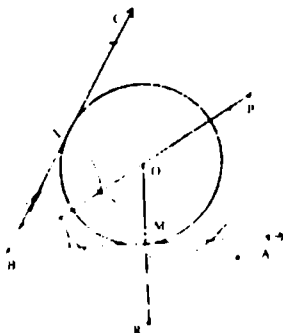ii) 60°

Steps of Construction:

i) Draw an angle ∠ABC of 60°.

(ii) Draw $\overline{BP}$ bisector of angle ∠ABC.

(iii) Take any point O on $\overrightarrow{BP}$.

(iv) Drop $\overline{OM} \perp \overline{BA}$.

(v) Take O as centre and draw a circle with radius m$\overline{OM}$.

This circle touches arm $\overline{BC}$ at N also.

SOLVED MISCELLANEOUS EXERCISE - 13

Q1. Multiple Choice Questions:

Three possible answers are given for the following questions. Tick (✓) the correct answer.

(i) The circumference of a circle is called
   (a) chord   (b) segment   (c) boundary

(ii) A line intersecting a circle is called:
   (a) tangeht   (b) secant   (c) chord

(iii) The portion of a circle between two radii and an arc is called
   (a) sector   (b) segment   (c) chord

(iv) Angle inscribed in a semi-circle is
   (a) $\dfrac{\pi}{2}$ (b) $\dfrac{\pi}{3}$ (c) $\dfrac{\pi}{4}$

(v) The length of the diameter of a circle is how many times the radius of the circle
   (a) 1   (b) 2   (c) 3

(vi) The tangent and radius of a circle at the point of contact are
   (a) parallel   (b) not perpendicular(c)perpendicular

(vii) Circles having three points in common:
   (a) over lapping   (b) collinear   (c) not coincide

(viii) If two circles touch each other, their centres and point of contact are

(a) coincident   (b) non-collinear   (c) collinear

(ix) **The measure of the external angle of a regular hexagon is**

   (a) $\dfrac{\pi}{8}$ (b) $\dfrac{\pi}{6}$ (c) $\dfrac{\pi}{8}$

(x) **If the in centre and circumventer of a triangle coincide, the triangle is**
   (a) an isoscenes   (b) a right triangle (c) an equilateral

(xi) **The measure of the external angle of a regular octagon is**

   (a) $\dfrac{\pi}{4}$ (b) $\dfrac{\pi}{6}$ (c) $\dfrac{\pi}{8}$

(xii) **Tangents drawn at the end points of the diameter of a circle are**
   (a) parallel   (b) perpendicular   (c) Intersecting

(xiii) **The lengths of two transverse tangents to a pair of circles are**
   (a) unequal   (b) equal   (c) overlapping

(xiv) **How many tangents can be drawn from a point outside the circle?**
   (a) 1   (b) 2   (c) 3

(xv) **If the distance between the centres of two circles is equal to the sum of their radii, then the circles will:**
   (a) Intersect   (b) do not intersect (c) touch each other externally

(xvi) **If the two circles touches externally, then the distance between their centres is equal to the**
   (a) difference of their radii
   (b) sum of their radii
   (c) product of their radii

(xvii) **How many common tangents can be drawn for two touching circles?**
   (a) 2   (b) 3   (c) 4

(xviii) **How many common tangents can be drawn for two disjoint circles?**
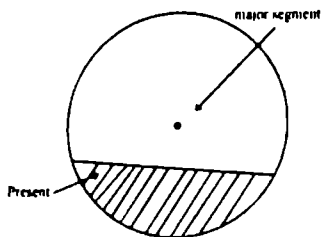   (a) 2   (b) 3   (c) 4

Answer:

1	c	2	b	3.	a	4	a	5	b
6	c	7	a	8	c	9	a	10	c
11	a	12	a	13	b	14	b	15	c
16	b	17	b	18	c				

Q2. Write short answers of the following questions:

(i) Define and draw the following geometric figures:
   (a) The segment of a circle.   (b) The tangent to a circle.
   (c) The sector of a circle.   (d) The inscribed circle.
   (e) The circumscribed circle,   (f) The described circle;
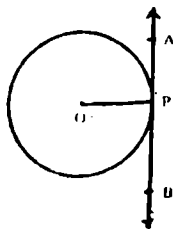
(a) The segment of a circle

The area contained between a chord and the arc which it cuts off is called a segment of the circle.
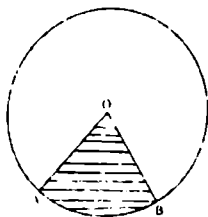
(b) The tangent to a circle.

A line that touch a circle is called its tangent. $\overline{APB}$ is tangent to the circle with centre O at point P.
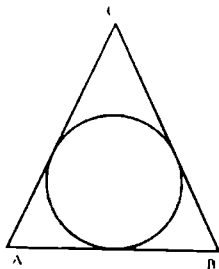
(c) The sector of a circle.

The area contained between two radii and the arc of the circle which they intercept, is called a sector of the circle.
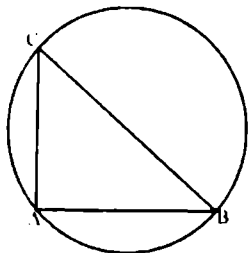
(d) The inscribed circle.

The sides of triangle touch a circle internally, such a circle is called inscribed circle of the triangle.
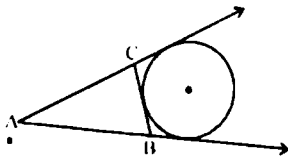
(e) The circumscribed circle,

A circle that passes through the vertices of a triangle is called circumscribed circle of the triangle.

(f) The described circle;

A circle that touches two sides of a triangle internally and one side externally is called an described circle.

(ii) The length of each side of a regular octagon is 3 cm. Measure its perimeter.

Length of side = 3 cm

Number of sides of an octagon = 8

Perimeter = 3 × 8 = 24 cm

(iii) **Write down the formula for finding the angle subtended by the r.ide of a n-sided polygon at the centre of the circle.**

Ans.

$$\frac{360°}{n}$$

(iv) **The length of the side of a regular pentagon is 5 cm what is its perireeter?**

Solution

Length of each side = 5 cm
Number of sides = 5
Perimeter = 5 × 5 = 25 cm

Q3. Fill in the blanks:

1) The boundary of a circle is called_____.

2) The circumference of a circle is called _____ of the circle.

3) The line joining the two points of circle is called_____.

4) The point of intersection of perpendicular bisectors of two non-parallel chords of a circle is called the_____.

5) Circles having three points in common will_____.

6) The distance of a point inside the circle from its centre is_____ than the radius.

7) The distance of a point outside the circle from its centre is_____ than the radius,

8) A circle has only _____ centre.

9) One and only one circle can be drawn through three _____ points.

10) Angle inscribed in a semi-circle is a _____ angle.   •

11) If two circles touch each other, the point of _____ and their _____ are collinear.

12) If two circles touch each other, their point of contact and centres are_____.

13) From a point outside the circle _____ tangents can be drawn.

14) A tangent is _____ to the radius of a circle at its point of contact.

15) The straight line drawn ⊥ to the radius of a circle is called the_____ to the circle.

16) Two circles cannot cut each other at more than _____ points.

17) The ⊥ bisector of a chord of a circle passes through the _____.

18) The length of two direct common tangents to two circles are_____ to each other.

19) The length of two transverse common tangents to two circles are _____ to each other.

20) If the in-centre and circum-centre of a triangle coincide the triangle is _____.

21) Two intersecting circles are not_____.

22) The centre of an inscribed circle is called_____.

23) The centre of a circumscribed circle is called_____.

24) The radius of an inscribed circle is called _____.

25) The radius of a circumscribed circle is called _____.

Answer:

1	Circumference	2	Boundary	3	Chord	4	Centre	5	Coincide
6	Less	7	Greater	8	One	9	Non-collinear	10	Right
11	Contact, centers	12	Collinear	13	Two	14	Centre	15	Equal
16	Equal	20	Equilateral	21	Concenric	22	In centre	23	Circumventer
24	In-radius	25	Circum-radius.							

SUMMARY

✓ A Girele of any radius can be traced by rotating a compass about fixed point.

✓ The perpendicular bisectors of two non-parallel chords of a circle intersect at a point which is known as centre of circle.

✓ A circle can be drawn through given three non-collinear points.

✓ When a part of circumference of a circle is given, the circle can be completed.

✓ If a triangle, the circumscribed circle, inscribed circle and escribed circle opposite to each vertex can be constructed.

✓ If a circle is given, then the circumscribed and inscribed equilateral triangles can be constructed.

✓ For a given circle, the circumscribed and inscribed squares can be drawn.

✓ For a given circle, the circumscribed and inscribed regular hexagon can be constructed.

✓ We can draw tangents to a given are as its midpoint, its any end point, and a point not on the arc.

✓ Tangents can be drawn, to a given circle;, when a point is an its circumference and from a point outside the circle.

✓ Tangents to two unequal touching circles can be traced.

✓ Direct or transverse common tangents of two equal circles or two unequal circles can be drawn.

✓ We can construct a circle touching the arms of a given angle.

✓ A circle passing through a graven point between two converging lines and touching each of them, can be traced.