KENDRIYA VIDYALAYA SANGATHAN ERNAKULAM REGION
SAMPLE PAPER
SUMMATIVE ASSESSMENT   - II   2013-14
CLASS - X   SUBJECT MATHEMATICS

Time : 3 hours   **Max.Marks : 90**

General Instruction:

I.This question paper consists of 34 questions divided into four sections A,B,C and D . Section A comprises of 8 questions of 1 mark each, Section B comprises of 6 questions of 2 marks each, Section C comprises of 10 questions of 3 marks each and section D comprises of 10 questions of 4 marks each.

II. Questions of Section A are multiple choice questions, where only the correct option is to be selected.

III. There is no overall choice. However, internal choices have been provided. You have to attempt only one of the alternatives in all such questions.

<u>SECTION   A</u>

1.   For what value of k the following quadratic equation will have two equal roots $2x^2 + kx +3 =0$

 (a) $\pm 2\sqrt{6}$ (b) $3\sqrt{8}$ (c) 4 (d) 0

2.   The next term of the A.P $\sqrt{8}$, $\sqrt{18}$, $\sqrt{32}$,…. Is

 (a) $\sqrt{42}$ (b)$\sqrt{50}$ $(c)\sqrt{49}$ (d) $\sqrt{52}$

3.   PA is a tangent to a circle with centre O, from a point P. If ΔOPA is an isosceles   triangle then $\angle OPA\ is$

(a) 15^0 (b) 30^0 (c) 60^0 (d) 45^0

4.   A die is thrown once. The probability of getting a prime number is (a) $\frac{2}{3}$ (b) $\frac{1}{3}$ (c) $\frac{1}{2}$ (d) $\frac{1}{6}$

5. The point on X-axis which is equidistant from points (-1,0) and (5,0) is   (a)   (0, 2)   (b)   (2,0)   (c)   (3,0)   (d) (0,3)

6 A cylinder, a cone, and a hemisphere are of equal base and same height what is the ratio of their volumes.
a) 1:2:3   (b)   2:3:1   (c) 2:1:3 (d) 3:1:2

7. A ladder of 10 cm length touches a wall at a height of 5cm. The angle θ made by it with the horizontal is
(a) 90^0 (b) 60^0 (c) 45^0 (d) 30^0

8. If the points (7,-2) ,(5,1) and (3,k) are collinear, then the value of k is   (a) 4 (b) 10 (c)   (-4)   (d) 0
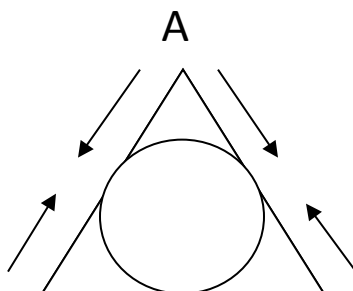
SECTION – B

9. Find the root of the following quadratic equation
$x + \dfrac{1}{x} = 3$ $(x \neq 0)$

10. Find the 11th term from the last term (towards the first term) of the A.P 10,7,4,…..,-62

11. In the following figure the circle is inscribed in $\triangle ABC$, find the value of x

A

18cm Q   R xcm

B 10cm P   6cm C

12. Find the ratio in which the Y axis divide the line segment joining the points (5, -6) and (-1,-4)

13. If the diameter of a semicircular protractor is 14cm, find its perimeter, $\pi = \dfrac{22}{7}$.

14. Two cubes each of volume 64cm^3 are joined end to end. Find the surface area of the resulting cuboid.

SECTION-C

15. If $a_n = 3 + 4n$, show that $a_1, a_2, a_3, a_4 \ldots\ldots a_n$, from an arithmetic progression . Also find the sum of first 25 terms.

16.The diagonal of a rectangular field is 60 metres more than the shorter side. If the longer side is 30 metres more than the shorter side , find the sides of the field.

17.Find the roots of the equation $5x^2 - 6x - 2 = 0$ by the method of completing the square.

18.Construct a triangle of sides 4cm, 5cm, and 6cm and then triangle similar to it whose sides are 2/3 of the corresponding sides of the first triangle

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

<div align="center">OR</div>

Prove that opposite sides of a quadrilateral circumscribing a circle subtend supplementary angle at the centre of the circle.

20. Honey goes to school either by a car driven by her driver or uses her bicycle. Probability that she uses the car is 3/7.
(a) what is the probability that she will use the bicycle for going to school.
(b) If you are her friend , what mode of transport you would suggest for her.
(c) Why would you ask her to opt that mode of transport.

21. A contract was made to construct a vertical pillar at a horizontal distance of 100m from a fixed point A was decided that angle of elevation of the top of the completed pillar from this point to be 60^0. The contractor finished the job by making pillar such that angle of elevation of its top was 45^0
(a) Find the height of the pillar to be increased as per the terms of the contract.
(b) Contractor demands for the full payment for the work (i) is it justified (ii) which value he is lacking.

22. A hemispherical bowl of internal diameter 36cm is full of some liquid, which is to be filled in cylindrical bottles of radius 3cm and height 6cm. Find the number of bottles needed to empty the bowl.

<div align="center">OR</div>

A 20cm deep well with diameters7m is dug and the earth from digging is evenly spread out to form a platform 22m by 14m. Find the height of the platform.

23.Prove that the points A (2,-1) B(3,4) , C (-2,3) and D (-3,-2) are the vertices of a rhombus ABCD. Is ABCD a square?

24. A toy is in the form of a cone mounted on a hemisphere of same radius 7cm. If the total height of the toy is 31cm, find its total surface area (π = $\frac{22}{7}$).

<div align="center">SECTION - D</div>

25.A train travels 360 Km at a uniform speed .If the speed had been 5 Km/h more it would have taken 1 hour less for the same journey. Find the speed of the train?

<div align="center">OR</div>

Two water taps together can fill a tank in $9\frac{3}{8}$ hours. The tap of larger diameter takes 10hours less than the smaller one, to fill the tank separately, find the time in which each tap can separately fill the tank.

26.Prove that the lengths of tangents drawn from an external point to a circle are equal.

27.A triangle ABC is drawn to circumscribe a circle of radius 4cm, such that the segments BD and DC in to which BC is

divided by the point of contact D are of lengths 8cm and 6cm respectively.

Find the sides AB and AC.

A

C ← 6cm → D ← 8cm → B
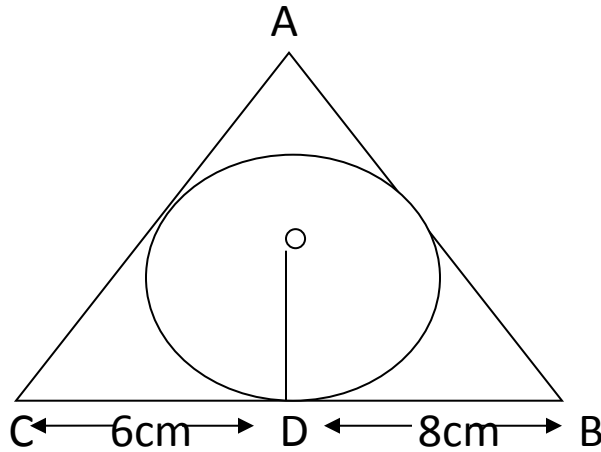
28. In a circular table cover of radius 32cm a design is formed leaving an equilateral triangle in the middle as shown in the figure. Find the area of the design.

A

B

C
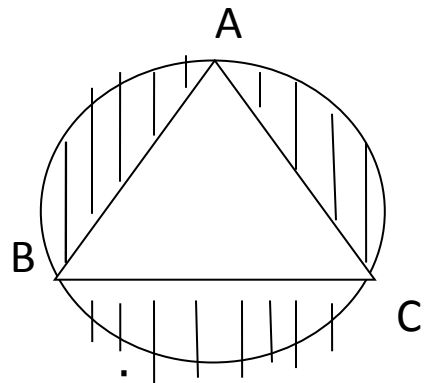
29. The angles of depression of the top and the bottom of a 8m tall building from the top of a multistoried building are 30^0 and 45^0 respectively. Find the height of the multistoried building and the distance between the two buildings.

30. A box contains 90discs which are numbered from 1 to 90. If one disc is drawn at random from the box , find the probability that it bears

(i) a perfect square number (ii) a two digit number (iii) a number divisible by 5 (iv) a three digit number.

31.If the points A (6,1) ,B (8,2) , C (9, 4) and D (p,3) are the vertices of a parallelogram, taken in order find the values of p.

32. A container opened from the top and made up of a metal sheet is in the form of a frustum of a cone of height 16cm with radii of its lower and upper ends as 8cm and 20cm respectively. Find the cost of the milk which can completely fill the container at the rate of Rs. 20 per litre.

OR

A container shaped like a right circular cylinder having diameter 12 cm and height 15 cm is full of ice cream. The ice cream is to be filled into cones of height 12 cm and diameter 6 cm, having a hemispherical shape on the top. Find the number of such cones which can be filled with ice cream.

33. A spiral is made up of successive semicircles, with centres alternately at A and B, starting with centre at A, of radii 0.5 cm, 1.0 cm, 1.5 cm, 2.0 cm, . . . as shown in figure. What is the total length of such a spiral made up of thirteen consecutive semicircles? (Take π = $\frac{22}{7}$)

L3

L1

A

B

L2
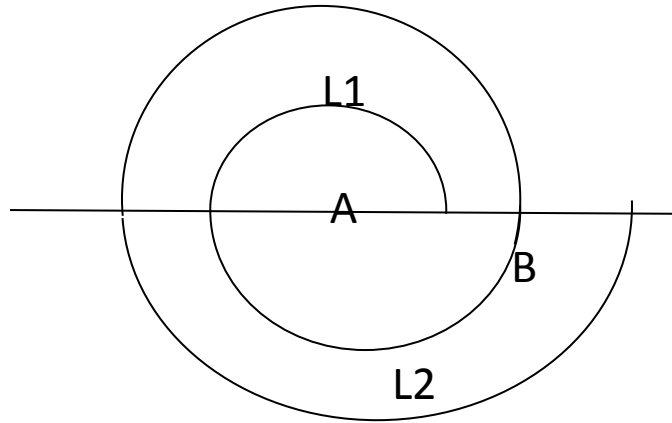
L4

34. A juice seller was serving his customers using glasses. The inner diameter of the cylindrical glass was 5 cm, but the bottom of the glass had a hemispherical raised portion which reduced the capacity of the glass. If the height of a glass was 10 cm, find (a)the apparent capacity of the glass and its actual capacity. (Use $\pi = 3.14$.)   (b) To earn more, the juice seller is using a particular type of glass. Is his action justified? What value is he lacking?