

SUMMATIVE ASSESSMENT - II MATHEMATICS Class - X

JRAVRHB

Time allowed : 3 hours

Maximum Marks : 90

SECTION-A

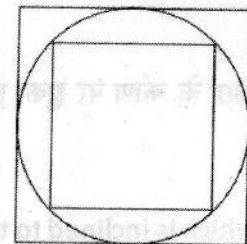
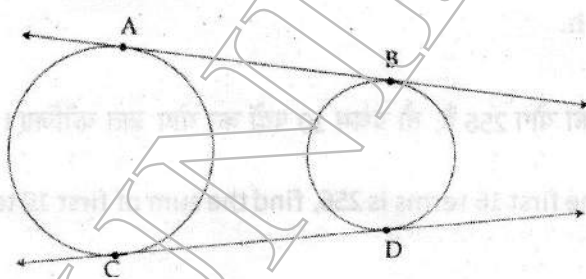
Question numbers 1 to 4 carry one mark each.

- 1 Find the value of $\sqrt{6 + \sqrt{6 + \sqrt{6 + \dots}}}$.
- 2 An observer 1.5 metres tall is 18.5 metres away from the tower. The angle of elevation of the top of the tower from his eye is 45° . What is the height of the tower?
- 3 A letter is chosen at random from the English alphabets what is the probability it is a letter of the word. 'MATHEMATICS'?
- 4 Determine in which quadrant the point P lies which divides the line segment joining the points A $(-5, \frac{3}{2})$ and B $(2, \frac{9}{2})$ in the ratio 3 : 4.

SECTION-B

Question numbers 5 to 10 carry two marks each.

- 5 The sum of 5th and 7th terms of an AP is 52 and the 10th term is 46. Find the common difference.
- 6 Find the nature of roots of the quadratic equation $3x^2 + 2x + 5 = 0$.
- 7 In two concentric circles, a chord of length 24 cm of larger circle becomes a tangent to the smaller circle whose radius is 5 cm. Find the radius of the larger circle.
- 8 Draw a line segment of length 7.8 cm and divide it in the ratio 5 : 8. Measure the two parts.
- 9 In the adjacent figure, AB and CD are common tangents to two circles of unequal radii. Prove that $AB = CD$.



- 10 In the figure, a square is inscribed in a circle of diameter 14 cm and another square is circumscribing the circle. Find the ratio of the area of the outer square to the area of the inner square.

SECTION-C

Question numbers 11 to 20 carry 3 marks each.

- 11 If sum of first 6 terms of an AP is 36 and that of the first 16 terms is 256, find the sum of first 10 terms. 3
- 12 A natural number, when increased by 3, equals 70 times its reciprocal. Find the number. 3
- 13 Construct a $\triangle ABC$ of sides $AB = 4$ cm, $BC = 5$ cm and $AC = 7$ cm. Construct another triangle similar to $\triangle ABC$ such that each of its sides is $\frac{5}{7}$ of the corresponding side of $\triangle ABC$. 3
- 16 Show that the points $A(1, 1)$, $B(2, 3)$, $C(3, 4)$ and $D(2, 2)$ form a parallelogram $ABCD$. 3
- 17 If the point (x, y) is equidistant from the points $(a - b, a + b)$ and $(-a - b, a + b)$, prove that $x - a = 0$. 3
- 18 Find the number of coins 1.5 cm in diameter and 0.2 cm thick to be melted to form a right circular cylinder whose height is 10 cm and diameter is 4.5 cm. 3
- 19 Find the area of the sector formulated by an arc, having length 4π cm, subtending an angle of 40° at the centre. 3
- 20 Find the mass of a solid cone of silver metal having base diameter 14 cm and vertical height 51 cm. 3
The density of silver is 10 g/cm^3 . (Use $\pi = \frac{22}{7}$)

SECTION-D

Question numbers 21 to 31 carry 4 marks each.

- 21 In an AP, the first term is 2 and the sum of first five terms is one-fourth of the next five terms. Show that 20th term of the AP is -112 . 4
- 22 If the roots of the equation $(a^2 + b^2)x^2 - 2(ac + bd)x + (c^2 + d^2) = 0$ are equal, then prove that $\frac{a}{b} = \frac{c}{d}$. 4
- 23 If in an AP, ratio of 4th term and 9th term is 1 : 3, find the ratio of 12th term and 5th term. 4
- 24 If all the sides of a parallelogram touch a circle, show that the parallelogram is a rhombus. 4
- 25 Draw a pair of tangents to a circle of radius 4 cm, which are inclined to each other at an angle of 45° . 4
- 26 From a point on the ground, 40 m away from the foot of a tower, the angle of elevation of the top of the tower is 30° . The angle of elevation of the top of a water tank (on the top of the tower) is 45° . Find: 4
(i) height of the tower (ii) the depth of the tank

Home based CPS Question Paper

27 In a class of 50 students, there are 18 girls and 32 boys. Of these students, 20 are vegetarians and rest non vegetarians and 12 of the vegetarians are boys. If a student is chosen at random, what is the probability of

- (A) choosing a girl ? (C) choosing a boy student who is non vegetarian ?
 (B) choosing a non vegetarian student ? (D) choosing a girl who is vegetarian ?

28 Find the mid-points of the sides of the triangle whose vertices are $(0, -1), (2, 1)$ and $(0, 3)$. Hence, find the length of each of its medians.

29 If the diameter of the cross-section of a wire is decreased by 5%, how much percent should the length be increased, so that the volume remains the same ?

30 A circular disc of radius 6 cm is divided into three sectors with central angles $120^\circ, 150^\circ$ and 90° . What part of the whole area is the area of the sector with central angle of 120° ? Also, find the ratio of the areas of the three sectors.

31 In a health Mela, a dart game was arranged and children who could make their aim to the unshaded area received some prizes. Find the area of the shaded region, where radii of two concentric circles with centre O are 14 cm and 21 cm respectively and $\angle XOY = 30^\circ$ (see figure). What value is depicted by it ?

(Use $\pi = \frac{22}{7}$)

