KENDRIYA VIDYALAYA SANGATHAN, HYDERABAD REGION
MOCK TEST PAPER 07 FOR SA – II (2016–17)

SUBJECT: MATHEMATICS

<u>BLUE PRINT : SA-II CLASS X</u>

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)	4(2)	--	12(3)	**17(6)**
Trigonometry Heights & Distances	1(1)	--	3(1)	4(1)	**08(3)**
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	--	--	15(5)	8(2)	**23(7)**
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. A game of chance consists of spinning an arrow which comes to rest pointing at one of the numbers 1, 2, 3, 4, 5, 6, 7, 8 and these are equally likely outcomes. Find the probability that the arrow will point at any factor of 8.

2. Two concentric circles of radii a and b (a > b) are given. Find the length of the chord of the larger circle which touches the smaller circle.

3. Find the 25th term of the A.P. $-5, \dfrac{-5}{2}, 0, \dfrac{5}{2}, \ldots$

4. A pole casts a shadow of length $2\sqrt{3}$ m on the ground, when the sun's elevation is 60°. Find the height of the pole.
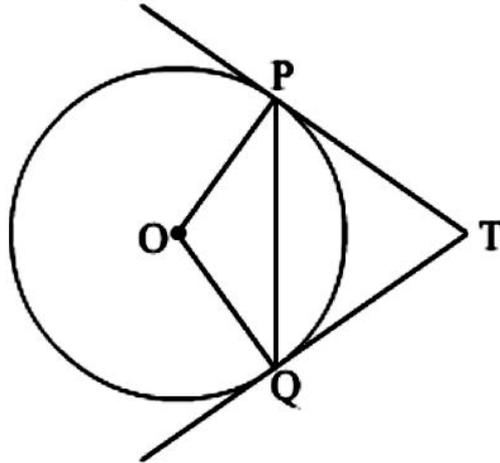
SECTION – B

5. In the below figure, O is the centre of a circle. PT and PQ are tangents to the circle from an external point P. If $\angle TPQ = 70°$, find $\angle TRQ$.
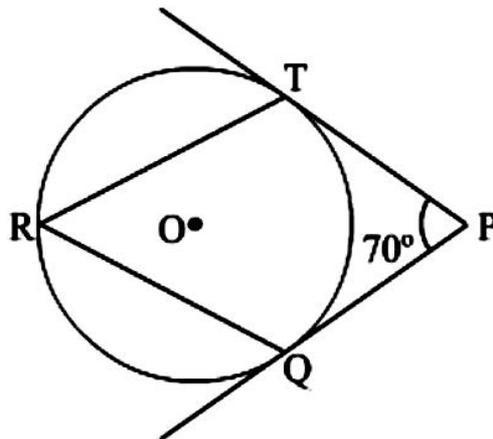
6. Solve for x : $x^2 - (\sqrt{3} + 1)x + \sqrt{3} = 0$

7. The fourth term of an A.P. is 11. The sum of the fifth and seventh terms of the A.P. is 34. Find its common difference.

8. Show that the points (a, a), (–a, –a) and $(-\sqrt{3}\,a, \sqrt{3}\,a)$ are the vertices of an equilateral triangle.

9. In the below figure, PQ is a chord of length 8 cm of a circle of radius 5 cm. The tangents at P and Q intersect at a point T. Find the lengths of TP and TQ.

10. For what values of k are the points (8, 1), (3, –2k) and (k, –5) collinear ?

SECTION – C

11. In the below Figure, ABCD is a trapezium with AB ∥ DC, AB = 18 cm, DC = 32 cm and the distance between AB and DC is 14 cm. If arcs of equal radii 7 cm have been drawn, with centres A, B, C and D, then find the area of the shaded region.
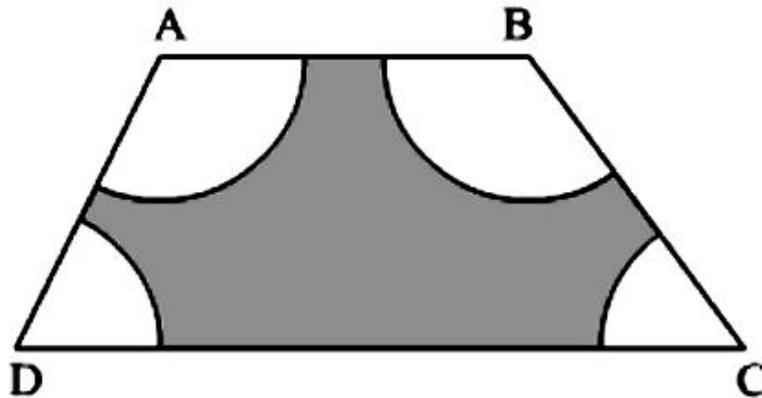

12. Point A lies on the line segment PQ joining P(6, –6) and Q(–4, –1) in such a way that $\dfrac{PA}{PQ} = \dfrac{2}{5}$.
If point P also lies on the line $3x + k(y + 1) = 0$, find the value of k.

13. The long and short hands of a clock are 6 cm and 4 cm long respectively. Find the sum of the distances travelled by their tips in 24 hours. (Use $\pi = 3.14$)

14. Two spheres of same metal weigh 1 kg and 7 kg. The radius of the smaller sphere is 3 cm. The two spheres are melted to form a single big sphere. Find the diameter of the new sphere.

15. A metallic cylinder has radius 3 cm and height 5 cm. To reduce its weight, a conical hole is drilled in the cylinder. The conical hole has a radius of $\dfrac{3}{2}$ cm and its depth is $\dfrac{8}{9}$ cm. Calculate the ratio of the volume of metal left in the cylinder to the volume of metal taken out in conical shape.

16. A solid right-circular cone of height 60 cm and radius 30 cm is dropped in a right-circular cylinder full of water of height 180 cm and radius 60 cm. Find the volume of water left in the cylinder, in cubic metres. (Use $\pi = \dfrac{22}{7}$)

17. Solve for x : $x^2 + 5x - (a^2 + a - 6) = 0$

18. In an A.P., if the 12th term is −13 and the sum of its first four terms is 24, find the sum of its first ten terms.

19. A bag contains 18 balls out of which x balls are red. (i) If one ball is drawn at random from the bag, what is the probability that it is not red? (ii) If 2 more red balls are put in the bag, the probability of drawing a red ball will be $\frac{9}{8}$ times the probability of drawing a red ball in the first case. Find the value of x.

20. From the top of a tower of height 50 m, the angles of depression of the top and bottom of a pole are 30° and 45° respectively. Find (i) how far the pole is from the bottom of a tower, (ii) the height of the pole. (Use $\sqrt{3} = 1.732$)

SECTION – D

21. In the below Figure, O is the centre of the circle and TP is the tangent to the circle from an external point T. If $\angle PBT = 30°$, prove that BA : AT = 2 : 1.
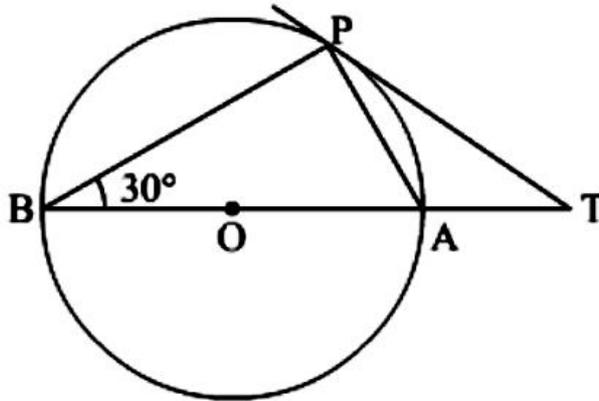
22. Draw a circle of radius 3 cm. From a point P, 7 cm away from its centre draw two tangents to the circle. Measure the length of each tangent.

23. Two poles of equal heights are standing opposite to each other on either side of the road which is 80 m wide. From a point P between them on the road, the angle of elevation of the top of a pole is 60° and the angle of depression from the top of another pole at point P is 30°. Find the heights of the poles and the distances of the point P from the poles.

24. A vessel full of water is in the form of an inverted cone of height 8 cm and the radius of its top, which is open, is 5 cm. 100 spherical lead balls are dropped into the vessel. One-fourth of the water flows out of the vessel. Find the radius of a spherical ball.

25. Milk in a container, which is in the form of a frustum of a cone of height 30 cm and the radii of whose lower and upper circular ends are 20 cm and 40 cm respectively, is to be distributed in a camp for flood victims. If this milk is available at the rate of Rs 35 per litre and 880 litres of milk is needed daily for a camp, find how many such containers of milk are needed for a camp and what cost will it put on the donor agency for this. What value is indicated through this by the donor agency ?

26. If x = −2 is a root of the equation $3x^2 + 7x + p = 0$, find the values of k so that the roots of the equation $x^2 + k(4x + k − 1) + p = 0$ are equal.

27. Find the middle term of the sequence formed by all three-digit numbers which leave a remainder 3, when divided by 4. Also find the sum of all numbers on both sides of the middle term separately.

28. The total cost of a certain length of a piece of cloth is Rs 200. If the piece was 5 m longer and each metre of cloth costs Rs 2 less, the cost of the piece would have remained unchanged. How long is the piece and what is its original rate per metre ?

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

30. A box contains cards bearing numbers from 6 to 70. If one card is drawn at random from the box, find the probability that it bears (i) a one digit number (ii) a number divisible by 5 (iii) an odd number less than 30 (iv) a composite number between 50 and 70.

31. The base BC of an equilateral triangle ABC lies on y-axis. The coordinates of point C are (0, −3). The origin is the mid-point of the base. Find the coordinates of the points A and B. Also find the coordinates of another point D such that BACD is a rhombus.

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