KENDRIYA VIDYALAYA GACHIBOWLI, HYDERABAD – 32
SAMPLE PAPER 01 FOR SA – II (2016-17)

SUBJECT: MATHEMATICS

BLUE PRINT : SA-II CLASS X

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

MARKING SCHEME FOR SA – II

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

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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. If p – 1, p + 3, 3p – 1 are in AP, then find the value of p

2. Find the length of tangent drawn to a circle with radius 7 cm from a point 25 cm away from the centre.

3. One card is drawn from a well-shuffled deck of 52 cards then find the probability of getting a king of red colour.

4. Base radius of two cylinder are in the ratio 2 : 3 and their heights are in the ratio 5 : 3. Find the ratio of their volumes.

SECTION – B

5. Solve the equation: $2x^2 + 3x - 90 = 0$

6. Which term of the AP 3, 8, 13, 18,…… will be 55 more than its 20^{th} term?

7. ABC is an isosceles triangle in which AB = AC, circumscribed about a circle. Show that BC is bisected at the point of contact.

8. The radii of two circles are 8 cm and 6 cm respectively. Find the radius of the circle having area equal to the sum of the areas of the two circles.

9. Find the ratio in which the point (11, 15) divides the line segment joining the point (15, 5) and (9, 20).

10. For what value of k are the points (k, 2 – 2k), (–k + 1, 2k) and (–4 – k, 6 – 2k) are collinear.

SECTION – C

11. Find the value of k for which the quadratic equation $(k - 12)x^2 + 2(k - 12)x + 2 = 0$ has two real equal roots.

12. If the sum of first 7 terms of an AP is 49 and that of 17 terms is 289 , find the sum of first n terms

13. Two cones with same base radius 8 cm and height 15 cm are joined together along their bases. Find the surface area and volume of the shape so formed.

14. A letter is chosen at random from the letters of the word 'ASSASSINATION'. Find the probability that the letter chosen is a (i) vowel (ii) A (iii) S

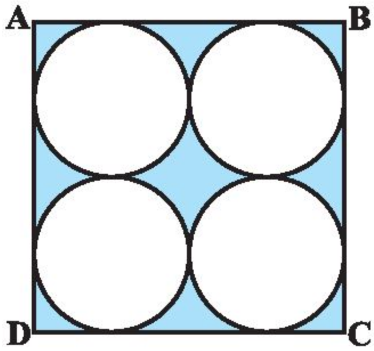
15. Prove that the parallelogram circumscribing a circle is a rhombus.

16. Draw a triangle ABC with side BC = 6 cm, AB = 5 cm and $\angle ABC = 60°$. Then construct a triangle whose sides are $\frac{3}{4}$ of the corresponding sides of the triangle ABC.

17. An ice cream cone full of ice cream having radius 5 cm and height 10 cm as shown in the below figure. Calculate the volume of ice cream, provided that its $\frac{1}{6}$ part is left unfilled with ice cream.

18. Find the area of a triangle formed by the points A(5, 2), B(4, 7) and C(7, – 4).

19. Find the area of the shaded region in the below Fig., where ABCD is a square of side 14 cm.



20. A canal is 300 cm wide and 120 cm deep. The water in the canal is flowing with a speed of 20 km/h. How much area will it irrigate in 20 minutes if 8 cm of standing water is desired?

SECTION – D

21. The angles of elevation of the top of a tower from two points at a distance of 'a' m and 'b' m from the base of the tower and in the same straight line with it are complementary, then prove that the height of the tower is $\sqrt{a.b}$.

22. If the points (10, 5), (8, 4) and (6, 6) are the midpoints of the sides of a triangle, find its vertices.

23. Prove that "The tangent at any point of a circle is perpendicular to the radius through the point of contact".

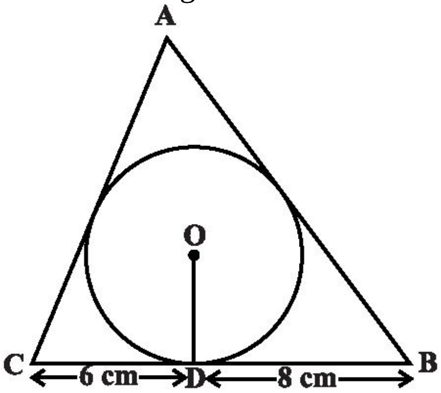
24. In a flight for 3000 km, an aircraft was slowed down due to bad weather. Its average speed for the trip was reduced by 100 km/hr and consequently time of flight increased by one hour. Find the original duration of flight.

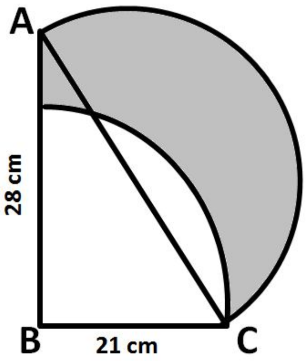
25. A straight highway leads to the foot of a tower. A man standing at the top of the tower observes a car at an angle of depression of 30°, which is approaching the foot of the tower with a uniform speed. Six seconds later, the angle of depression of the car is found to be 60°. Find the time taken by the car to reach the foot of the tower from this point.

26. A contract on construction job specifies a penalty for delay of completion beyond a certain date as follows: Rs 200 for the first day, Rs 250 for the second day, Rs 300 for the third day, etc., the penalty for each succeeding day being Rs 50 more than for the preceding day. How much money the contractor has to pay as penalty, if he has delayed the work by 30 days? What value depicted from this?

27. A child's game has 8 triangles of which 3 are blue and rest are red, and 10 squares of which 6 are blue and rest are red. One piece is lost at random. Find the probability that it is a (i) triangle (ii) square (iii) square of blue colour (iv) triangle of red colour

28. A triangle ABC is drawn to circumscribe a circle of radius 4 cm such that the segments BD and DC into which BC is divided by the point of contact D are of lengths 8 cm and 6 cm respectively as shown in below left figure. Find the sides AB and AC.





29. In the above right sided figure, ABC is a right angled triangle at B, AB = 28 cm and BC = 21 cm. With diameter a semicircle is drawn and with BC as radius a quarter circle is drawn. Find the area of the shaded region correct to two decimal places.

30. Solve the equation: $\frac{1}{a+b+x}=\frac{1}{a}+\frac{1}{b}+\frac{1}{x},[x\neq 0,-(a+b)]$

31. A hollow cone is cut by a plane parallel to the base and the upper portion is removed. If the curved surface of the remainder is $\frac{8}{9}$ of the curved surface of the whole cone. Find the ratio of the line segments into which the cone's altitude is divided by the plane.