CHAPTERWISE QUESTION

CIRCLES

CLASS X **Time : 2 hrs.**

Mark : 60

SECTION - A OBJECTIVE TYPE **12 × 1 = 12**

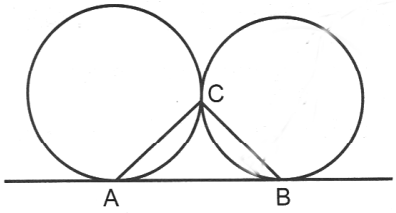
1. At point A on a diameter AB of a circle of radius 10 cm, tangent XAY is drawn to the circle. The length of the chord CD parallel to XY at a distance 16 cm from A is

   a) 8 cm b) 10 cm c) 16 cm d) 18 cm

2. Two circles touch each other externally at C and AB is common tangent of circles, then $\angle ACB$ is

   a) 70^0 b) 60^0

   c) 100^0 d) 90^0



3. The length of the tangent drawn from a point 8 cm away from the centre of a circle of radius 6 cm is

   a) 10 cm b) 5 cm c) $\sqrt{7}\ cm$ d) $2\sqrt{7}\ cm$

4. If radii of two concentric circles are 4 cm and 5 cm, then the length of each chord of one circle which is tangent to the other circle is

   a) 3 cm b) 6 cm c) 9 cm d) 1 cm

5. From a point X, the length of the tangent to a circle is 20 cm and the distance of X from the centre is 25 cm. The radius of the circle is

   a) 10 cm b) $5\sqrt{41}\ cm$ c) 15 cm d) 20 cm

6. If angle between two radii of a circle is 125^0, then the angle between the tangents at the ends of the radii is

   a) 90^0 b) 75^0 c) 55^0 d) 125^0

7. From a point P which is at a distance of 13 cm from the centre O of a circle of radius 5cm, a pair of tangents PQ and PR to the circle are drawn. Then the area of the quadrilateral PQOR is

   a) 60 cm^2 b) 65 cm^2 c) 30 cm^2 d) 32.5 cm^2

8. If two tangents inclined at an angle 60^0 are drawn to a circle of radius 3 cm, then length of each tangent is equal to

   a) $\frac{3}{2}\sqrt{3}\,cm$ b) 6 cm c) 3 cm d) $3\sqrt{3}\,cm$

9. The number of tangents that can be drawn to a circle from a point inside it is

   a) one b) two c) infinite d) none

10. Find the length of tangent drawn to a circle with radius 7 cm from a point 25 cm away from the centre.

    a) 24 cm b) 27 cm c) 26 cm d) 25 cm

11. A point P is 26 cm away from the centre of a circle and the length of the tangent drawn from P to the circle is 24 cm. Find the radius of the circle.

a) 11 cm b) 10 cm c) 16 cm d) 15 cm

12. If tangents PA and PB from a point P to a circle with centre O are inclined to each other at angle of 80^0, then $\angle POA$ is equal to

a) 60^0 b) 70^0 c) 80^0 d) 50^0

13. From a point P, 10 cm away from the centre of a circle, a tangent PT of length 8 cm is drawn. Find the radius of the circle.

a) 4 cm b) 7 cm c) 6 cm d) 5 cm

14. The common point of a tangent to a circle with the circle is called .....

a) centre b) point of contact c) end point d) none of these

In the following questions, a statement of Assertion (A) is followed by a statement of Reason (R). Mark the correct choice as :

a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A)

b) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A)

c) Assertion (A) is true but Reason (R) is false.

d) Assertion (A) is false but Reason (R) is true.

15. Assertion (A) : If in a cyclic quadrilateral, one angle is 40^0, then the opposite angle is 140^0.

Reason (R) : Sum of opposite angles in a cyclic quadrilateral is equal to 360^0.

16. Assertion (A) : If length of tangent from an external point to a circle is 8 cm, then the length of other tangent from the same point is 8 cm.

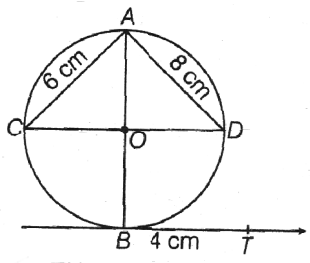
Reason (R) : Length of the tangents drawn from an external point to a circle are equal.

SECTION - B

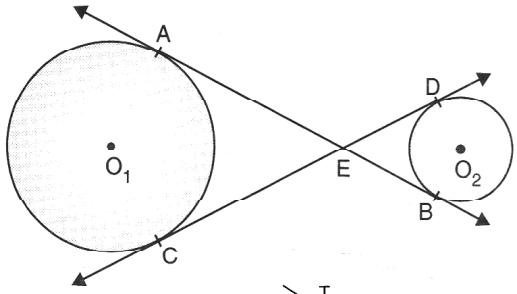
Short Answer I **5 × 2 = 10**

17. If PA and PB are two tangents drawn from a point P to a circle with centre O touching it at A and B, prove that OP is perpendicular bisector of AB.

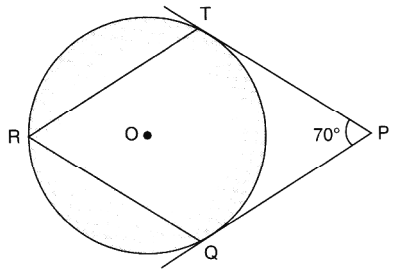
18. In the adjoining figure, AD = 8 cm, AC = 6 cm and TB is the tangent at B to the circle with centre O. Find OT, if BT is 4 cm.



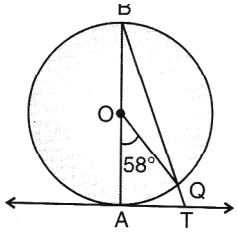
19. In figure, common tangents AB and CD to the two circles with centres O_1 and O_2 intersect at E. Prove that AB = CD.



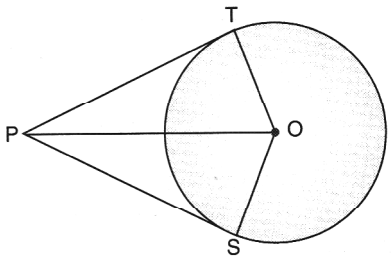
20. In figure, O is the centre of a circle. PT and PQ are tangents to the circle from an external point P. If $\angle TPQ = 70^0$, find $\angle TRQ$.



21. In given figure, AB is the diameter of a circle with center O and AT is a tangent. If $\angle AOQ = 58^0$, find $\angle ATQ$.



22. In the given figure, from a point P, two tangents PT and PS are drawn to a circle with centre O such that $\angle SPT = 120^0$. Prove that OP = 2PS.

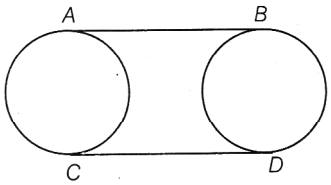


SECTION - C

Short Answer II **6 × 3 = 18**

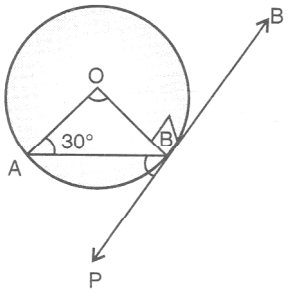
23. Two tangents PQ and PR are drawn from an external point to a circle with centre O. Prove that QORP is a cyclic quadrilateral.

24. In figure, AB and CD are common tangents to two circles of equal radii. Prove that AB = CD.



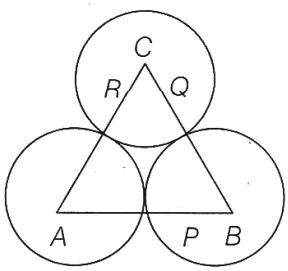
25. A chord PQ of a circle is parallel to the tangent drawn at a point R of the circle. Prove that R bisects the arc PRQ.

26. In the figure, PQ is a tangent to a circle with centre O. If $\angle OAB = 30^0$, find $\angle ABP$ and $\angle AOB$.



27. Prove that the tangents drawn at the ends of a diameter of a circle are parallel.

28. In the adjoining figure, three circles with centres, A, B and C, respectively touch each other externally. If AB = 5cm, BC = 7 cm and CA = 6 cm, then find the radius of the circle with centre A.

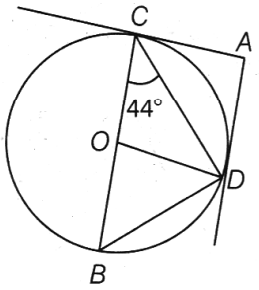


29. In ΔABC, AB = AC. If the interior circle of ΔABC touches the sides AB, BC and CA at D, E, F respectively. Prove that E bisects BC.

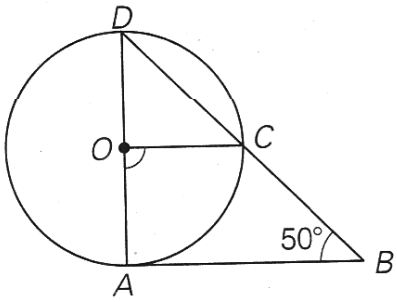
SECTION - D

Long Answer **4 × 5 = 20**

30. AC and AD are tangents at C and D, respectively. If $\angle BCD = 44^0$, then find $\angle CAD$, $\angle ADC$, $\angle CBD$ and $\angle ACD$.

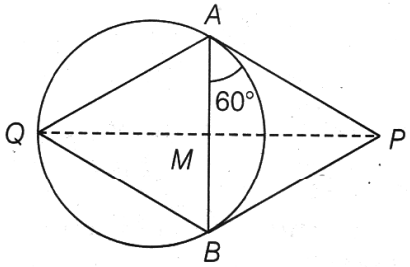


31. In the given figure, AD is a diameter of a circle with centre O and AB is a tangent at A. C is a point on the circle such that DC produced intersects the tangent at B and $\angle ABD = 50^0$. Find $\angle COA$.



32. Tangents PQ and PR are drawn to a circle such that $\angle RPQ = 30^0$. A chord RS is drawn parallel to the tangent PQ. Find $\angle RQS$.

33. PA and PB are the tangents to a circle which circumscribes an equilateral ΔABQ. If $\angle PAB = 60^0$, as shown in the figure, prove that QP bisects AB at right angle.



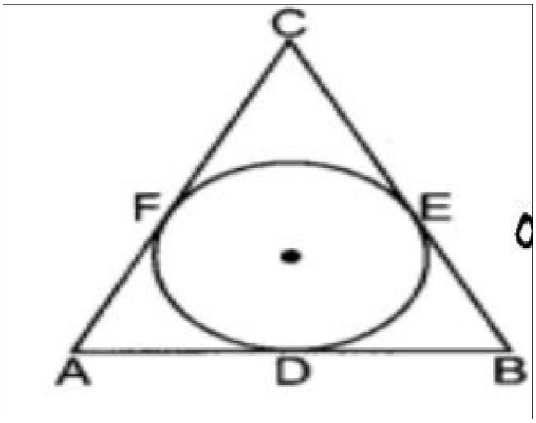
OR

In a right ΔABC in which $\angle B = 90^0$, a circle is drawn with AB as diameter intersecting the hypotenuse AC at P. Prove that the tangent to the circle at P bisects BC.

CASE STUDY

34. Read the text and answer the questions **5**

Varun has been selected by his School to design logo for Sports Day T-shirts for students and staff . The logo design is as given in the figure and he is working on the fonts and different colours according to the theme. In given figure, a circle with center O is inscribed in a ”ABC, such that it touches the sides AB, BC and CA at points D, E and F respectively. The lengths of sides AB, BC and CA are 12 cm, 8 cm and 10 cm respectively.



i. Find the length of AD

ii. Find the Length of BE

iii. Find the length of CF

iv. If radius of the circle is 4cm, Find the area of $\triangle$ OAB

v. Find area of $\triangle$ ABC