Brilliant Education Centre, Doha, Qatar

MATHEMATICS

Grade: X | SUMMATIVE ASSESSMENT-II | Time :3hour | Mark: 90

Very Short Answer Type Questions[1 Mark each]

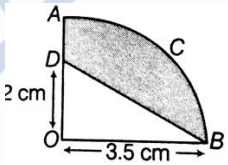
1. The positive root of $\sqrt{3x^2+6}=9$ is:
2. The common point of the tangent and the circle is called _____.
3. If the ratio of height of a tower and the length of its shadow on the ground is $\sqrt{3}:1$, then the angle of elevation of the sun is _____.
4. Find the probability that a leap year selected at random will contains 53 Tuesday.

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 $\pi=22/7$].
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. ₹6500 were divided equally among a certain number of persons. Had there been 15 more persons, each would have got ₹30 less. Find the original number of persons.
12. In fig., OACB is a quadrant of circle with centre O and radius 3.5cm. If OD=2cm, find the area of the shaded region. $\left[Use\ \pi=\frac{22}{7}\right]$.

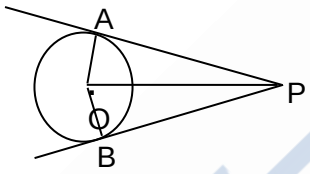


13. Divide 24 in three parts such that they are in A.P. and their product 440.
14. Two tangents TP and TQ are drawn to a circle with centre O from an external T. Prove that: $\angle PTQ=2\angle OPQ$
15. Draw a circle of radius 6 cm. From a point 10 cm away from the centre, construct a pair of tangents to the circle and measure of their lengths.
16. The angles of elevation of the top of a tower from two points at a distance of 4 m and 9 m from the base of the tower and in the same straight line with it are complementary. Prove that the height of the tower is 6 m.
17. Tickets numbered from 1 to 20 are mixed up and a ticket is drawn at random. What is the probability that the ticket drawn has a number which is 1) a multiple of 3 or 7 2) Multiple of 3 and 7.

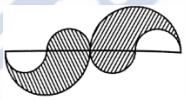
18. Find the ratio in which the point (-3, m) divides the line segment joining the points (-5, -4) and (-2, -3). Hence find the value of m.
19. The diameter of a circular pond is 17.5m. It is surrounded by a path of width 3.5m. Find the area of the path.
20. Water is being pumped out through a circular pipe whose internal diameter is 7cm. If the flow of water is 72cm per second, how many litres of water are being pumped out in one hour ?

Long Answer Type Questions [4 Marks each]

21. A plane left 40 minutes late due to bad weather and in order to reach destination, 1600*km* away in time, it had to increase its speed by 400*km/hr* from its usual speed. Find its usual speed.
22. How many terms of the A.P.63, 60, 57, ……must be taken so that their sum is 693? Explain double answer.
23. In figure, OP is equal to diameter of the circle. Prove that ABP is an equilateral triangle.



24. Construct an isosceles triangle whose base is 8 cm and altitude 4 cm and then another triangle whose side are 1½ times corresponding sides of the isosceles triangle. Write steps of construction.
25. The angle of elevation of the top of a chimney from the foot of a tower is 60^0 and the angle of depression of the foot of the chimney from the top of the tower is 30^0. If the height of the tower is 40m, find the height of the chimney. According to pollution control norms, the minimum height of a smoke emitting chimney should be 100m. State if the height of the above mentioned chimney meets the pollution norms. What value is discussed in this question?
26. From a solid cylinder whose height is 2.4cm and diameter1.4cm, a conical cavity of the same height and same diameter is hollowed out. Find the total surface area of the remaining solid to the nearest cm^2. [Use $\pi = 22/7$]
27. The given figure consists of four semicircle of equal radii and two big semicircles of equal radii (each 42cm). Find the area and perimeter of the shaded region. [use $\pi = 22/7$].



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 (iv) neither an ace nor a king.
29. Median of a triangle divides it into two triangles of equal areas. Verify this result for Δ ABC whose vertices are A(4, -6), B(3, -2) and C(5, 2).
30. A sum of Rs 2800 is to be used to give four cash prizes to students of a school for their overall academic performance. If each prize is Rs 200 less than its preceding prize, find the value of each prize.
31. The radii of circular ends of a solid frustum of a cone are 33cm and 27cm. Its slant height is 10cm. Find the volume and the total surface area of the frustum.

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