Sample Paper – 2010 **Subject – Maths** **Class – X**

Time : 3 Hr. **M.M. : 80**

General instructions:-

1. All Questions are compulsory.
2. The question paper consists of 30 questions divided into 4 sections A, B, C, and D. Section A comprises of 10 questions of 01 marks each, section B comprises of 5 questions of 02 marks each, section C comprises of 10 questions of 03 marks each, and section D comprises of 5 question of 06 marks
3. All questions in section A are to be answered in one word, one sentence or as per the exact requirement of the question.
4. There is no overall choice. However internal choice has been provided in one question of 02 marks each, three questions of 03 marks each and one question of 06 marks each. You have to attempt only one of the alternatives in all such questions.
5. Uses of calculators are not permitted. However you may ask for mathematical tables.

SECTION –A

1. State Euclid's Division Lemma with suitable example.
2. For what value of "p" does the given quadratic equation has real roots : $4x^2 - 3px + 9 = 0$.
3. For what value of k, the given equation has unique solutions: $3x - y - 5 = 0$, $6x - 2y + k = 0$.
4. Find a quadratic polynomial whose zeroes are $3 + \sqrt{1.04}$ and $3 - \sqrt{1.04}$.
5. If the sum of first n terms of an A.P is $3n^2 - 2n$, find the A.P and its 19^{th} term.
6. Find x if mean of the following data is 19 : 15, 20, 25, 18, 14, 15, 25, 15, 18, 16, 20, x, 18.
7. A circle touches the sides BC, CA and AB of a ΔABC at D, E and F respectively. If AB = AC. Prove that BD = CD.
8. A metallic sphere of radius 4.2 cm is melted and recast into a shape of a cylinder of radius 6 cm. Find the height of the cylinder.
9. In ΔABC, if $DE \| BC$, AD = x, DB = x – 2, AE = x + 2 and EC = x – 1, then find the value of x.
10. Find the perimeter of a sector of a circle with diameter 8cm if angle of the sector is 36^0.

Section – B

11. How many term of an A.P. – 10 , - 7 , - 4 ….. must be added to get the sum 104.
12. If sin 3 A = cos (A – 6°), where 3 A and (A – 6°) are acute angles then find value of A and Cosec A.
13. Places A and B are 80 km apart from each other on a highway. A car starts from A and another starts from B at the same time. If they move n the same direction, they meet in 8 hours and if they move in opposite directions they meet in 1 hour and 20 minutes. Find the speed of the car.
14. The diagonals of a quadrilateral ABCD intersect each other at the point O such that $\frac{AO}{BO} = \frac{CO}{DO}$. Show that ABCD is a trapezium.
15. If (- 2 , - 1); (a, 0); (4, b) and (1, 2) are the vertices of a parallelogram, find the value of a and b.

SECTION –C

16. Solve the following system of linear equation graphically : $2x + y + 6 = 0$, $3x - 2y - 12 = 0$.
    Also, find the vertices of the triangle formed by the lines representing the above equations and x – axis.

17. The third term of an A.P is 7 and the seventh term exceeds three times the third term by 2. Find the first term, the common difference and the sum of first 20 terms.
18. For what value of k, $[4-k]\,x^2 + [2k+4]x + [8k+1] = 0$ is a perfect square.
19. Find the area of the quadrilateral whose vertices, are in order (-4, -2), (-3, -5), (3, -2) and (2, 3).
20. Prove the following identity: $\dfrac{\tan\theta + \sec\theta - 1}{\tan\theta - \sec\theta + 1} = \dfrac{1 + \sin\theta}{\cos\theta}$

21. PA and PB are tangents from P to the circle with centre O. LN touches the circle at M, then show that PL + LM = PN + NM.
22. Find the value of k so that the points A(- 2 , 3), B (4, - 1) and C (5, k) be collinear.
23. In ΔABC , right angled at A, if AD perpendicular to BC prove that $AB^2 + CD^2 = BD^2 + AC^2$.
24. Construct ΔABC in which AB = 4 cm, angle B = 120 and BC = 5 cm. Construct another triangle AB`C` Similar to ΔABC such that AB` = 5/4 AB.
25. Four equal circles are described about the four corners of a square so that each touches two of the other. Find the area of shaded region not including the circle, if each side of a square measuring 14 cm.

SECTION –D

26. A plane left 30 minutes later than the scheduled time and in order to reach its destination 1500 km away in time it has to increase its speed by 250 km/hr from its usual speed. Find its usual speed.
27. An aero plane flying horizontally at a height of 2500m above the ground is observed at an elevation of 60^0 . If after 15 seconds, the angle of elevation is observed to be 30^0, find the speed of the aero plane in km/hr.
28. State and prove converse of Pythagoras Theorem and hence show that in an isosceles triangle ABC with AC = BC and $AB^2 = 2\,AC^2$, prove that $\angle ACB = 90^0$.
29. (a) Water in a canal 30 dm wide and 12 dm deep is flowing with a velocity of 20 km/hr. How much area will it irrigate in 30 min if 9 cm of standing water is desired ?

    (b) A well with 10 m inside diameter is dug 14 m deep. Earth taken out of it and spread all around to a width of 5 m to form an embankment. Find the height of embankment.

30. The following table gives production yield per hectare of wheat of 100 farms of a village.

Prod. Yield (in kg/ha)	50 - 55	55 - 60	60 - 65	65 – 70	70 – 75	75 - 80
No. of forms	2	8	12	24	38	16

Change the distribution to a more than type distribution and draw its ogive.