MODEL QUESTION PAPER - 2

I. Four alternatives are given to each of the following questions. Choose the most appropriate. **(1*8 = 8)**

1. If the n^{th} term of a sequence is $\frac{n}{(n+1)}$, then the 2^{nd} term of the sequence is ____

   A) $\frac{3}{4}$ (B) $\frac{2}{3}$ (C) $\frac{1}{3}$ (D) $\frac{1}{2}$

2. The mean of the data: 4, 10, 5, 9, 12 is;

   A) 8 (B) 10 (C) 9 (D) 15

3. In Δ ABC, AB = $6\sqrt{3}$ cm, AC = 12 cm, BC = 6cm, the angle B is

   A)45° (B) 90° (C) 60° (D) 30°

4. The formula used to find volume of sphere__

   A) $\frac{4}{3}\pi r^3$ (B) $\frac{2}{3}\pi r^3$ (C)$\frac{1}{3}\pi r^3$ (D) πr^3

5. The distance between origin and P (x, y) is

   (A)$\sqrt{x^2+y^2}$ (b) $\sqrt{(x_2-x_1)^2}$ (c) x^2+y^2 (d) none of the above

6. The point which is on the x-axis is

   (a) (-2,0) (b) (3,0) (c) (10,0) d) all of the above

7. The number of tangents that can be drawn to a circle from a point inside it is /are (a) 2

   (b) 0 (c) 1 (d) many

8. If the surface area of a sphere is numerically equal to its volume, then r =

   (a)1cm (b) 2cm (c) 3cm (d) 12cm

II. Answer the following questions. **1x8=8**

9. In an A.P $a_n=3n+2$, then find 12^{th} term?
10. Write the discriminant of the quadratic equation $ax^2+c=0$?
11. The length of a tangent from a point A at distance 5cm from the center of the circle is 4cm. Find the radius of the circle.
12. Find the distance between origin and the given point (9,9).
13. Find the surface area of a sphere of radius 21cm.
14. If $P(x) = 2x^3 + 3x^2 - 11x + 6$, then find the value of P (1).

15. If $\tan\theta = \frac{8}{15}$, then find Sin θ and Cos θ.

16. Find the Value of cos90° + tan 45°

III. Answer the following questions. 2x8=16

17. How many three digits numbers are divisible by 7?

18. Solve 3x+2y=11

    5x-2y=13

19. Find the point on the x-axis is equidistant from (2, -5) and (-2,9).

    OR

    Find the distance between the points A (6,5) and B (4,4).

20. Solve x^2-7x+12=0, by formula method.

21. A conical vessel whose internal radius is 5cm and height 24cm is full of water. The water is emptied into a cylindrical vessel with internal radius l0cms. Find the height to which the water rises.

    OR

    A metallic sphere of radius 4.2cm is melted and recast into the shape of a cylinder of radius 6 cm. Find the height of the cylinder.

22. Draw a circle of radius 4cm and construct a pair of tangents to the circle from a point 8cm away from the center.

23. Find the quotient and remainder when $P(x) = 2x^2 + 3x + 1$ is divided by $g(x) = x + 2$.

24. A cubical die numbered from 1 to 6 is rolled twice. Find the probability of getting the sum of numbers on its faces is 10.

IV. Answer the following: 3x9=27

25. Find the value of K if the points A (2, 3) B (4, k) and C (6, -3) are collinear.

    OR

    Find the coordinates of the points of trisection of the line segment joining (4,1) and (-2, -3).

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

    OR

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

27. A passenger train takes 2 hours less for a journey of 300 km, if its speed is increased by 5 km/hr from its usual speed. Find its usual speed of the train.

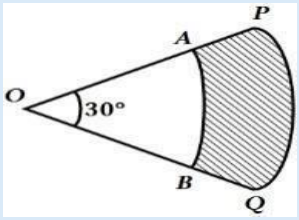
OR

A natural number when subtracted from 28, becomes equal to 160 times its reciprocal. find the number.

28. Draw a less than Ogive for the given data:

C.I	20 - 30	30 - 40	40 - 50	50 - 60	60 - 70
f	5	4	3	8	7

29. In figure, PQ and AB are respectively the arcs of two concentric circles of radii 7 cm and center O. If $\angle POQ$=30°, then find the area of the shaded region. (Use $\pi=\frac{22}{7}$) .



30. Construct a triangle of sides 4 cm, 5 cm and 6 cm and then a triangle similar to it whose sides are 2/3 of the corresponding sides of the first triangle.

31. Evaluate $\frac{\sin 30°+tan45°-cosec60°}{sec30°+\cos 60°+cot45°}$

OR

Prove that $\frac{tan\theta}{1-cot\theta}+\frac{cot\theta}{1-tan\theta}=1+tan\theta+cot\theta$

32. Find the median for the following data.

C.I	0-10	10-20	20-30	30-40	40-50
f	3	5	3	9	5

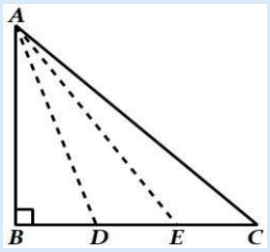
OR

Calculate the mode for the following data.

C.I	1-4	4-7	7-10	10-13	13-16	16-19
F	6	30	40	16	4	4

33. In Figure, ΔABC is right angled at B. D and E trisect BC. Prove that

8 $AE^2 = 3\ AC^2 + 5\ AD^2$.



V. Solve the following: 4x4 = 16

34. Solve graphically: 2x + y =5 and x + y = 4
35. Prove that "The ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides.
36. In an AP whose first term is 2, the sum of first five terms is one fourth the sum of the next five terms. Show that $a_{20} = -112$. Find S_{20}.

OR

If 7 times the 7^{th} term of an A.P is equal to 11 times the 11^{th} term. Prove that 18^{th} term is equal to zero.

37. A medicine capsule is in the shape of a cylinder with two hemispheres stuck to each of its ends. The length of the entire capsule is 14 mm and the diameter of the capsule is 5 mm. Find its surface area.

VI. Do as directed. 1x5=5

38. A bucket is in the form of a frustum of a cone with a capacity of 12308.8 cm^3. The radii of the top and bottom circular ends of the bucket are 20 cm and 12 cm respectively. Find the height of the bucket and also the area of metal sheet used in making it.

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