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SAMPLE PAPER 4

CLASS 10

General Instructions:

- 1. All questions are compulsory.
- The question paper consists of 31 questions divided into four sections A, B, C and D.
- 3. Section A contains 4 questions of 1 mark each, Section B contains questions of 2 marks each, Section C contains 10 questions of 3 marks each and Section D contains 11 questions of 4 marks each.
- 4. In question on construction, the drawing should be neat and exactly as per the given measurements.
- 5. Use of calculators is not permitted.

Section – A

Question numbers 1 to 4 carry 1 mark each.

- 1. Give steps to locate and mark a point P on the line segment AB such that $\frac{AP}{AB} = \frac{3}{7}$
- 2. If a, a 2, 3a are in A.P., then find the value of a.
- 3. In a rectangular field of area 231 m², there is a square garden of side 7 m. A parachute jumps from a helicopter to land in the field. What is the probability that he will land in a square garden?
- 4. The ratio of the bases of a cylinder and a cone of the same height are in the ratio 3 : 4. Find the ratio of their volumes.

Section – B

Question numbers 5 to 10 carry 2 marks each.

5. If (-4) is the root of the quadratic equation $x^2 + px - 4 = 0$ and the equation $2x^2 + px + k = 0$ has equal roots, find the value of k.

- 6. If 8 times the 8th term of an A.P. is equal to 9 times the 9th term, then find the 17th term of the A.P.
- 7. In the given figure, $\angle ADC = 90^{\circ}$, BC = 38 cm, CD = 28 cm and BP = 25 cm, find the radius of the circle.



- 8. If the length of a rod and its shadow are in the ratio $1 : \sqrt{3}$, then find the angle of elevation of the sun.
- 9. Find *a*, so that the point (3, *a*) lies on the line represented by 2x 3y 5 = 0. Also find the coordinates of the point where the line cuts the *x* axis.
- 10. Find the coordinates of point A, where AB is diameter of a circle whose centre is (2, -3) and point B has coordinates (1, 4).

Section – C

Question numbers 11 to 20 carry 3 marks each.

- 11. Find two positive numbers whose squares have the difference 48 and sum of numbers is 12.
- 12. The sum of first *n* terms of an A.P. is $5n^2 3n$. Find the A.P. and also find its 20th term.
- 13. Find the length of the tangent drawn from a point, whose distance from the boundary of a circle is 2 cm and radius of the circle is 3 cm.
- 14.A circle is inscribed in a triangle having sides 8 cm, 10 cm and 12 cm as shown. Find AD, BE and CF.



15.Base of two towers of height h_1 and h_2 are at A and B respectively. P is a point on AB, such that AB : AP = 3 : 1 and the angle of elevation of the top of towers of heights h_1 and h_2 from point P are 60^0 and 30^0 respectively. Find $h_1 : h_2$.

- 16. The angles of elevation of the top of the tower, as seen from two points A and B situated in the same line and at distances *a* and *b* respectively, from the foot of the tower are complementary. Prove that the height of the tower is \sqrt{ab} .
- 17.Cards marked with numbers 13, 14, 15,, 60 are placed in a box and mixed thoroughly. One card is drawn at random from the box. Find the probability that the number on the card is:
- a. Divisible by 5
- b. Number is a perfect square
- 18. Find the area of a rhombus whose vertices are (3, 0), (4, 5), (-1, 4) and (-2, -1) taken in order.
- 19.From a solid cylinder whose height is 2.4 cm and diameter is 1.4 cm, 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 cm².
- 20.Right circular cylinder having diameter 12 cm and height 15 cm is full of ice cream. This icecream is to be filled in cones of height 12 cm and diameter 6 cm having a hemispherical shape on the top. Find the number of such cones which can be filled with the icecream.

Section – D

Question numbers 21 to 31 carry 4 marks each.

- 21.A man bought certain number of toys for Rs. 180. He kept one for his own use and sold the rest for one rupee each more than he gave for them. Besides getting his own toy for nothing, he made a profit of Rs. 10. Find the number of toys he instantly bought.
- 22.An A.P. has 21 terms. The sum of three consecutive middle terms is 129 and the sum of last three terms is 237. Find the A.P.
- 23.In the given figure, perimeter of figure is $10(\pi + 2)$ cm, BC = 16 cm. Find the area of the shaded portion.



- 24.A sphere of diameter 12 cm is dropped in a right circular cylindrical vessel, partially filled with water. If the sphere is completely submerged in water, the water level in the vessel rises by $3\frac{5}{9}$ cm. Find the diameter of the cylindrical vessel.
- 25. Solve for $x: \frac{2x}{x-3} + \frac{1}{2x+3} + 3x + \frac{9}{(x-3)(2x+3)} = 0; x \neq 3, -\frac{3}{2}$
- 26.From an external point B of a circle with centre O, two tangents BC and BD are drawn such that $\angle DBC = 120^{\circ}$. Prove that BO = 2 BC.



- 27.King, queen and jack of diamond are removed from a pack of 52 playing cards and then the pack is well shuffled. A card is drawn from the remaining cards. Find the probability that the card drawn is:
- a. A heart
- b. A spade or queen
- c. Number 7 on a card.
- 28.Water is flowing at the rate of 15 km per hour through a pipe of diameter 14 cm into a rectangular tank which is 50 m long and 44 m wide and the owner makes sure that there is no wastage or leakage of water. Find the time in which the level of water in the tank will rise by 21 cm. What values are depicted by the owner of the tank?
- 29.Construct a triangle ABC in which CA = 6 cm, AB = 5 cm and $\angle BAC = 75^{\circ}$. Then construct a triangle A'BC' similar to the given triangle whose sides are $\frac{4}{2}$ times of the corresponding sides of the given triangle.
- 30. The radii of the circular ends of a solid frustum of a cone of height 6 cm are 14 cm and 6 cm respectively. Frustum is surmounted by a hemisphere of the same radius, on the smaller circular end. Find the total surface area of the solid body.
- 31. Find the ratio in which the line 3x + y 9 = 0 divides the line segment joining the points A(1, 3) and B(2, 7). Also, find the coordinates of the point of division.