MATHEMATICS   Time :3hour

Grade: X   SUMMATIVE ASSESSMENT-II   Mark: 90

Very Short Answer Type Questions[1 Mark each]

1. If 9th term of an AP be zero, then the ratio of its 29th and 19th term is:_____.
2. From a point P which is at a distance of 13cm from the centre O of a circle of radius 5cm, the pair of tangents PQ and PR to the circle is drawn. Then the area of the quadrilateral PQOR is_____.
3. If the ratio of height of a tower and the length of its shadow on the ground is $\sqrt{3}:1$, then the angle of elevation of sun is:___ .
4. Find the probability that a leap year selected at random will contains 53 Sundays.

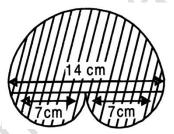## Short Answer Type Questions - I [2 Marks each]

5. Use completing the square method to find the roots of quadratic equation: $4x^2 + 4bx - (a^2 - b^2) = 0$.

6. Find the value of x, if the distance between the points (x, -1) and (3, 2) is 5.

7. Two concentric circles are of radius 5*cm* and 3*cm*. Find the length of the chord of the larger circle which touches the smaller circle.

8. Find the volume of the largest solid right circular cone that can be cut out of a solid cube of side 14cm. [use $\pi = \frac{22}{7}$].

9. Find the value(s) of k for which quadratic equation $3x^2 - 5x + 2k = 0$, has equal roots.
10. Show that the points (1, 1), (-2, 7) and (3, -3) are collinear.

Short Answer Type Questions - II [3 Marks each]

11. A fast train takes 3 hours less than a slow train for journey of 600km. if the speed of the slow train is 10km/h less than that of the fast train, find the speeds of the two trains

12. Find the area of the shaded region of the figure. [use $\pi = \frac{22}{7}$].

13. If the sum of 1st n terms of an A.P. is given by $S_n = 3n^2 + 2n$. Find n^{th} term of the A.P.

14. Prove that the tangent at any point of a circle is perpendicular to the radius through the point of contact.
15. Draw a circle of radius 3.5 cm. From a point 6 cm away from the centre, construct a pair of tangents to the circle and measure of their lengths.
16. The angle of elevation of a jet fighter from a point A on the ground is 60^0. After a flight of 10 seconds the angle of elevation changes to 30^0. If the jet is flying at a speed of 432km/hr, find the constant height at which the jet is flying.
17. A bag contains 3 red balls, 5 black balls and 4 white balls. A ball is drawn at random from the bag. What is the probability that the ball drawn is   (i) white (ii) red   (iii) black   (iv) not red.
18. If the points (-2, 1), (a, b) and (4, -1) are collinear and a-b =1, then find the value of a and b.

19. Find the areas of both the segments of a circle of radius 42cm with central angle 120^0. (sin $120^0 = \dfrac{\sqrt{3}}{2}$ & $\sqrt{3} = 1.73$ and $\pi = \dfrac{22}{7}$].

20. A solid sphere of radius 3 cm is melted and then cast into small spherical balls each of diameter 0.6 cm. Find the number of balls thus obtained.

Long Answer Type Questions [4 Marks each]

21. Solve the following equation for x: $9x^2 - 9(a+b)x + (2a^2 + 5ab + 2b^2) = 0$.

22. The sum of three numbers in A.P. is 27and their product is 405. Find the numbers.

23. The radius of the in-circle of a triangle is $4cm$ and the segments into which one side is divided by the point of contact are $6cm$ and $8cm$. Determine the other two sides of the triangle.

24. Construct a triangle ABC of sides 4cm, 5cm and 6 cm. Then construct another triangle similar to it whose sides are $\dfrac{5}{3}$ times the corresponding sides of the given triangle. Write the step of construction.

25. If the angle of elevation of a cloud from a point h meters above a lake is α and the angle of depression of its reflection in the lake be β, prove that the distance of the cloud from the point of observation is
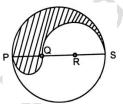
$$\dfrac{2h\sec\alpha}{\tan\beta - \tan\alpha}.$$

26. A hollow cone is cut by a plane parallel to the base and the upper portion is removed. If the curved surface of the remainder is $\dfrac{8}{9}$ of the curved surface of the whole cone, find the ratio of the line-segment into which the cone's altitude is divided by the plane.

27. PQRS is a diameter of a circle of radius 6cm. The lengths PQ, QR and RS are equal. Semicircles are drawn on PQ and QS as diameters as shown in figure. Find the perimeter and area of the shaded portion.

28. A card is drawn at random from a pack of 52 cards. Find the probability that the card drawn is
    (i) a black king   (ii) either a black card or a king   (iii) a jack, queen or a king

29. The line joining (5, -6) and (-7, 5) is trisected; find the coordinates of the points of trisection.

30. In an A.P., the sum of its first ten terms is -80 and the sum of its next ten terms is -280. Find the A.P.

31. The circumference of the base of a conical tent is 44m. If the height of the tent is 24cm, find the length of the canvas used in making the tent, if the width of the canvas is 2m. [Use $\pi = 22/7$].

*****xxx*****