

KENDRIYA VIDYALAYA SANGATHAN, HYDERABAD REGION
MOCK TEST PAPER 06 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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CLASS : X

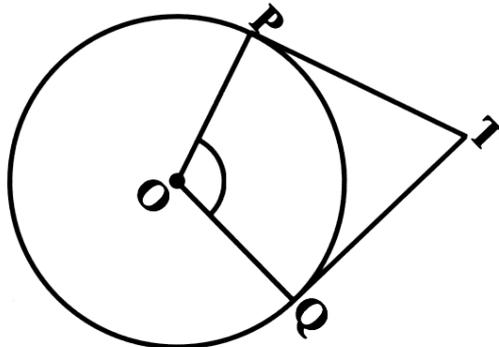
MAX. MARKS : 90
DURATION : 3 HRS

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.
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SECTION – A

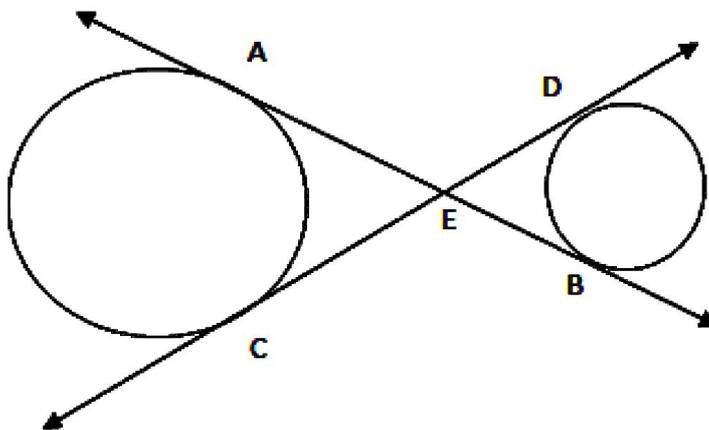
1. In the given figure TP and TQ are tangents to a circle with centre O. If $\angle PTQ = (2x + 3)$ and $\angle POQ = (3x + 7)$, then find the value of x



2. Find the 17th term from the end of the AP: 1, 6, 11, 16..... 211, 216
3. A letter is chosen at random from the letter of the word PROBABILITY. Find the probability that it is a not a vowel.
4. A pole 6 m high casts a shadow $2\sqrt{3}$ m long on the ground, then find the angle of elevation of the sun.

SECTION – B

5. In the given figure, common tangents AB and CD to the two circles intersect at E. Prove that $AB = CD$.

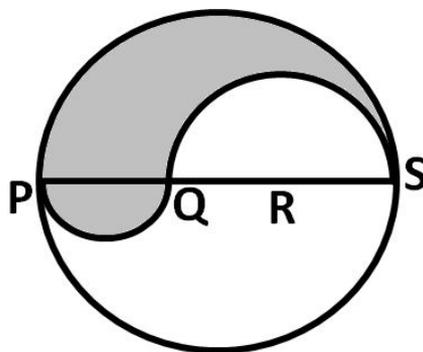


6. Find the sum of all natural numbers that are less than 100 and divisible by 4.

7. A circle is touching the side BC of $\triangle ABC$ at P and is touching AB and AC when produced at Q and R respectively. Prove that $AQ = \frac{1}{2}$ (Perimeter of $\triangle ABC$).
8. Find the value of p for which the points $(-1, 3)$, $(2, p)$ and $(5, -1)$ are collinear.
9. Find the value(s) of k , for which the equation $kx^2 - kx + 1 = 0$ has equal roots.
10. P and Q are the points with co-ordinates $(2, -1)$ and $(-3, 4)$. Find the co-ordinates of the point R such that PR is $\frac{2}{5}$ of PQ.

SECTION – C

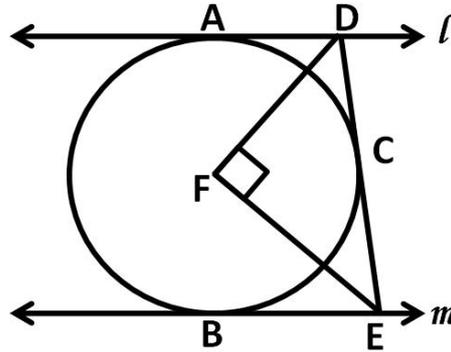
11. A cylindrical pipe has inner diameter of 4 cm and water flows through it at the rate of 20 meter per minute. How long would it take to fill a conical tank of radius 40 cm and depth 72cm?
12. PQRS is a diameter of a circle of radius 6 cm. The lengths PQ, QR and RS are equal. Semicircles are drawn on PQ and QS as diameters as shown in below figure. Find the perimeter and area of the shaded region.



13. Solve the given equation by the method of completing the squares: $x^2 + 12x - 45 = 0$
14. The sum of first six terms of an A.P. is 42. The ratio of its 10th term to its 30th term is 1:3. Find the first term of the A.P.
15. From the top of a lighthouse 75 m high, the angles of depression of two ships are observed to be 30° and 45° respectively. If one ship is directly behind the other on the same side of the lighthouse then find the distance between the two ships.
16. The vertices of a triangle are A $(-1, 3)$, B $(1, -1)$ and C $(5, 1)$. Find the length of the median through the vertex C.
17. The king, queen and jack of diamond are removed from a deck of 52 playing cards and then well shuffled. Now one card is drawn at random from the remaining cards. Determine the probability that the card drawn is : i) a face card. ii) a red card. iii) a king.
18. Find the area of the minor segment of a circle of radius 42cm, if the length of the corresponding arc is 44 cm.
19. Find the number of spherical lead shots, each of diameter 6 cm that can be made from a solid cuboid of lead having dimensions 24 cm x 22 cm x 12 cm.
20. A wooden souvenir is made by scooping out a hemisphere from each end of a solid cylinder. If the height of the cylinder is 10 cm and its base is of radius 3.5 cm then find the total cost of polishing the souvenir at the rate of Rs. 10 per cm^2 .

SECTION – D

21. In figure. l and m are two parallel tangents at A and B . The tangent at C makes an intercept DE between the tangent l and m . Prove that $\angle DFE = 90^\circ$



22. Solve the following quadratic equation by applying the quadratic formula:

$$p^2x^2 + (p^2 - q^2)x - q^2 = 0.$$

23. Draw a ΔABC with sides $BC = 5\text{cm}$, $AB = 6\text{cm}$ and $AC = 7\text{cm}$ and then construct a triangle similar to ΔABC whose sides are $\frac{4}{7}$ of the corresponding sides of ΔABC .
24. A train covers a distance of 90 kms at a uniform speed. It would have taken 30 minutes less if the speed had been 15 km/hr more. Calculate the original duration of the journey.
25. Cards marked with numbers 1, 3, 5... 49 are placed in a box and mixed thoroughly. One card is drawn from the box. Find the probability that the number on the card is (i) divisible by 3 (ii) a composite number (iii) Not a perfect square (iv) Multiple of 3 and 5.
26. The points $A(1, -2)$, $B(2, 3)$, $C(k, 2)$ and $D(-4, -3)$ are the vertices of a parallelogram. Find the value of k and the altitude of the parallelogram corresponding to the base AB .
27. From a point 100 m above a lake the angle of elevation of a stationary helicopter is 30° and the angle of depression of reflection of the helicopter in the lake is 60° . Find the height of the helicopter above the lake.
28. The radii of two concentric circles are 13 cm and 8 cm. AB is a diameter of the bigger circle and BD is tangent to the smaller circle touching it at D and intersecting the larger circle at P , on producing. Find the length of AP .
29. A manufacturer of TV sets produced 600 units in the 3rd year and 700 units in the 7th year. Assuming that, production increases uniformly by a fixed number of units every year. Find (i) The production in 1st year. (ii) The production in 10th year. (iii) The total production in 7 years.
30. 50 circular discs, each of radius 7cm and thickness 0.5cm are placed one above the other. Find the total surface area of the solid so formed. Find how much space will be left in a cubical box of side 25cm if the solid formed is placed inside it.
31. A donor agency ensures milk is supplied in containers, which are in the form of a frustum of a cone to be distributed to flood victims in a camp. The height of each frustum is 30 cm and the radii of whose lower and upper circular ends are 20 cm and 40 cm respectively. . If this milk is available at the rate of Rs.35 per litre and 880 litres of milk is needed daily for a camp. (a) Find how many milk containers are needed daily for the camp. (b) What daily cost will it put on the donor agency? (c) What value of the donor agency is depicted in this situation?
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