Class- X

Mathematics

Course Structure   *2nd Term*

S.No	Units	Marks
1.	Algebra	23
2.	Geometry	17
3.	Trigonometry	08
4.	Probability	08
5.	Co-ordinate Geometry	11
6.	Mensuration	23
Total		**90**

Mathematics X
Blue Print (Mathematics)
Summative Assessment II

S.No	Units	MCQ	SA I	SA II	LA	Total Marks
1	Algebra	1(1)	4(2)	6(2)	12(3)	23(8)
2	Geometry	3(3)	4(2)	6(2)	4(1)	17(8)
3	Trigonometry	1(1)	4(2)	6(2)	12(3)	23(8)
4	Probability	1(1)	-	3(1)	4(1)	8(3)
5	Co-ordinate Geometry	1(1)	-	6(2)	4(1)	11(4)
6	Mensuration	1(1)	-	3(1)	4(1)	8(3)
Total		**8(8)**	**12(6)**	**30(10)**	**40(10)**	**90(34)**

Class- X

Summative Assessment II

Time: 3 to 3 ½ hrs   **Max Marks: 90**

General Instructions:

1. All questions are compulsory.
2. The 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.
   Section- D comprises of 10 questions of 4 marks each.
3. Question numbers 1 to 8 in section A are multiple choice questions where you are to select one correct option out of given four.
4. There is no overall choice. However internal choice has been provided in 1 question of 2 marks, 3 questions of 3 marks and 2 questions of 4 marks each. You have to attempt only one of the alternatives in all such questions.
5. Use of Calculator is not permitted.
6. An additional 15 minutes time has been allotted to read this question paper only.

Section- 'A'

Q1. Which of the following is not a root of a quadratic equation $x^2-(\sqrt{2}+1)x+\sqrt{2}=0$?

(a) $\sqrt{2}$ (b) 1   (c) -1   (d) none of these

Q2. A tangent PQ at a point A of a circle of radius 5 cm meets a line through the centre O at a point Q so that OQ=12 cm, then the length of AQ is

(a) 12 cm   (b) 13 cm   (c) 8.5 cm   (d) $\sqrt{119}\ cm$

Q3. The perimeter of a quadrant of radius 'r' is

(a) $\frac{\pi r}{2}$ (b) $2\pi r$ (c) $\frac{1}{2}(\pi+4)r$ (d) $2\pi r+\frac{r}{2}$

Q4. When the sun is 30^0 above the horizontal the length of shadow cast by 50m building is

(a) $\frac{50}{\sqrt{3}}m$ (b) $50\sqrt{3}\ m$ (c) $25\sqrt{3}\ m$ (d) none of these

Q5. A die is thrown twice, the probability that two m not come up either time is

(a) $\frac{1}{6}$ (b) $\frac{5}{6}$ (c) $\frac{51}{52}$ (d) none of these

Q6. To draw a pair of tangents to a circle which are inclined to each, other at an angle of 60^0, it is required to draw tangents at end points of those two radii of the circle, the angle between then should be

   (a) 135^0 (b) 90^0 (c) 60^0 (d) 120^0

Q7. A line 'm' is tangent to a circle wih radius 5 cm. Distance between the centree of the circle and the line m is

   (a) 3 cm   (b) 4 cm   (c) 5 cm   (d) 6 cm

Q8. The points (k+1, 1) , (2k+1, 3) and (2k+2, 2k) are collinear if

   (a) K=-1,2   (b) k=1/2, 2   (c) k=2,1   (d) k=-1/2, 2

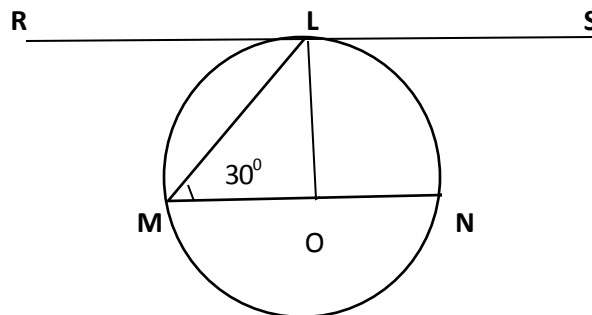## Section: B

Question numbers 9 to 14 are of 2 marks each.

Q9. Find the value of K, if (2k+1), 13 and 5k-3 are three consecutive terms of an AP.

Or

If the numbers x-2, 4x-1 and 5x+2 are in A.P, find the value of x.

**Q10.** Find the value of m if one root of the equation $2x^2$-8x-m=0 is 5/2

Q11. In figure RS is a tangent to the circle at L and MN is a diameter. If $\angle NML$=30^0. Determine $\angle$RLM.

Q12. A circle is inscribed in a △ABC touching BC, CA and AB at D, E and F respectively. If AB=10cm, AE=7cm, EC=5cm, then find the length of BC

Q13. How many spherical lead shots each having diameter 3 cm can be made from cuboidal lead solid of diamensions 9cm x 11cm x 12 cm ?

Q14. In the given figure, a circle of radius 7 cm is inscribed in a square. Find the area of the shaded region [use $\pi = \frac{22}{7}$]
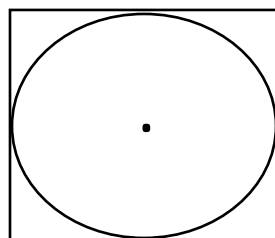
Section:- C

Q15. Find the roots of the equation:

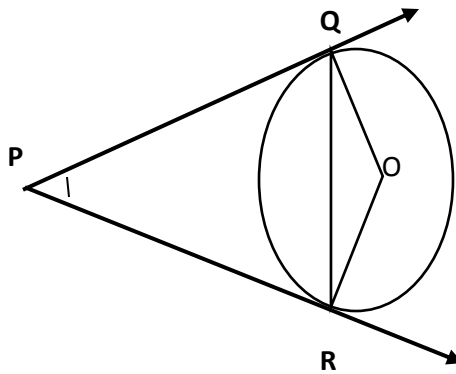$$\frac{1}{2x-3} + \frac{1}{x-5} = 1, \qquad x \neq \frac{3}{2}, 5$$

Or

A natural number, when increased by 12 becomes equal to 160 times its reciprocal. Find the number.

Q16. Find the sum of integers between 100 and 200 that are divisible by 9.

Q17. In figure, two tangents PQ and PR are drawn to a circle with centre O from an external point P.
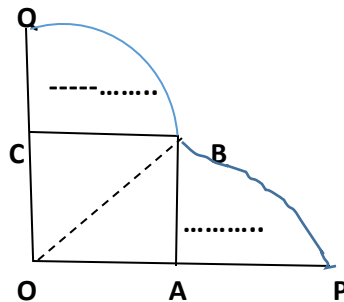
Prove that $\angle QPR = 2 \angle OQR$

Or

Prove that the parallelogram circumscribing a circle is rhombus.

Q18. Construct a triangle ABC with side BC=6 cm, AB= 5cm and $\angle ABC$=60^0. Then construct a triangle whose sides are ¾ times the corresponding sides of △ABC.

Q19. In figure, OABC is a square inscribed in a quadrant OPBQ. If OA= 20cm, find the area of the shaded region(use $\pi = 3.14$)

Q20. A hemispherical depression is cut out from one face of a cubical wooden block such that the diameter l of the hemisphere is equal to the edge of a cube. Determine the surface area of the remaining solid.

<center>**Or**</center>

A copper rod of diameter 1 cm and length 8 cm is drawn into a wire of length 18 cm of uniform thickness. Find the thickness of the wire.

Q21. A tower stands vertically on the ground from a point on the ground which is 20 m away from the foot of the tower, the angle of elevation of the top of the tower is found to be 60^0. Find the height of the tower.

Q22. Prove that the points A(4,3), B(6,4), C(5,-6) and B(3,-7) in that order are vertices of a parallelogram.

Q23. The points A(2,9), B(a,5), C(5,5) are the vertices of a triangle ABC, right angled at B. Find the value of a and hence, the area of $\triangle ABC$

Q24. Cards with numbers 2 to 101 are placed in a box. A card is selected at random from the box. Find the probability that the card which is selected has a number which is a Perfect square.

<center>**Section D**</center>

Question numbers 25 to 34 carry 4 marks each.

Q25. A peacock in sitting on the top of a pillar which is 9m high. From a point 27m away from the bottom of the pillar, a snake is coming to its hole at the base of the pillar. Seeing the snake the peacock pounces on it. If their speeds are equal at what distance from the hole is the snake caught ?

Q26. From the top of a 7 m high building, the angle of elevation of the top of a cable tower is 60^0 and the angle of depression of its foot is 45^0. Determine the height of the tower.

Q27. If the 9th term of an AP is zero. Then prove that 29th term is double of 19th term.

<center>**Or**</center>

Find the sum of first 15th term of an AP of which t_n= 3+4x.

Q28 Find two consecutive odd positive integers, sum of whose squares is 290.

Q29 Prove that the lengths of tangents drawn from an external point to a circle are equal.

Q30. From a pack of 52 playing cards, jacks, kings, aces of red colour removed. From the remaining a card is drawn at random. Find the probability that card is drawn is (i) a black queen

(ii) a red card   (iii) a black jack   and (iv) a picture card.

Q31. Find the lengths of the medians of the triangle whose vertices are(1, -1); (0,4); and (-5,3)

Q32. A car has wheels which are 80 cm in diameter. How many complete revolutions does each wheel make in 10 minutes. When the car is travelling at a speed of 66 km per hour?

Q33. If the radii of the ends of a bucket, 45 cm high are 28 cm and 7 cm. Find the capacity and the lateral surface area of the bucket. [use $\pi = \frac{22}{7}$]

Q34. How many silver coins 1.75 cm in diameter and of thickness 2 mm, must be melted to form a cuboid of dimensions 5.5 cm x 10 cmx 3.5 cm ?

Or

A cone of height of 24 cm and radius of base 6 cm is made up of modelling clay. A child reshapes it in in the form of a sphere. Find the radius of the sphere.