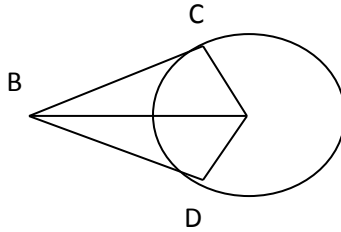




**SECTION – B (2 marks)**

9. If the roots of the equation  $(a-b)x^2 + (b-c)x + (c-a) = 0$  are equal, Prove that  $b+c = 2a$ .
10. For what value of P are  $(2P+1), 13, (5P-3)$  three consecutive terms of an A.P.
11. Two tangent segments BC and BD are drawn to a circle with centre O such that  $\angle CBD = 120^\circ$ . Prove that  $OB = 2 BC$ .



12. A quadrilateral ABCD is drawn to circumscribe a circle, Prove that  $AB + CD = AD + BC$ .
13. Find the distance between the points  $(5 \sin 60^\circ, 0)$  and  $(0, 5 \sin 30^\circ)$ .
14. If tangents AB and AC from a point A to a circle with centre O are inclined to each other at an angle of  $70^\circ$ , then Find  $\angle AOB$ .

**SECTION – C (3 marks)**

15. Find two consecutive positive integers, the sum of whose squares is 25.

OR

Solve for x, 
$$\frac{1}{a+b+x} = \frac{1}{a} + \frac{1}{b} + \frac{1}{x}$$

16. If 10 times the 10<sup>th</sup> term of an A.P is equal to 15 times the 15<sup>th</sup> term, show that its 25<sup>th</sup> term is zero.
- (i) What is the relation between a and d.
- (ii) Prateek declares that 25<sup>th</sup> term of the A.P is non zero, do you agree? Which value of Prateek is depicted by his declaration.
17. A 1.5 m tall boy stands at a distance of 3m from a lamp post and cast a shadow of 4.5 m on the ground. Find the height of the lamp post.
18. The curved surface area of a cylindrical pillar is  $264 \text{ m}^2$  and its volume is  $924 \text{ m}^3$ , Find the height of the pillar.
19. A person on tour has Rs.360 for his expenses. If he extends his tour for 4 days, he has to cut down his daily expenses by Rs.3. Find the original duration of the tour.
20. Draw a circle of radius 4.2cm. Draw a pair of tangents to this circle inclined to each other at an angle  $50^\circ$ .
21. For what value of P for which the points  $(-5, 1), (1, P)$  and  $(4, -2)$  collinear.
- OR
- The line segment joining the points  $A(3,2), B(5,1)$  is divided at the point P in the ratio of 1:2 and P lies on the line  $3x - 18y + k = 0$ , Find the value of k?
22. A bag contains 6 red balls and some blue balls. If the probability of drawing blue ball from the bag is twice the probability of drawing a red ball, Find the no. of blue balls.

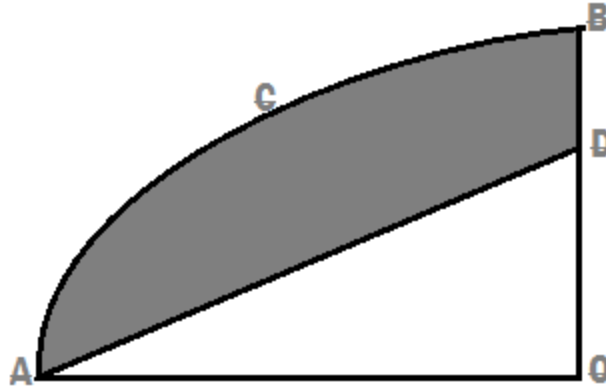
23. If the radii of the ends of a buckets are 5cm and 15 cm and 24cm high , Find its surface area. ( $\pi = 3.14$ )

24. OACB in a quadrilateral of a circle with centre O and its radius 3.5 cm . If OD = 2 cm , find the area of

(1) Quadrant OACB

(2) Shaded region.

( $\pi = 22/7$ )



**SECTION – D (4 marks)**

25. The sum of the area of two squares is  $640 \text{ m}^2$  . If the difference in their perimeter is 64 m , Find the sides of the two squares.

26. Find the sum of first 25 items of an A.P whose  $n^{\text{th}}$  term is given by  $a_n = 7 - 3n$ .

27. Prove that the tangents drawn from an external point of a circle are equal.

28. The angle of elevation of a jet fighter from a point A on the ground is  $60^\circ$  . After a flight of 15 seconds, the angle of elevation changes to  $30^\circ$  . If the jet is flying at a constant height of  $1500\sqrt{3}\text{m}$  find

- (i) The horizontal distance between the two positions of the jet plane .
- (ii) The speed of the jet plane in km/h
- (iii) Hari guesses that the speed of the jet plane is 720km/h ,how do you appreciate his guess , What is the value you have learnt from his guess ?

29. A sphere of diameter 6 cm is dropped in a right circular cylindrical vessel, partly filled with water. The diameter of the cylindrical vessel is 12 cm. If the sphere is completely submerged in water, by how much will the level of water rise in the cylindrical vessel.

30. In what ratio in the line segment joining the points A (-6,3) and B (-2,-5) divided by the y axis . Also find the co-ordinates of the point of division.

31. A bag contains 11 ,12,13,14 .....30 tickets. A ticket is taken out from the bag at random. Find the probability that number on the drawn ticket is

- (a) Multiple of 7
- (b) Greater than 15 and a multiple of 5.

32. The area of an equilateral triangle is  $49\sqrt{3} \text{ cm}^2$  . Taking each angular point as centre , circles are drawn with radius equal to half the length of the side of the triangle. Find the area of the triangle not included in the circles. ( $\sqrt{3} = 1.73$  ,  $\pi = 22/7$ )

33. A toy is the form of a cone mounted on a hemisphere of common base radius 7 cm. The total height of the toy is 31 cm ,
- (i) Find the slant height of the conical part.
  - (ii) Write the formulas used in this solution.
  - (iii) Find the total surface area of the toy.
  - (iv) David says that the height of the conical portion is an even number, is he true? Which value is seen by his statement?

34. A circle touches the sides BC of a  $\triangle ABC$  at P and touches AB and AC produced at Q and R as shown in the figure, Show that  $AQ = \frac{1}{2} \times$  perimeter of  $\triangle ABC$ .

