

KENDRIYA VIDYALAYA SANGATHAN, HYDERABAD REGION
MOCK TEST PAPER 08 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)	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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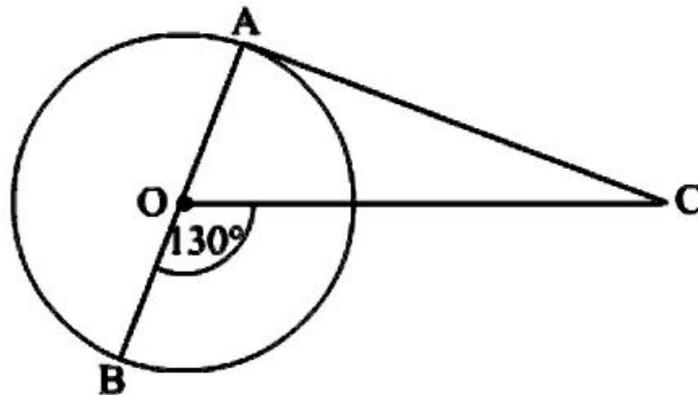
MAX. MARKS : 90
DURATION : 3 HRS

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. For what value of k will the consecutive terms $2k + 1$, $3k + 3$ and $5k - 1$ form an A.P. ?
2. 20 tickets, on which numbers 1 to 20 are written, are mixed thoroughly and then a ticket is drawn at random out of them. Find the probability that the number on the drawn ticket is a multiple of 3 or 7.
3. In the below figure, AOB is a diameter of a circle with centre O and AC is a tangent to the circle at A . If $\angle BOC = 130^\circ$, the find $\angle ACO$.

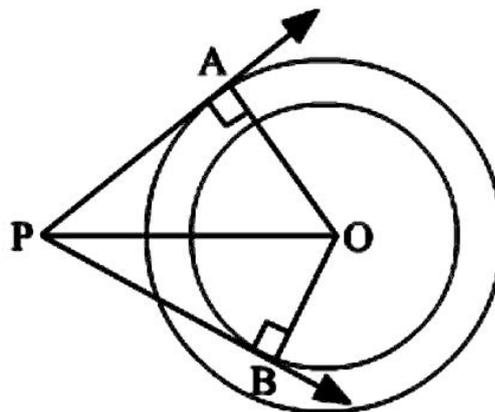
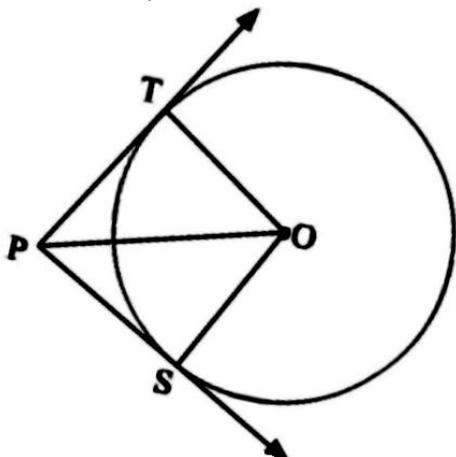


4. An observer, 1.7 m tall, is $20\sqrt{3}$ m away from a tower. The angle of elevation from the of observer to the top of tower is 30° . Find the height of tower.

SECTION – B

5. Prove that the points $(2, -2)$, $(-2, 1)$ and $(5, 2)$ are the vertices of a right angled triangle. Also find the area of this triangle.
6. If the ratio of sum of the first m and n terms of an AP is $m^2 : n^2$, show that the ratio of its m th and n th terms is $(2m - 1) : (2n - 1)$.
7. A two digit number is four times the sum of the digits. It is also equal to 3 times the product of digits. Find the number.
8. Find the ratio in which the point $(-3, k)$ divides the line-segment joining the points $(-5, -4)$ and $(-2, 3)$. Also find the value of k .

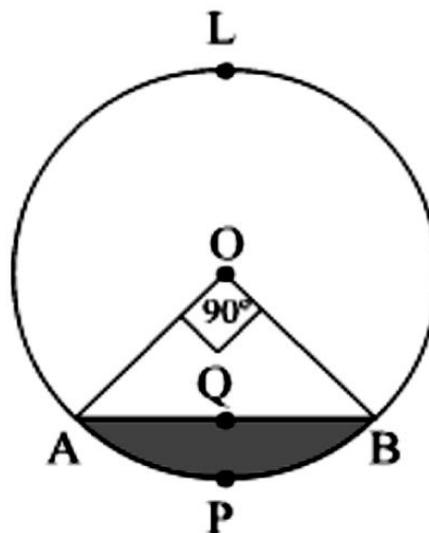
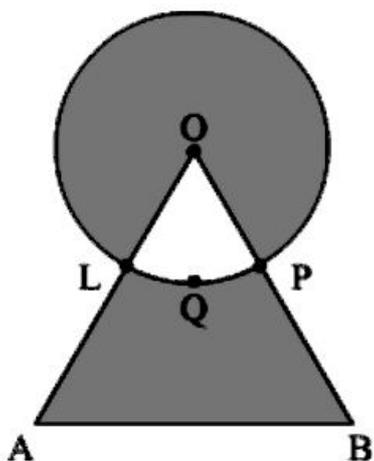
9. In below, from a point P, two tangents PT and PS are drawn to a circle with centre O such that $\angle SPT = 120^\circ$, Prove that $OP = 2PS$.



10. In the above right sided figure are two concentric circles of radii 6 cm and 4 cm with centre O. If AP is a tangent to the larger circle and BP to the smaller circle and length of AP is 8 cm, find the length of BP.

SECTION – C

11. Solve the given quadratic equation for x : $9x^2 - 9(a + b)x + (2a^2 + 5ab + 2b^2) = 0$.
12. A cylindrical tub, whose diameter is 12 cm and height 15 cm is full of ice-cream. The whole ice-cream is to be divided into 10 children in equal ice-cream cones, with conical base surmounted by hemispherical top. If the height of conical portion is twice the diameter of base, find the diameter of conical part of ice-cream cone.
13. A metal container, open from the top, is in the shape of a frustum of a cone of height 21 cm with radii of its lower and upper circular ends as 8 cm and 20 cm respectively. Find the cost of milk which can completely fill the container at the rate of Rs 35 per litre.
14. Find the area of shaded region in below left figure, where a circle of radius 6 cm has been drawn with vertex O of an equilateral triangle OAB of side 12 cm. (Use $\pi = 3.14$ and $\sqrt{3} = 1.73$)

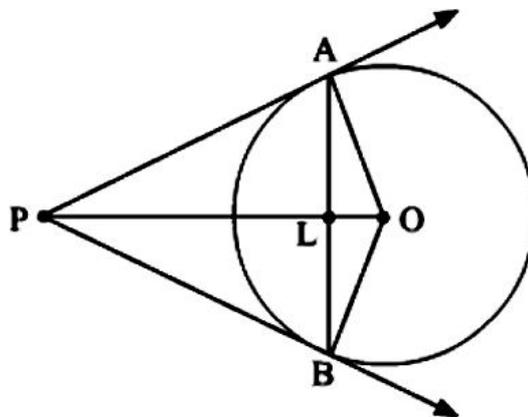


15. In the above right sided figure is a chord AB of a circle, with centre O and radius 10 cm, that subtends a right angle at the centre of the circle. Find the area of the minor segment AQBP. Hence find the area of major segment ALBQA. (use $\pi = 3.14$)

16. If the point C $(-1, 2)$ divides internally the line-segment joining the points A $(2, 5)$ and B (x, y) in the ratio $3 : 4$, find the value of $x^2 + y^2$.
17. Divide 56 in four parts in AP such that the ratio of the product of their extremes (1st and 4th) to the product of means (2nd and 3rd) is $5 : 6$.
18. Two men on either side of a 75 m high building and in line with base of building observe the angles of elevation of the top of the building as 30° and 60° . Find the distance between the two men. (Use $\sqrt{3} = 1.73$)
19. A game consist of tossing a one-rupee coin 3 times and noting the outcome each time. Ramesh will win the game if all the tosses show the same result, (i.e. either all thee heads or all three tails) and loses the game otherwise. Find the probability that Ramesh will lose the game.
20. A hemispherical tank, of diameter 3 m, is full of water. It is being emptied by a pipe at the rate of $3\frac{4}{7}$ litre per second. How much time will it take to make the tank half empty?

SECTION – D

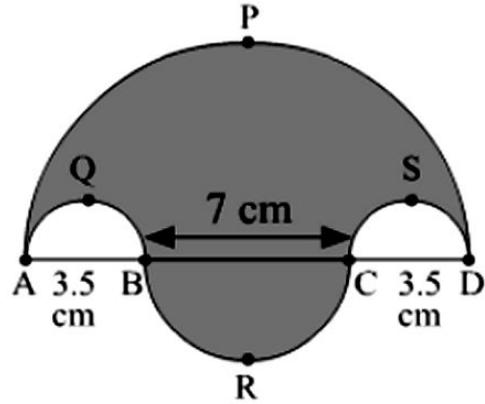
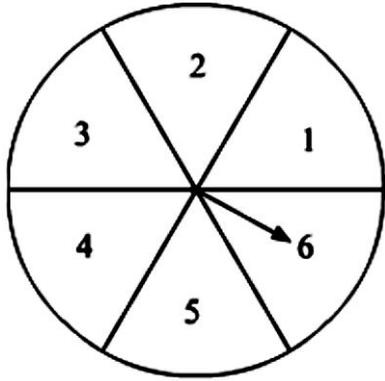
21. A pole has to be erected at a point on the boundary of a circular park of diameter 17 m in such a way that the differences of its distances from two diametrically opposite fixed gates A and B on the boundary is 7 metres. Find the distances from the two gates where the pole is to be erected.
22. Prove that the lengths of tangents drawn from an external point to a circle are equal.
23. Draw a ΔABC in which $AB = 4$ cm, $BC = 5$ cm and $AC = 6$ cm. Then construct another triangle whose sides are $\frac{5}{3}$ of the corresponding sides of ΔABC .
24. Find the positive value(s) of k for which quadratic equations $x^2 + kx + 64 = 0$ and $x^2 - 8x + k = 0$ both will have real roots.
25. In the below figure, AB is a chord of a circle, with centre O, such that $AB = 16$ cm and radius of circle is 10 cm. Tangents at A and B intersect each other at P. Find the length of PA.



26. A vertical tower stands on a horizontal plane and is surmounted by a flagstaff of height 5 m. From a point on the ground the angles of elevation of the top and bottom of the flagstaff are 60°

and 30° respectively. Find the height of the tower and the distance of the point from the tower. (take $\sqrt{3} = 1.732$)

27. In the below figure is shown a disc on which a player spins an arrow twice. The fraction $\frac{a}{b}$ is formed, where 'a' is the number of sector on which arrow stops on the first spin and 'b' is the number of the sector in which the arrow stops on second spin. On each spin, each sector has equal chance of selection by the arrow. Find the probability that the fraction $\frac{a}{b} > 1$.



28. Find the area of the shaded region in above right figure, where \widehat{APD} , \widehat{AQB} , \widehat{BRC} and \widehat{CSD} , are semi-circles of diameter 14 cm, 3.5 cm, 7 cm and 3.5 cm respectively. [Use $\pi = \frac{22}{7}$]
29. Reshma wanted to save at least Rs 6,500 for sending her daughter to school next year (after 12 month.) She saved Rs 450 in the first month and raised her savings by Rs 20 every next month. How much will she be able to save in next 12 months? Will she be able to send her daughter to the school next year? What value is reflected in this question.

30. The co-ordinates of the points A, B and C are (6, 3), (-3, 5) and (4, -2) respectively. P(x, y) is any point in the plane. Show that $\frac{\text{ar}(\Delta PBC)}{\text{ar}(\Delta ABC)} = \left| \frac{x + y - 2}{7} \right|$

31. In the below figure shown a right circular cone of height 30 cm. A small cone is cut off from the top by a plane parallel to the base. If the volume of the small cone is $\frac{1}{27}$ of the volume of cone, find at what height above the base is the section made.

