**Section – A**

**1. A number is selected from numbers 1 to 25. The probability that it is prime is:**

(a) 5/6      (b) 1/3      (c) 1/6      (d) 2/3

**2. If the angle of elevation of the top of a tower from two points distance a and b from the base and in the same straight line with at are complementary, then the height of the tower is:**

(a) a/b      (b) ab      (c) $\sqrt{ab}$      (d) $\sqrt{a}/b$

**3. The perimeter of a triangle is 30 cm and the circumference of its in circle is 88 cm. Then area of triangle is:**

(a) 420 cm$^2$ (b) 140 cm$^2$ (c) 70 cm$^2$ (d) 210 cm$^2$

**4. If the first term of an A.P. is 2 and common difference is 4, then the sum of its 40 terms is:**

(a) 2800      (b) 16000      (c) 3200      (d)

**5. The surface area of a sphere is same as the curved surface of right circular cylinder whose height and diameter are 12 cm each. The radius of the sphere is:**

(a) 12 cm      (b) 4 cm      (c) 3 cm      (d) 6 cm

**6. If the circumference and the area of a circle are numerically equal, then diameter of the circle is:**

(a) π/2      (b) 2π      (c) 2      (d) 4

**7. AB and CD are two common tangents to circles which touch each other at C. If D lies on AB such that CD = 4 cm, then AB is equal to:**

(a) 12cm      (b) 6 cm      (c) 4 cm      (d) 8cm

**8. A tangent PQ at a point P of circle of radius 5 cm meets a line through the centre O at a point Q such that OQ = 12 cm. Length PQ is:**

(a) 13 cm      (b) 8.5 cm      (c) $\sqrt{119}$      (d) 12 cm

**9. If three coins are tossed simultaneously, then the probability of getting at least two heads, is:**

(a) ¼      (b) ½      (c) 2/4      (d) 3/8

**10. The area of in circle of an equilateral triangle is 154 cm$^2$ .The perimeter of the triangle is:**

(a) 72.7 cm      (b) 72.3 cm      (c) 71.5 cm      (d) 71.7 cm

**Section – B**

**11. Prove that the tangents drawn at the ends of a diameter of a circle are paralled.**

**12. A bag contains 7 white, 4 red and 9 black balls. A ball is drawn at the random. What is the probability that ball drawn is not white?**

**13. Shoe that the points (7, 10), (-2, 5) and (3, -4) are the vertices of an isosceles right triangle.**

**14. Using the quadratic formula, solve the equation:**

$A^2b^2x^2 - (4b^4 - 3a^4) x - 12a^2b^2 = 0$

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

**16.** Find the radius of circle whose area is equal to the sum of the areas of three circles whose radii are 3 cm, 4 cm and 12cm.

**17.** The line segment joining the points (3, -4) and (1, 2) is trisected at the points P and Q.

If the coordinates of P and Q are (p, -2) and (5/3, q) respectively, find the values of p and q.

**18.** Find the area of a circular ring whose external and internal diameters are 20 cm and 6 cm.

**Section – C**

**19.** If m times the m$^{th}$ tern of an A.P. is equal to n times its n$^{th}$ term, find $(m + n)^{th}$ term of A.P.?

**20.** Two tangents TP and TQ are drawn from an external point T to a circle with centre O. As shown in fig. or if they are inclined to each other at an angle of 100$^0$ then what is the value of ∟POQ?

**21.** From the top of house, h meters high from the ground, the angle of elevation and depression of the top and bottom of a tower on the other side of the street are θ and φ, respectively. Prove that the height of the tower h (1+ tan θ cot θ).

**22.** A motor boat whose speed is 8cm/hour in still water goes 15 km down stream and comes back in a total time of 3 hours 40 minutes. Find the speed of the stream.

**23.** For what value of n are the nth terms of two A.P. is 63, 65, 67 ……… and 3, 10, 17……… equal?

**24.** Construct a triangle ABC in which AB = 5 cm, ∟B = 60$^0$ and BC = 5.5 cm. Also construct a triangle ABC similar to triangle ABC, whose each side is 3/2 times the corresponding side of the triangle ABC.

**25.** A bag contains 5 white balls, 7 red balls, 4 black balls and 2blue balls. One ball is drawn at random from the bag. What is the probability that the ball drawn is:

**(a)** Not white

**(b)** Red or black

**(c)** White or blue

**(d)** Neither white not black

**26.** PQRS is a square land of the side 28 m. Two semicircular grass covered portions are to be made on two of its opposite sides as shown in the figure. How much area will be left uncovered? [Take π = 22/7]

**27.** A solid composed of a cylinder with hemispherical ends. If the whole length of the solid is 104 cm and radius of each hemispherical end is 7cm, find the cost of polishing its surface at the rate of Rs.10 per dm$^2$

**28.** If A (4,-8), B (3, 6) and C (5, -4) are the vertices of triangle ABC, D is the mid point of BC and P is a point on adjoined such that AP/PD = 2. Find the coordinate of P.

**Section – D**

**29. Solve for x:**

$$X^4 + 2x^3 + 13x^2 + 2x + 1 = 0.$$

**30. The angles of depression of the top and bottom of an 8 m tall building from the top of a multistoreyed building are $30^0$ and $45^0$ respectively. Find the height of the multi storeyed building and the distance between the two buildings.**

**31. Solve for x:**

$$2 (x^2 + 1/x^2) - (x + 1/x) - 11 = 0$$

**32. A class consists of a number of boys whose ages are in A.P., the common difference being 4 months. If they youngest boy is just eight years old and if sum of the ages is 168 years. Find the number of boys in the class.**

**33. Construct a triangle with sides 5 cm, 6 cm and 7 cm and then another triangle whose sides are 7/5 of the corresponding sides of first triangle.**

**34. A car has to wipers which do not over lap each wiper has a blade of length 25 cm sweeping through an angle $115^0$ . Find the total area cleared at each sweep of the blades.**