

∴ ∠BAC = ∠EDC = 110°

[∵ Angles on the same arc]

Hence, option D is correct.

5.



OC = 3 cm and OA = 5 cm

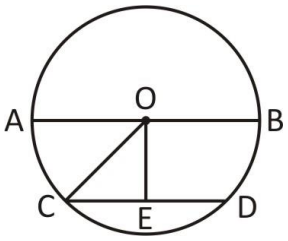
In ΔAOC, By pythagoras theorem,

AC = $\sqrt{OA^2 - OC^2}$ = $\sqrt{5^2 - 3^2}$ = 4 cm

∴ AB = 2 × AC = 2 × 4 = 8 cm

Hence, option D is correct.

6.



Diameter, AB = 20 cm

∴ Radius, AO = OC = 10 cm

Chord, CD = 12 cm

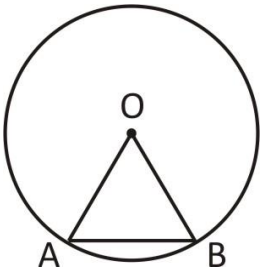
∴ CE = ED = 6 cm

In ΔCOE, By pythagoras theorem

OE = $\sqrt{OC^2 - CE^2}$ = $\sqrt{10^2 - 6^2}$ = 8 cm

Hence, option A is correct.

7.



If the chord of a circle is equal to the radius,

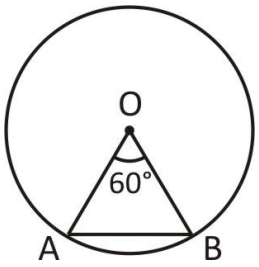
∴ OA = OB = AB

Now, ΔAOB is an equilateral triangle.

Hence ∠AOB = 60°

Hence, option B is correct.

8.



∠AOB = 60°

OA = OB = r (radii)

∴ ∠ABO = ∠OAB

In ΔAOB,

∠AOB + ∠OAB + ∠ABO = 180°

60° + 2∠OAB = 180° [∵ ∠OAB = ∠ABO]

2∠OAB = 180° – 60° = 120°

∠OAB = 60° = ∠ABO

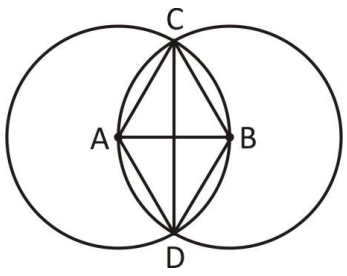
ΔAOB is an equilateral triangle.

∴ OA = OB = AB

∴ AB : OA = r : r = 1 : 1

Hence, option B is correct.

9.



In ΔABD,

AD = BD = AB = radius

∴ ΔABD is an equilateral triangle

∴ ∠ABC = 60°

In ΔABC

AC = BC = AB = radius

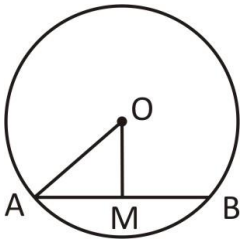
∴ ΔABC is an equilateral triangle

∴ ∠ABD = 60°

∴ ∠DBC = ∠ABC + ∠ABD = 60° + 60° = 120°

Hence, option C is correct.

10.



AB = 20 cm

∴ AM = MB = 10 cm

CM = 2 $\sqrt{11}$ cm

In ΔAOM, By pythagoras theorem

∴ Radius OA

$$= \sqrt{OM^2 + AM^2} = \sqrt{(2\sqrt{11})2 + 10^2)} = \sqrt{144} = 12 \text{ cm}$$

Hence, option B is correct.