**Section – A**

**1. If the centroid of the triangle formed by (7, x), (y, -6) and (9, 10) is at (6, 3), then**

**(x, y) is:**

(a) 4 cm                      (b) 3 cm                      (c) √3 cm                      (d) 2 cm

**2. If the sum of n terms of an A.P. be 3n2 + n and its common difference is 6, then its first term is:**

(a) 1                      (b) 4                      (c) 3                      (d) 2

**3. PQ is a tangent drawn from a point P to a circle with centre O and QOR is a diameter of the circle such that $\llcorner$POR = $120^0$ then $\llcorner$OPQ is:**

(a) $30^0$ (b) $45^0$ (c) $90^0$ (d) $60^0$

**4. In a single throw of a pair of dice the probability of getting the sum a perfect square is:**

(a) 1/6                      (b) 7/36                      (c) 1/18                      (d) 2/9

**5. If the centroid of the triangle formed by (7, x), (y, -6) and (9, 10) is at (6, 3), then (x, y) is:**

(a) (5, 4)                      (b) (5, 2)                      (c) (-5, -2)                      (d) (4, 5)

**6. The circumference of a circle is 100 cm. The side of a square inscribed in the circle is:**

(a) 100√2/п cm                      (b) 100/п cm                      (c) 50 √2/п cm                      (d) 50 √2 cm

**7. If $ax^2 + bx + c = 0$ has equal roots, then**

(a) $-b^2/2a$                      (b) b/2a                      (c) $-b/2a$                      (d) $- b^2/4a$

**8. The volume of the greatest sphere that can be cut be cut off from a cylinder big of wood base radius 1 m and height 5 cm is:**

(a) 10/3 п                      (b) 5 п                      (c) 20/3 п                      (d) 4/3 п

**9. Which of the following can not be probability of an event?**

(a) 9/4 cm                      (b) 4/9 cm                      (c) 9/2 cm                      (d) 2/9 cm

**10. The distance between two parallel tangents of a circle of radius 4 cm:**

(a) 4 cm                      (b) 3 cm                      (c) 2 cm                      (d) 1 cm

**Section – B**

**11. A cylinder, cone and a hemisphere of equal base have the same height. What is their ratio in their volumes?**

**12. For what value of P, are the points (2, 1) (P,-1) and (-1, 3) collinear.**

**13. A letter is chosen at random from the word 'MATHEMATICS'. Find the probability of choosing letter A.**

**14. Find the sum of all 3 – digit natural numbers which are divisible by 13.**

**15. Solve for x:**

$X^2 + x - (a + 2)(a + 1) = 0$

**16. For what value of n is the nth term of the following two APs the same:**

**(a) 69, 68, 67, .....**

**(b) 1, 7, 13, 19, .....**

**17. Triangle ABC is an isosceles triangle in which AB = AC circumscribed about a circle Show that BC is bisected at the point of contact.**

**18. What is the ratio of the areas of a circle and equilateral triangle whose diameter and a side are respectively equal.**

**Section – C**

**19. Draw a triangle ABC with sides BC= 6 cm, AB =5 cm and $\angle ABC = 60^0$. Then construct a triangle whose sides are ¾ of the corresponding sides of triangle ABC.**

**20. The perimeter of an isosceles triangle is 32 cm. If each equal side is 5/6 times the base. Find the area of the triangle.**

**21. Two circle touch internally at a point P and from a point T on the common tangent at P. Tangent segment TQ,TR are drawn to the circles. Prove that TQ = TR**

**22. The sum of 5th and 9th term of an A.P. is 72 and the sum of 7th and 12th terms is 97. Find the A.P.**

**23. The vertices of a triangle are (-1, 3) ; and (5, 1) Find the length of medians through vertices (-1, 3) and (5, 1).**

**24. A motor boat whose speed is 15 km/h in still water goes 30 km downstream and comes back in a total time of 4 hours 30 minutes. Find the speed of the stream.**

**25. A box contains 20 balls bearing numbers 1, 2, 3, 4, ......., 20. A ball is drawn at random from the box. What is the probability that the number on the ball is?**

**(a) not divisible by 10.**

**(b) an odd number**

**(c) divisible by 2 or 3**

**(d) prime number**

**26. The point R divides the line segment AB, where A (-4, 0) and B (0, 6) are such that AR = ¾ AB. Find the co – ordinate R.**

**27. A toy is in the form of a cone mounted on a hemisphere with same radius. The diameter of the base of the conical portion is 7 cm and the total height of the toy is 14.5 cm. Find the volume of the toy. [Use π = 22/7]**

**28. A toy is in the form of a cone mounted on a hemisphere of common base radius 7 cm. The total height of the toy is 31 cm. Find the total surface area of the toy. [Use π = 22/7]**

**Section – D**

**29. Construct a triangle ABC with BC = 6 cm, $\angle A = 60^0$ and median AD through A is 5 cm long. Construct a triangle A'BC' similar to triangle ABC, with BC' = 8 cm. Write steps of construction.**

**30. The interior angle of a polygon are A.P. The smallest angle is $120^0$ and the common difference is $5^0$. Find the number of sides of polygon.**

**31. The sum of the radius of the base and the height of a solid cylinder is 37 cm. If the total surface area of the solid cylinder is 1628 cm2, find the volume of the cylinder.**

**(Take п = 22/7)**

**32. There are two poles, one each on either bank of river just opposite to each other one pole is 60 m high from the top of this pole, the angle of depression of the top and the foot of the other pole are $30^0$ and $60^0$ respectively. Find the width of the river and the height of the other pole.**

**33. Solve for x:**

**$2 (x^2 +1/x^2) - 3 (x - 1/x) - 4 = 0$**

**34. Prove that the tangent at any point of a circle is perpendicular to the radius through the point of contact.**