SUMMATIVE ASSESSMENT – II (2015-2016) 0OEJ4MP

MATHEMATICS Class – X

Time allowed : 3 hours **Maximum Marks : 90**

Question numbers 1 to 4 carry one mark each. **SECTION-A**

1 Find the 50^{th} term of an AP : $-9, -9, -9....$ 1

2 A man 1.5 m tall is 23.5 meters away from a tower of height 25 m. From his eyes, find the angle of elevation of the top of the tower. 1

3 Cards marked with numbers 5 to 75 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 even. 1

4 Find the ratio in which the line segment joining the points $(2, -3)$ and $(3, 1)$ is divided by x -axis. 1

Question numbers 5 to 10 carry two marks each. **SECTION-B**

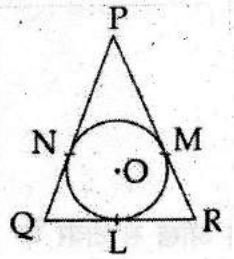
5 Find the roots of the following quadratic equation : $4x^2 - 4px + (p^2 - q^2) = 0$ 2

6 The seventeenth term of an A.P exceeds its 10^{th} term by 7. Find the common difference. 2

7 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. 2

8 Draw a circle of radius 3.5 cm. From a point 6 cm away from its centre, Construct two tangents to the circle. 2

9 In the figure, if PQ = PR, prove that QL = RL 2



10 The difference between the circumference and the diameter of a circle is 30 cm. Find the radius of the circle $\left(\text{Use } \pi = \frac{22}{7}\right)$ 2

Question numbers 11 to 20 carry 3 marks each. **SECTION-C**

11 Find the values of k for which the quadratic equation $(k-2)x^2 + 2(2k-3)x + (5k-6) = 0$ has equal roots. 3

12 The sum of n terms of a sequence is $3n^2 + 4n$. Find the n^{th} term and show that the sequence is A.P. 3

13 Construct a right triangle XYZ in which XY = 5 cm, YZ = 12 cm and $\angle Y = 90°$. Construct a triangle of similar to it and of factor $\frac{4}{5}$. 3

14 A tree 12 m high, is broken by the wind in such a way that its top touches the ground and makes an angle 60° with the ground. At what height from the bottom the tree is broken by the wind ? 3

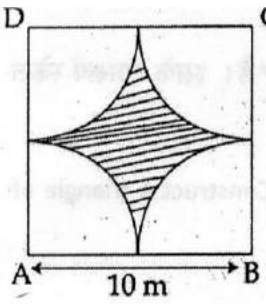
15 A box is containing 55 flash cards showing different numbers on it. If a card is picked up at random from the box, the probability of getting an even number is $\frac{1}{11}$.

How many cards have odd numbers written on it ? 3

16 A(0, 0), B(6, −2) and C(8, −4) are the three vertices of a parallelogram ABCD. If E is the mid-point of DC, find the area of ΔADE. 3

17 If (1, 5), (p, 1) and (4, 11) are collinear, find the value of p. 3

18 A flower bed is laid in a square park of side 10 m as shown (shaded) in the figure. Find the area of flower bed, if the portions left out are the quadrants of a circle of same radius. The diameter of the circle is equal to side of square. 3



19 Find the number of coins 1.5 cm in diameter and 0.2 cm thick to be melted to form a right circular cylinder whose height is 10 cm and diameter is 4.5 cm. 3

20 Find the mass of a solid cone of silver metal having base diameter 14 cm and vertical height 51 cm. The density of silver is 10 g/cm^3. (Use $\pi = \frac{22}{7}$) 3

Question numbers 21 to 31 carry 4 marks each. **SECTION-D**

21 Varun takes 6 days less than the time taken by Sachin to finish a piece of work. If both Varun and Sachin together can finish it in 4 days, find the time taken by Sachin to finish the work. 4

22 Find the sum of the integers between 100 and 200 that are 4
(i) divisible by 6. (ii) not divisible by 6.

23 If the roots of the equation $(a^2+b^2)x^2-2(ac+bd)x+(c^2+d^2)=0$ are equal, then prove that $\frac{a}{b}=\frac{c}{d}$. 4

24 Prove that the opposite sides of a quadrilateral circumscribing a circle, subtend supplementary angles at the centre of the circle. 4

25 Construct a ΔABC in which BC = 5 cm, CA = 6 cm and AB = 7 cm. Construct another triangle A'B'C' each of whose sides are $\frac{7}{5}$ times the corresponding sides of ΔABC. 4

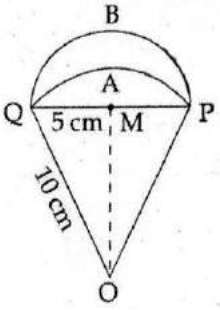
26 A person standing on the bank of a river observes that the angle of elevation of the top of a tree on the opposite bank is 60°. When he retires 40 metres from the bank, he finds the angle of elevation to be 30°. Find the width of the river. 4

27 All kings are removed from a deck of 52 playing cards and then well shuffled. One card is selected from the remaining cards. Find the probability of getting 4
(A) a spade. (B) a queen.
(C) a black card. (D) a red ace.

28 The co-ordinates of the vertices of a quadrilateral ABCD are A (0, 5), B (–2, –2), C(5, 0) and D(7, 7). Prove that the quadrilateral ABCD is a rhombus. 4

29 A manufacturer involves twelve children in colouring pen stands all over excluding base which are in the shape of a cylinder made of wood of thickness 2 cm. The inner radius of the cylinder is 4 cm and its height is 14 cm. Find the area they had to paint if 50 pen stands were given to them for painting. 4
What type of social problem is depicted in the question nad measure you will suggest to abolish it ?

30 In the given figure, arc A is a part of the circle with centre O and radius OP and M is the mid-point of QP.
Arc B is a part of a circle with centre M and radius PM. Find the area enclosed between the two arcs A and B. (Take $\sqrt{3} = 1.73$ and $\pi = \frac{22}{7}$)



31 A hollow cone is cut by a plane parallel to the base and the upper portion is removed. If the curved surface area of the remainder is $\frac{16}{25}$ of the curved surface area of the whole cone, find the ratio of the line-segments into which the cone's height is divided by the plane. 4