Circle Questions for CDS, SSC & Railways Exams

Circle Quiz 5

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

1. In ΔABC, ∠ABC = 70°, ∠BCA = 40°. O is the point of intersection of the perpendicular bisectors of the sides, and then the angle ∠BOC is

A. 100° B. 120° C. 130° D. 140°

2. A, B, C are three points on the circumference of a circle and if AB = AC = 5 √2 cm and ∠BAC = 90°, find the radius.

A. 10 cm B. 5 cm C. 20 cm D. 15 cm

3. In the given figure, ∠ONY = 50° and ∠OMY = 15°. Then the value of the ∠MON is

A. 30° B. 40° C. 20° D. 70°

4. Two chords of lengths a metre and b metre subtend angles 60° and 90° at the centre of the circle respectively. Which of the following is true ?

A. b = √2a B. a = √2b C. a = 2b D. b = 2a

5. Two circles touch externally at P, QR is a common tangent of the circles touching the circles at Q and R. Then measure of ∠QPR is

A. 60° B. 30° C. 90° D.45°

6. Two circles intersect each other at the points A and B, A straight line parallel to AB intersects the circles at C, D, E and F. If CD = 4.5 cm, then the measure of EF is

A. 1.50 cm B. 2.25 cm C. 4.50 cm D. 9.00 cm

7. Two circles C1 and C2 touch each other internally at P. Two lines PCA and PDB meet the circles C1 in C, D and C2 in A, B respectively. If ∠BDC = 120°, then the value of ∠ABP is equal to

A. 60° B. 80° C. 100° D. 120°

8. Two circles having radii r units intersect each other in such a way that each of them passes through the centre of the other. Then the length of their common chord is

A. √2r units B. $\sqrt{3r}$ units C. √5r units D. r units

9. Chords AB and CD of a circle intersects externally at P. If AB = 18 cm, CD = 9 cm, and PD = 15 cm then the length of PB is

A. 22.07 B. 22.37 C. 21.07 D. 22.27

10. Length of two chords AB and AC of a circle are 12 cm and 5 cm and ∠BAC = 90°. Find the radius of the circle.

A. 14 B. 13 C. 16 D. 23

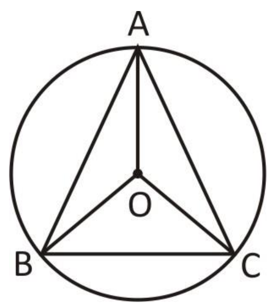
Correct Answers:

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

Explanations:

1.

OA = OB = OC = Circum-radius



In ΔABC, we know that

$\angle ABC + \angle BCA + \angle BAC = 180°$

$\angle BAC = 180° – 70° – 40° = 70°$

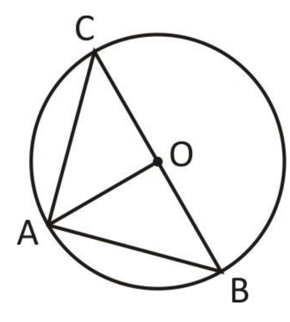
Note : The angle subtended by an arc of a circle at the centre is double the angle subtended by it at any point on the remaining part of the circle.

$\therefore$ $\angle BOC = 2 \times \angle BAC = 2 \times 70° = 140°$

Hence, option D is correct.

2.

$AB = AC = 5\sqrt{2}$ cm, $\angle BAC = 90°$



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.

$\therefore$ Exterior $\angle BOC = 2 \times \angle BAC = 2 \times 90° = 180°$

$\therefore$ $\angle BOC = 360° –$ Exterior $\angle BOC = 360° – 180° = 180°$

OA = OB = OC = r cm (radii)

AB = AC

$\therefore$ $\angle AOB = \angle AOC = 90°$

In ΔAOB, By pythagoras theorem

$AB^2 = OA^2 + OB^2$

$(5\sqrt{2})^2 = r^2 + r^2$

$50 = 2r^2$

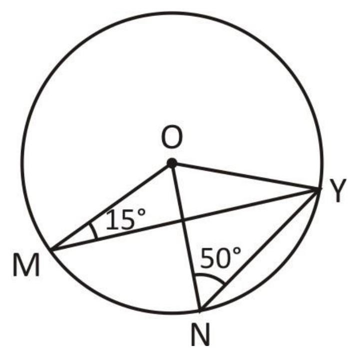
$r^2 = 25$

$r = 5$ cm

Hence, option B is correct.

3.

$\angle ONY = 50°$ and $\angle OMY = 15°$



In ΔONY,

$ON = OY$ (radii)

$\angle OYN = \angle ONY = 50°$

$\therefore\ \angle NOY = 180° - \angle ONY - \angle OYN = 180° - 50° - 50° = 80°$

In ΔOMY,

$OM = OY$ (radii)

$\angle OYM = \angle OMY = 15°$

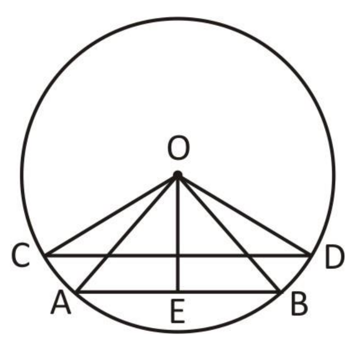
$\therefore\ \angle MOY = 180° - \angle OMY - \angle OYM = 180° - 15° - 15° = 150°$

$\therefore\ \angle MON = \angle MOY - \angle NOY = 150° - 80° = 70°$

Hence, option D is correct.

4.

$OA = OB = OC = OD = r$ units (radii)



$AB = a$ metre and $CD = b$ metre

$\angle AOB = 60°$ and $\angle COD = 90°$

In ΔCOD, By pythagoras theorem

$CD^2 = OC^2 + OD^2$

$b^2 = r^2 + r^2 = 2r^2$ ...(i)

In ΔAOB,

$OA = OB$

$\therefore \angle ABO = \angle OAB$

$\angle AOB + \angle ABO + \angle OAB = 180°$

$60° + \angle OAB + \angle OAB = 180°$

$2\angle OAB = 180° - 60° = 120°$

$\angle OAB = 60° = \angle ABO$

$\therefore \Delta AOB$ is an equilateral triangle.

$OA = OB = AB \Rightarrow a = r$

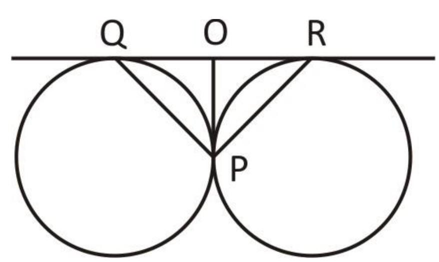
From equation (i),

$b = \sqrt{2}r$

$b = \sqrt{2}a$

Hence, option A is correct.

5.



$\angle POQ = \angle POR = 90°$

$OQ = OP = OR$

[$\because$ Tangent drawn from the same external point]

$\therefore \angle OQP = \angle OPQ = \angle ORP = \angle OPR$

In ΔPOQ, we know that

$\angle POQ + \angle OQP + \angle OPQ = 180°$

$90° + \angle OPQ + \angle OPQ = 180°$

$2\angle OPQ = 180° - 90° = 90°$

$\angle OPQ = 45°$

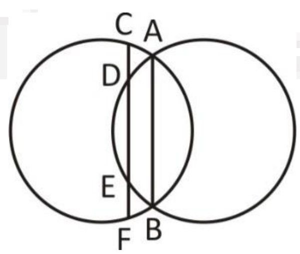
Similarly in ΔPOR, we get

$\angle ORP = 45°$

$\therefore\ \angle QPR = \angle OPQ + \angle ORP = 45° + 45° = 90°$

Hence, option C is correct.

6.

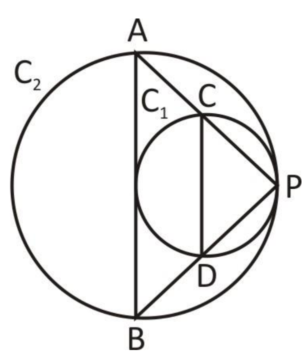


Clearly,

CD = EF = 4.5 cm

Hence, option C is correct.

7.



$\angle BDC = 120°$

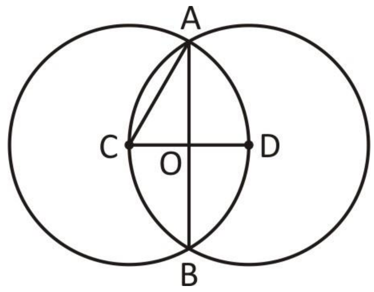
$\therefore\ \angle CDP = 180° - \angle BDC = 180° - 120° = 60°$

CD || AB

$\therefore\ \angle ABP = \angle CDP = 60°$

Hence, option A is correct.

8.



CD = AC = r units

$\therefore$ CO = OD = $\frac{r}{2}$ units

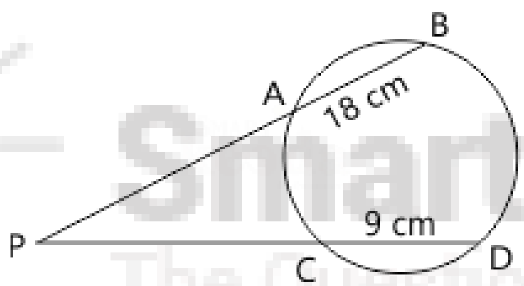
In ΔAOC,

OA = $\sqrt{AC^2 - OC^2}$ = $\sqrt{r^2 - \frac{r^2}{4}} = \sqrt{\frac{3r^2}{4}} = \frac{\sqrt{3}r}{2}$

$\therefore$ AB = 2 × OA = 2 × $\frac{\sqrt{3}r}{2}$ = $\sqrt{3}r$ units

Hence, option B is correct.

9.



PA × PB = PC ×PD

PA = PB –18

PC = PD – CD = 15 – 9 = 6 cm

So, (PB – 18)(PB) = 6 × 15

$PB^2 - 18$ PB = 6 ×15

$PB^2 - 18$ PB – 90 = 0

PB = $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

= $\frac{18 \pm \sqrt{324 - 4 \times 1 \times 40}}{2}$

= $\frac{18 \pm \sqrt{324 - 326}}{2}$

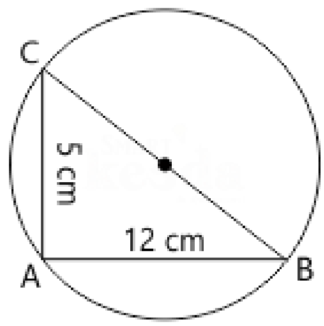
$= \dfrac{18 \pm 2\sqrt{171}}{2}$

$= 9 + \sqrt{171} = 9 + 13.07 = 22.07$

Hence, option A correct.

10.

As, BC is the diameter of circle,



by using Pythagoras theorem

BC $= \sqrt{CA^2 + AB^2}$

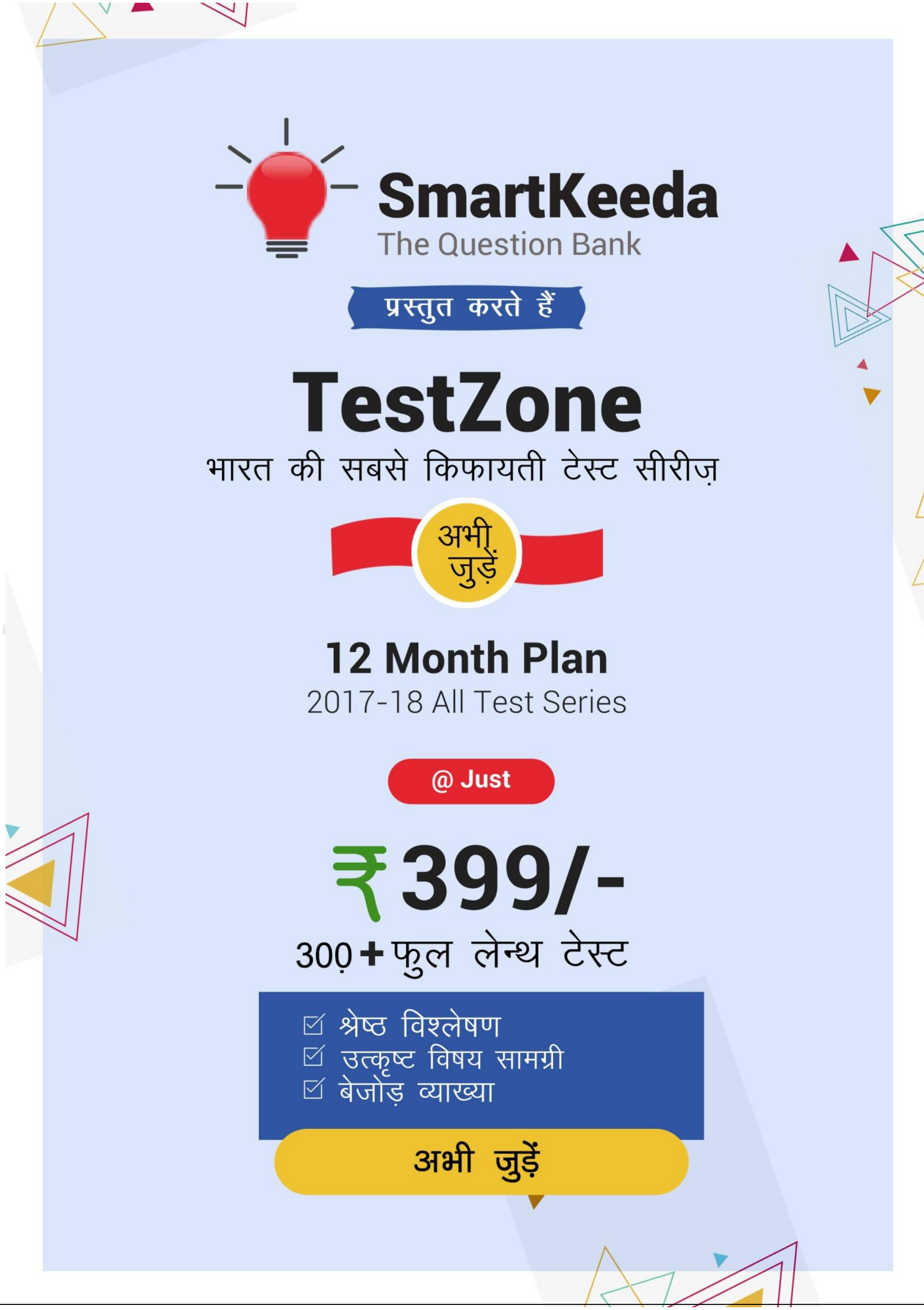
$= \sqrt{12^2 + 5^2}$

$= \sqrt{144 + 25}$

$= \sqrt{169}$

$= 13$

Hence, option B is correct.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