KENDRIYA VIDYALAYA GACHIBOWLI, HYDERABAD – 32

SAMPLE PAPER 05 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	-	6(3)	3(1)	8(2)	**17(6)**
Trigonometry Heights & Distances	1(1)	-	3(1)	4(1)	**08(3)**
Probability	1(1)	-	3(1)	4(1)	**08(3)**
Coordinate Geometry	1(1)	-	6(2)	4(1)	**11(4)**
Mensuration Areas related to Circles & Surface Areas and Volumes	-	2(1)	9(3)	12(3)	**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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SAMPLE PAPER 05 FOR SA – II (2016-17)

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 co-ordinates of any one point lying on the perpendicular bisector of line segment joining the points $\left(-\frac{1}{2}, 5\right)$ and $\left(\frac{11}{2}, 3\right)$

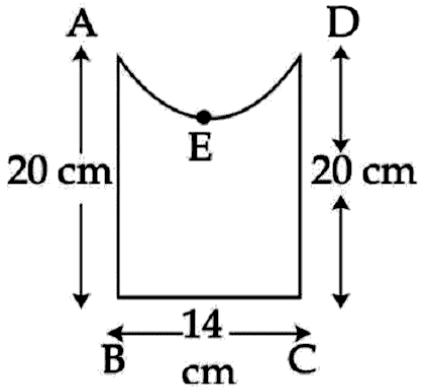
2. What is the probability that a leap year has 52 Sundays ?

3. An observer 1.2 metres tall is 28.2 m away from the tower. The angle of elevation of the top of the tower from his eye is 60^0. What is the height of the tower ?

4. Find the value of $\sqrt{6+\sqrt{6+\sqrt{6+.....}}}$.

SECTION – B

5. Find the perimeter of the given figure, where $\overset{\frown}{AED}$ is a semi-circle and ABCD is a rectangle. (Use $\pi = \frac{22}{7}$)



6. Divide a line segment AB of length 6 cm in the ratio 2 : 3 internally .

7. The seventeenth term of an A.P exceeds its 10^{th} term by 7. Find the common difference.

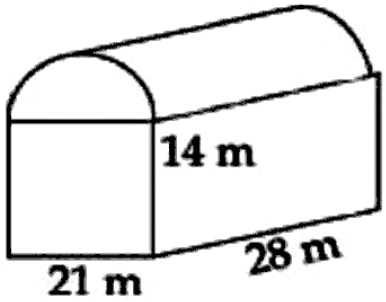
8. Is it possible to construct a pair of tangents from a point P to a circle of radius 4.5cm situated at a distance of 4cm from the centre ? If not, why ?

9. Find the nature of roots of the quadratic equation $2x^2 - 4x + 5 = 0$.

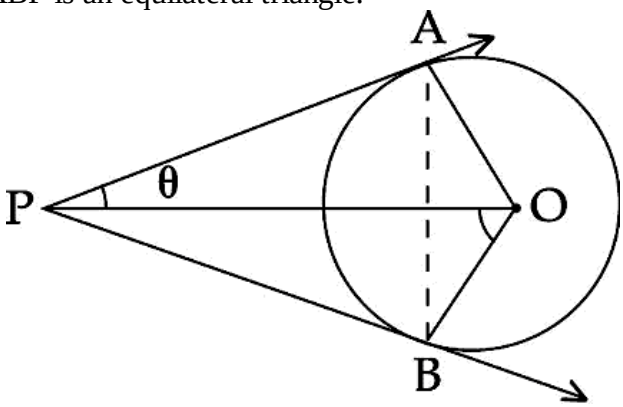
10. In two concentric circles, a chord of length 24 cm of larger circle becomes a tangent to the smaller circle whose radius is 5 cm. Find the radius of the larger circle.

SECTION – C

11. A godown is in the form of a cuboid having a semicylindrical roof-top. The measurements are as shown in the figure. Find the surface area of the building. (Use $\pi = 22/7$)



12. In the given figure, OP is equal to the diameter of a circle with centre O and PA and PB are tangents. Prove that ABP is an equilateral triangle.



13. The horizontal distance between two towers is 60 m. The angle of elevation of the top of the taller tower as seen from the top of the shorter one is 30°. If the height of the taller tower is 150 m, then find the height of the shorter tower.

14. A number x is chosen from –5, –4, –3, –2, –1, 0, 1, 2, 3. Find the probability that $|x| < 3$.

15. Find the area of the corresponding major sector of a circle of radius 28 cm and the central angle 45^0.

16. The diameter of a metallic sphere is 6 cm. The sphere is melted and drawn into long wire of uniform circular cross-section. If the length of wire is 36 cm, find its radius.

17. Find the first three terms of an increasing AP, wherein the sum of the first three terms is 42 and whose product is 2618.

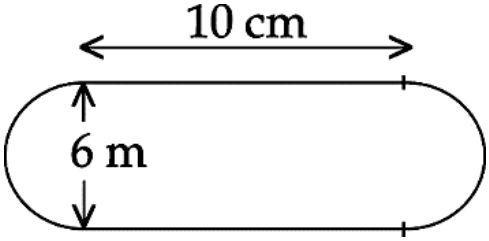
18. Divide 8 into two parts such that the sum of their reciprocals is $\frac{2}{3}$.

19. Show that quadrilateral PQRS formed by vertices P$(-2, 5)$, Q(7, 10), R(12, 11) and S$(3, -4)$ is not a parallelogram

20. The coordinates of the vertices of ΔABC are A(7, 2), B(9, 10) and C(1, 4). If E and F are the mid-points of AB and AC respectively, prove that $EF = \frac{1}{2}$ BC.

SECTION – D

21. An oval shaped meeting table, made of wood, has dimensions of its top as shown in the figure. Find the cost of polishing it at Rs. 5.75 per sq.m. $(\text{Use } \pi = 3.14)$.



22. The sum of first 30 terms of an AP is equal to the sum of its first 20 terms. Show that the sum of the first 50 terms of the same AP is zero.

23. Two tangents are drawn to a circle with centre O, from a point P. If OP is equal to the diameter of the circle, show that ΔAPB is equilateral.

24. Draw ΔABC such that BC=5 cm, $\angle ABC=60^0$ and $\angle ACB= 30^0$. Now construct $\Delta A'BC' \sim \Delta ABC$ with A'B **:** AB= 3 : 2.

25. A cylindrical vessel of diameter 14 cm and height 42 cm is fixed symmetrically inside another cylindrical vessel of diameter 16 cm and height 42 cm. The total space between the two vessels is filled with cork dust for heating insulation purpose. How many cubic centimetres of cork dust is required for the purpose ? (Use $\pi = 22/7$)

26. A farmer wants to dig a well either in the form of cuboid of dimensions 1 m $\times$ 1 m $\times$ 7m or in the form of a cylinder of diameter 1 metre and height 7 m. The rate to dig the well is ` 50 m per^3. Find the cost to dig both wells. The farmer decides to dig the cylindrical well. Why he has chosen cylindrical well?

27. From a point on the ground, the angles of elevation of the bottom and top of a water tank, kept at the top of 20 m high tower, are 45^0 and 60^0 respectively. Find the height of the water tank. Also, find the distance between the observation point on the ground and the base of the building.

28. A jar contains marbles of blue, white and red colours. The probability of selecting a blue marble is $\frac{4}{15}$ and the probability of selecting a white marble is $\frac{2}{5}$. If the jar contains 10 red marbles find the total number of marbles in the jar.

29. Find the area of a quadrilateral ABCD whose vertices are A(1, 0), B(5, 3), C(2, 7) and D(–2, 4). Also, find the lengths of the diagonals AC and BD.

30. Express $\left(\frac{4x-3}{2x+1}\right)-10\left(\frac{2x+1}{4x-3}\right)=3, \left(x \neq \frac{-1}{2}, x \neq \frac{3}{4}\right)$ in standard form and then find its roots by factorisation method.

31. Find the value of a, b and c such that the numbers a, 7, b, 23 and c are in A.P.