

**KENDRIYA VIDYALAYA SANGATHAN, HYDERABAD REGION**  
**MOCK TEST PAPER 03 FOR SA - II (2016-17)**

**SUBJECT: MATHEMATICS**

**BLUE PRINT : SA-II CLASS X**

<b>Unit/Topic</b>	<b>MCQ (1 mark)</b>	<b>Short answer (2 marks)</b>	<b>Short answer (3 marks)</b>	<b>Long answer (4 marks)</b>	<b>Total</b>
<b>Algebra</b> Quadratic Equations & Arithmetic Progression	1(1)	4(2)	6(2)	12(3)	<b>23(8)</b>
<b>Geometry</b> Circles & Construction	-	6(3)	3(1)	8(2)	<b>17(6)</b>
<b>Trigonometry</b> Heights & Distances	1(1)	-	3(1)	4(1)	<b>08(3)</b>
<b>Probability</b>	1(1)	-	3(1)	4(1)	<b>08(3)</b>
<b>Coordinate Geometry</b>	1(1)	-	6(2)	4(1)	<b>11(4)</b>
<b>Mensuration</b> Areas related to Circles & Surface Areas and Volumes	-	2(1)	9(3)	12(3)	<b>23(7)</b>
<b>Total</b>	<b>4(4)</b>	<b>12(6)</b>	<b>30(10)</b>	<b>44(11)</b>	<b>90(31)</b>

**MARKING SCHEME FOR SA – II**

<b>SECTION</b>	<b>MARKS</b>	<b>NO. OF QUESTIONS</b>	<b>TOTAL</b>
<b>VSA</b>	1	4	04
<b>SA – I</b>	2	6	12
<b>SA – II</b>	3	10	30
<b>LA</b>	4	11	44
<b>GRAND TOTAL</b>			<b>90</b>

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**SUBJECT: MATHEMATICS**

**MAX. MARKS : 90**

**CLASS : X**

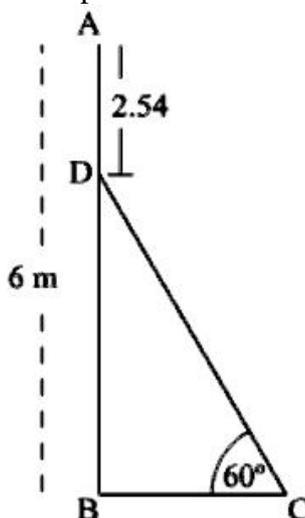
**DURATION : 3 HRS**

**General Instructions:**

1. All questions are compulsory.
2. Question paper is divided into four sections: Section A consists 4 questions each carry 1 marks, Sections B consists 6 questions each carry 2 marks, Sections C consists 10 questions each carry 3 marks and Sections D consists 11 questions each carry 4 marks.
3. There is no overall choice.
4. Use of Calculator is prohibited.

**SECTION – A**

1. Find the value of  $y$  if the first three terms of an AP respectively are  $3y - 1$ ,  $3y + 5$  and  $5y + 1$ .
2. In the below figure,  $AB$  is a 6 m high pole and  $CD$  is a ladder inclined at an angle of  $60^\circ$  to the horizontal and reaches up to a point  $D$  of pole. If  $AD = 2.54$  m, find the length of the ladder.

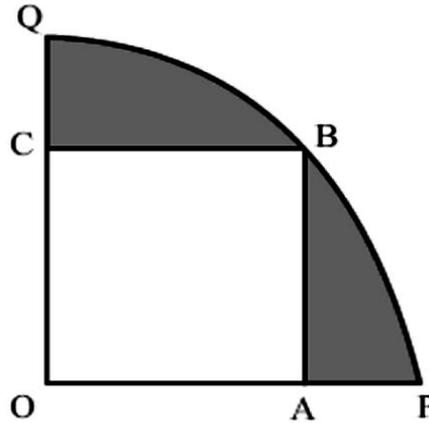


3. If the points  $A(x, 2)$ ,  $B(-3, -4)$  and  $C(7, -5)$  are collinear, then find the value of  $x$ .
4. A number is selected at random from the numbers 1 to 30. Find the probability that it is a prime number.

**SECTION – B**

5. The first and the last terms of an AP are 5 and 45 respectively. If the sum of all its terms is 400, find its common difference.
6. Prove that the line segment joining the points of contact of two parallel tangents of a circle, passes through its centre.
7. Solve the quadratic equation  $2x^2 + ax - a^2 = 0$  for  $x$ .
8. If from an external point  $P$  of a circle with centre  $O$ , two tangents  $PQ$  and  $PR$  are drawn such that  $\angle QPR = 120^\circ$ , prove that  $2PQ = PO$ .

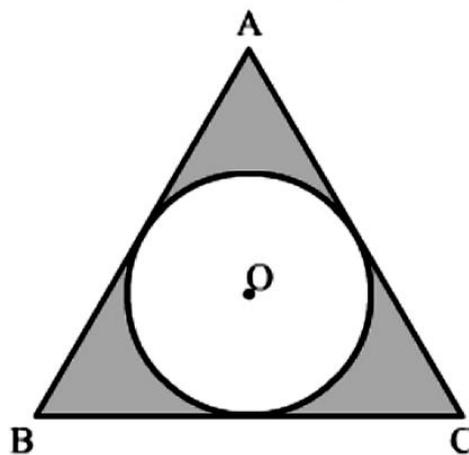
9. In the below figure, a square OABC is inscribed in a quadrant OPBQ of a circle. If OA = 20 cm, find the area of the shaded region. (Use  $\pi = 3.14$ )



10. Divide a line segment AB of length 8 cm in the ratio 3 : 5 internally .

### SECTION – C

11. Two ships are there in the sea on either side of a light house in such a way that the ships and the light house are in the same straight line. The angles of depression of two ships as observed from the top of the light house are  $60^\circ$  and  $45^\circ$ . If the height of the light house is 200 m, find the distance between the two ships. [Use  $\sqrt{3} = 1.73$  ]
12. A bag contains cards numbered from 1 to 49. A card is drawn from the bag at random, after mixing the cards thoroughly. Find the probability that the number on the drawn card is: (i) an odd number (ii) a multiple of 5 (iii) a perfect square
13. In the below figure, a circle is inscribed in an equilateral triangle ABC of side 12 cm. Find the radius of inscribed circle and the area of the shaded region. [Use  $\pi = 3.14$  and  $\sqrt{3} = 1.73$  ]



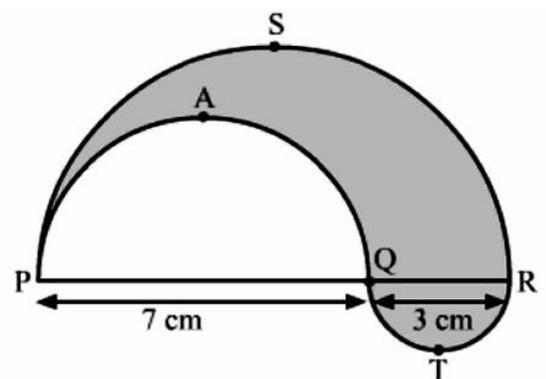
14. Solve the equation  $\frac{4}{x} - 3 = \frac{5}{2x+3}; x \neq 0, -\frac{3}{2}$  for x.
15. If the seventh term of an AP is  $\frac{1}{9}$  and its ninth term is  $\frac{1}{7}$ , find its 63rd term.
16. Draw a right triangle ABC in which AB = 6 cm, BC = 8 cm and  $\angle B = 90^\circ$ . Draw BD perpendicular from B on AC and draw a circle passing through the points B, C and D. Construct tangents from A to this circle.
17. If the point A(0, 2) is equidistant from the points B(3, p) and C(p, 5), find p. Also find the length of AB.

18. If the points A(-2, 1), B(a, b) and C(4, -1) are collinear and  $a - b = 1$ , find the values of a and b.
19. A farmer connects a pipe of internal diameter 20 cm from a canal into a cylindrical tank which is 10 m in diameter and 2 m deep. If the water flows through the pipe at the rate of 4 km per hour, in how much time will the tank be filled completely?
20. From a solid cylinder of height 2.8 cm and diameter 4.2 cm, a conical cavity of the same height and same diameter is hollowed out. Find the total surface area of the remaining solid.

### SECTION – D

21. Find the values of k for which the quadratic equation  $(k + 4)x^2 + (k + 1)x + 1 = 0$  has equal roots. Also find these roots.
22. In an AP of 50 terms, the sum of first 10 terms is 210 and the sum of its last 15 terms is 2565. Find the A.P.
23. The difference of two natural numbers is 5 and the difference of their reciprocals is  $\frac{1}{10}$ . Find the numbers.
24. Prove that a parallelogram circumscribing a circle is a rhombus.
25. Prove that the length of the tangents drawn from an external point to a circle are equal.
26. From a point P on the ground, the angle of elevation of the top of a 10 m tall building is  $30^\circ$ . A flag-staff is hoisted at the top of the building and the angle of elevation of the top of the flag-staff from P is  $45^\circ$ . Find the length of the flag-staff and the distance of the building from the point P.
27. Five cards—the ten, jack, queen, king and ace of diamonds, are removed from the well-shuffled 52 playing cards. One card is then picked up at random. Find the probability of getting (a) neither a spade nor a queen (b) a red card or a king. (c) either a diamond or a spade card (d) a black face card
28. Find the ratio in which the point P(x, 2) divides the line segment joining the points A(12, 5) and B(4, -3). Also find the value of x.
29. Sushant has a vessel, of the form of an inverted cone, open at the top, of height 11 cm and radius of top as 2.5 cm and is full of water. Metallic spherical balls each of diameter 0.5 cm are put in the vessel due to which  $\frac{2}{5}$ th of the water in the vessel flows out. Find how many balls were put in the vessel. Sushant made the arrangement so that the water that flows out irrigates the flower beds. What value has been shown by Sushant?

30. In the below figure, PSR, RTQ and PAQ are three semicircles of diameters 10 cm, 3 cm and 7 cm respectively. Find the area and perimeter of the shaded region. [Use  $\pi = 3.14$ ]



31. A solid metallic right circular cone 20 cm high and whose vertical angle is  $60^\circ$ , is cut into two parts at the middle of its height by a plane parallel to its base. If the frustum so obtained be drawn into a wire of diameter  $\frac{1}{12}$  cm, find the length of the wire.