

## Summative Assessment – II

Class-X

Mathematics

Time: 3 hours

M. M. : 90

### General Instructions:

1. All questions are compulsory.
2. 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 6 questions of 2 marks each. Section C contains 10 questions of 3 marks each. Section D contains 11 questions of 4 marks each.
4. Use of calculators is not permitted.

### Section A

(Question numbers 1 to 4 carry 1 mark each)

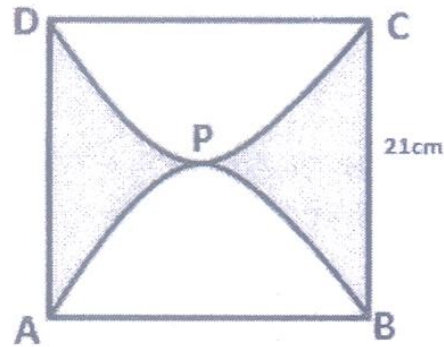
1. Find the value of  $k$ , for which one root of the quadratic equation  $kx^2 - 14x + 8 = 0$  is six times the other.
2. Find the tenth term of the sequence  $\sqrt{2}, \sqrt{8}, \sqrt{18}, \dots$
3. Out of 200 bulbs in a box, 12 bulbs are defective. One bulb is taken out at random from the box. What is the probability that the drawn bulb is not defective?
4. Find the value of  $a$ , for which point  $P\left(\frac{a}{3}, 2\right)$  is the midpoint of the line segment joining the points  $Q(-5, 4)$  and  $R(-1, 0)$ .

### Section B

(Question numbers 5 to 10 carry 2 marks each)

5. If 2 is a root of the equation  $x^2 + kx + 12 = 0$  and the equation  $x^2 + kx + q = 0$  has equal roots, find the value of  $q$ .

6. How many two digit numbers are divisible by 7?
7. Find a relation between  $x$  &  $y$  such that the point  $P(x,y)$  is equidistant from the points  $A(-5,3)$  and  $B(7,2)$ .
8. Find the perimeter of the shaded region if  $ABCD$  is a square of side 21 cm and  $APB$  &  $CPD$  are semicircles. (Use  $\pi=22/7$ ).



9. A sphere of diameter 6cm is dropped in a right circular cylindrical vessel partly filled with water. The diameter of the cylindrical vessel is 12 cm. If the sphere is completely submerged in water, by how much will the level of water rise in the cylindrical vessel?
10. Find the number of coins of 1.5 cm diameter and 0.2 cm thickness to be melted to form a right circular cylinder of height 10 cm and diameter 4.5 cm.

### Section C

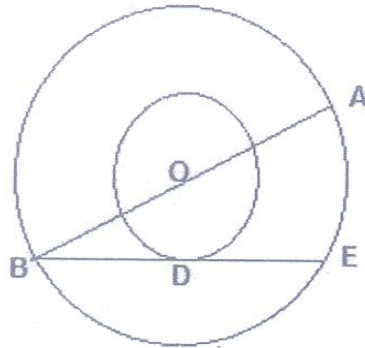
(Question numbers 11 to 20 carry 3 marks each)

11. Solve  $\frac{1}{(a+b+x)} = \frac{1}{a} + \frac{1}{b} + \frac{1}{x}$ ,  $a+b \neq 0$ .

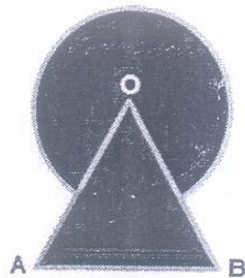
12. In an AP, the sum of first  $n$  terms is  $\frac{3n^2}{2} + \frac{13n}{2}$ . Find the 25<sup>th</sup> term.

13. The ninth term of an AP is equal to seven times the second term and twelfth term exceeds five times the third term by 2. Find the first term and the common difference.

14. In the given figure, the radii of two concentric circles are 13 cm and 8 cm. AB is diameter of the bigger circle. BD is the tangent to the smaller circle touching it at D. Find the length AD.



15. P & Q are centres of circles of radii 9 cm and 2 cm respectively.  $PQ = 17$  cm. R is the centre of the circle of radius  $x$  cm which touches the above circle externally. Given that angle PRQ is  $90^\circ$ . Write an equation in  $x$  and solve it.
16. Draw a triangle ABC in which  $AB = 5$  cm,  $BC = 6$  cm and angle  $ABC = 60^\circ$ . Construct a triangle whose sides are  $\frac{5}{7}$  times the corresponding sides of triangle ABC.
17. One card is drawn from a well shuffled deck of 52 cards. Find the probability of getting (a) Non face card, (b) Black king or a Red queen, (c) Spade card.
18. Find the area of shaded region shown in the given figure where a circular arc of radius 6 cm has been drawn with vertex O of an equilateral triangle OAB of side 12 cm as centre.



19. Water is flowing at the rate of 0.7 m/sec through a circular pipe whose internal diameter is 2 cm into a cylindrical tank, the radius of whose base is 40 cm. Determine the increase in the level of water in half hour.



20. The perimeters of the ends of the frustum of a cone are 207.24 cm and 169.56 cm. If the height of the frustum be 8 cm, find the whole surface area of the frustum. (Use  $\pi = 3.14$ )

### Section D

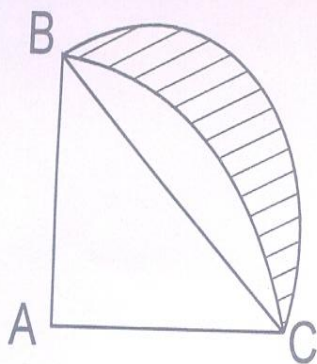
(Question numbers 21 to 31 carry 4 marks each)

21. Three eighths of the students of a class opted for visiting an old age home. Sixteen students opted for having a nature walk. Square root of total number of students in the class opted for tree plantation in the school. The number of students who visited an old age home is same as the number of students who went for a nature walk and did tree plantation. Find the total number of student. What values are inculcated in students through such activities?
22. The minimum age of children to be eligible to participate in a painting competition is 8 years. It is observed that the age of youngest boy was 8 years and the ages of rest of participants are having a common difference of 4 months. If the sum of ages of all the participants is 168 years, find the age of eldest participant in the painting competition.
23. Prove that the lengths of the tangents drawn from an external point to a circle are equal. Using the above theorem, prove that  $AB + CD = AD + BC$ , if a quadrilateral ABCD is drawn to circumscribe a circle.
24. Draw a pair of tangents inclined to each other at an angle of  $60^\circ$  to a circle of radius 3 cm.
25. From the top of tower, 100 m high, a man observes two cars on the opposite sides of the tower with the angles of depression  $30^\circ$  &  $45^\circ$  respectively. Find the distance between the cars. (Use  $\sqrt{3} = 1.73$ ).
26. From a point on the ground, the angles of elevation of the bottom and top of a tower fixed at the top of a 20 m high building are  $45^\circ$  &  $60^\circ$  respectively. Find the height of the tower.
27. Cards marked with numbers 3, 4, 5, ....., 50 are placed in a bag and mixed thoroughly. One card is drawn at random from the bag. Find the probability that number on the card drawn is:
- Divisible by 7.
  - A perfect square.

28 Show that A(1, 0), B(0, 1), C(1, 2) and D(2, 1) are vertices of a parallelogram ABCD. Is ABCD a rectangle? 4

29 A wall 24 m long, 0.4 m thick and 6 m high is constructed with bricks each of dimensions 25 cm×16cm×10 cm. If the mortar occupies  $\frac{1}{10}$  th of the volume of the wall, find the number of bricks used in constructing the wall. 4

30 4



In fig. ABC is a quadrant of circle of radius 14cm and a semicircle is drawn with BC as diameter. Find area of shaded region.

31 A school thought to collect the rainwater from the roof of the building, whose dimensions are 22 m×20 m by draining into a cylindrical vessel having diameter 7 m and height 4.2 m. If the vessel is just full, find the rainfall recorded in cm. 4

Why it is necessary to conserve water by doing these type of activities?