Name: ..... Branch: ..... MAX. MARKS: 80

Sec: .....

General instructions:

1. *All questions are **compulsory**.*
2. *This question paper consists of **30** questions divided into four section – A, B, C and D.*
3. *Section A contains **6** questions of **1** mark each. Section **B** contains **6** questions of 2 marks each. Section C contains 10 questions of 3 marks each. Section D contains **8** questions of **4** marks each.*
4. *There is no overall choice. However an internal choice has been provided in **4** questions of **3** marks each and **3** questions of **4** marks each. You have to attempt only **one** of the alternatives in all such questions.*
5. *Read the questions carefully before attempting.*
6. *Draw a line after every problem and present the paper neatly and stepwise.*
7. *Highlight the formulae everywhere in the sum.*
8. *Use of calculator is **not** permitted.*

SECTION – A

I. Each carries 1 mark: **6 × 1 = 6M**

1. Find the nature of the roots $6x^2 + 5x - 6 = 0$
2. For what value of 'p' if 2p, p+10 and 3p+2 are in A.P?
3. $\Delta ABC \sim \Delta DEF$ and their areas be, respectively $64cm^2$ and $121cm^2$. If EF = 15.4cm, find BC. 2M

$$\frac{64}{121} = \left(\frac{BC}{EF}\right)^2 \Rightarrow \frac{8}{11} = \frac{BC}{15.4} \quad BC = 11.2$$

4. Find the Co-ordinates of a point A, where AB is the diameter of a circle whose centre is (2, -3) and B is (1, 4)
5. Find the length of the tangents drawn from the point, whose distance from the centre of a circle is 25cm and radius of the circle is 7cm.
6. Find the area of a sector of a circle of radius 28cm and central angle 45^0

SECTION – B

II. Each carries 2 marks: **6 × 2 = 12M**

7. Find the point on the x – axis which is equidistant from (2, –5) and (–2, 9).
8. Determine 'K', if the points (K, 5) (2, 3) and (–2, –11) are collinear.
9. ABC is an Isosceles triangle right angled at C. Prove that $AB^2 = 2AC^2$
10. Which term of the AP 21, 18, 15, ... is –81? Is any term having zero? Justify.
11. Find the 20th term from the last term of the AP 3, 8, 13, ..., 253.
12. The altitude of a right triangle is 7cm less than its base. If the hypotenuse is 13cm, find the other two sides.

SECTION – C

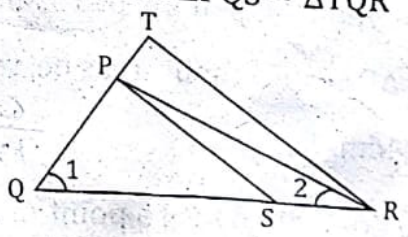
III. Each carries 3marks: **10 × 3 = 30**

13. A motor boat whose speed is 18 km/h in still water takes 1hour more to go 24km upstream than to return downstream to the same spot. Find the speed of the stream.
14. How many terms of the AP 9, 17, 25..... must be taken to give a sum of 636?

(Or)

If the sum of first 7 terms of an AP is 49 and that of 17 terms is 289, find the sum of first n terms.

15. In the adjacent figure, $\frac{QR}{QS} = \frac{QT}{PR}$ and $\angle 1 = \angle 2$ show that $\Delta PQS \sim \Delta TQR$



16. In ΔABC, $\angle C = 90^0$ and $CD \perp AB$ prove that $\frac{BC^2}{AC^2} = \frac{BD}{AD}$

(Or)

ΔABC is an obtuse angled triangle in which $\angle ABC > 90^0$ and $AD \perp CB$ produced. Prove that $AC^2 = AB^2 + BC^2 + 2\,BC.BD$

17. If $(1, 2)$, $(4, y)$, $(x, 6)$ and $(3, 5)$ are the vertices of a parallelogram taken in order, find x and y

18. Prove the length of tangents drawn from an external point to a circle are equal.

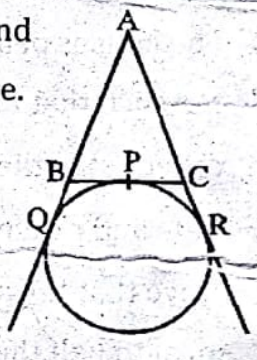
19. Draw a pair of tangents to a circle of radius 5cm which are inclined to each other at an angle of 60^0

20. Prove that the parallelogram circumscribing a circle is a rhombus.

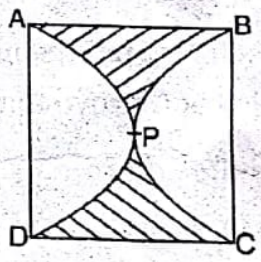
(Or)

A circle touches the side BC of a ΔABC at P and touches AB and AC when produced at Q and R respectively as shown in figure.

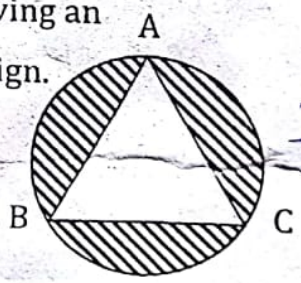
Show that AQ = $\frac{1}{2}$ (perimeter of ΔABC)



21. Find the area of the shaded region, if ABCD is a square of side 25cm and APD and BPC are semicircles.

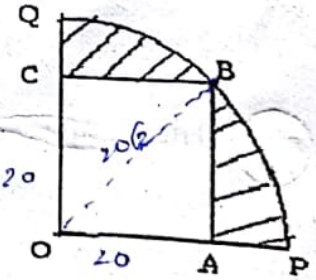


22. In a circular table cover of radius 32cm, a design is formed leaving an equilateral triangle ABC in the middle. Find the area of the design.



(Or)

A square OABC is inscribed in a quadrant OPBQ, If OA = 20cm, find the area of the shaded region



SECTION – D

IV. Each carries 4marks:

23. Two water taps together can fill a tank in $9\frac{3}{8}$ hours. The tap of la... taken 10 hours less than the smaller one to fill the tank separately. F... ...ne time in which each tap can separately fill the tank.

(Or)

The sum of the areas of two squares is 468m² If the difference of their perimeters is 24m. find the sides of the two squares.

24. The houses of a row and numbered consecutively from 1 to 49. There is a value of x such that the sum of the numbers of the houses preceding the house numbered x is equal to the sum of the numbers of the houses following it. Find the value of x.

25. State and prove Thales theorem. BPT.

26. Prove that the area of an equilateral triangle described on one side of a square is equal to half the area of the equilateral triangle described on one of its diagonals.

(Or)

D and E are points on the sides CA and CB respectively of a triangle ABC right angled at C prove that $AE^2 + BD^2 = AB^2 + DE^2$

27. Find the Co-ordinates of the points of trisection of the line segment joining (4, –1) and (–2, –3).

28. Find the area of quadrilateral ABCD formed by the vertices.
A(–5, 7), B(–4, –5), C(–1, –6), D(4, 5).

(Or)

Determine the ratio in which the line $2x + y - 4 = 0$ divides the line segment joining the points A(2, –2) B(3, 7).

29. Construct a triangle with sides 5cm, 6cm and 7cm and then other triangle whose sides are $\frac{7}{5}$ of the corresponding sides of the first triangle.

30. The diameters of front and rear wheels of a tractor are 80cm and 2m respectively. Find the number of revolution that rear wheel will make in covering a distance in which the front wheel makes 1400 revolutions.