Sample Paper – 2013

Class – X,

Subject – MATHEMATICS

 **TIME – 3 HOURS MAX. MARKS – 90**

 **General instructions:-**

* All question are compulsory.
* The question paper consists of 34 questions divided into four sections A, B, C and D. Section – A comprises of 8 question of 1mark 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.
* Question numbers 1 to 8 in Section – A are multiple choice questions where you are to select one correct option out of the given four.
* There is no overall choice. However, internal choice has been provided in 1 question of two marks, 3 questions of three marks each and 2 questions of four marks each. You have to attempt only one lf the alternatives in all such questions.
* Use of calculator is not permitted.
* An additional 15 minutes time has been allotted to read this question paper only.

**SECTION – A**

1. If the product of roots of the equation ax2 + bx + c = 0 is unity, then
2. The 20th term from the last term of the AP : 3, 8, 13, . . ., 253, is
3. 158
4. 160
5. 20
6. 148
7. Centroid of triangle whose vertices are is
8. (0, 2)
9. (0, 3)
10. (1, 3)
11. (1, 2)
12. If tangents PA and PB from a point P to a circle with centre O are inclined to each other an angle of 80, then ∠POA is equal to

a. 500

b. 600

c. 700

d. 800

1. A ladder of 10m length touches a wall at a height of 5 m. The angle made by it with the horizontal is:
2. 900
3. 1600
4. 450
5. 300
6. The probability that a leap year has 53 Sundays is
7. The area of the square that can be inscribed in a circle of radius 8 cm is
8. 256cm2
9. 128cm2
10. cm2
11. cm2
12. The ratio between the volumes of two spheres is 8 : 27. What is the ratio between their surface areas?
13. 2 : 3
14. 4 : 5
15. 5 : 6
16. 4 : 9

**SECTION – B**

1. Use factorization method to solve: .
2. How many three digit numbers are divisible by 7?
3. Find the value of k if the points A(k+1, 2k), B(3k, 2k+3) and C (5k – 1, 5k) are collinear.
4. Prove that the perpendicular at the point of contact to the tangent to a circle passes through the centre.
5. The difference between circumference and diameter of a circle is 135 cm. find the radius of the circle.
6. A cone of height 24 cm and radius of base 6 cm is made up of modeling clay. A child reshapes it in the form of a sphere. Find the radius of the sphere.

**SECTION – C**

1. The product of two consecutive positive integers is 306. Find the integers.
2. Find the roots of 4x2 + x – 5 = 0 by the method of completing the square.

or

The sum of the 4th and 8th terms of an AP is 24 and the sum of the 6th and 10th terms is 44. Find the first three terms of the AP.

1. In a potato race, a bucket is placed at the starting point, which is 5 m from the first potato and other potatoes are placed 3 m apart in a straight line. There are ten potatoes in the line.



A competitor starts from the bucket, picks up the nearest potato, runs back with it, drops it in the bucket, runs back to pick up the next potato, runs to the bucket to drop it in, and she continues in the same way until all the potatoes are in the bucket. What is the total distance the competitor has to run?

1. Draw a pair of tangents from a point 5cm away from the centre of a circle of radius 2 cm and measure their lengths.
2. Construct an isosceles triangle whose base is 8 cm and altitude 4 cm and then another triangle whose side are times the corresponding sides of the isosceles triangle.
3. From a point P on the ground the angle of elevation of the top of a 10 m tall building is 30°. A flag is hoisted at the top of the building and the angle of elevation of the top of the flagstaff from P is 45°. Find the length of the flagstaff and the distance of the building from the point P. (You may take 3 = 1.732)
4. A bag contains 12 balls out of which x are black.
5. If one ball is drawn at random, what is the probability that it will be a black ball?
6. If 6 more ball black balls are put in the bag, the probability of drawing a black ball will be double that in (a). Find x.
7. The cost of fencing a circular field at the rate of Rs 24 per metre is Rs 5280. The field is to be ploughed at the rate of Rs 0.50 per m2. Find the cost of ploughing the field.
8. In the given figure, OACB is a quadrant of circle with centre O and radius 3.5 cm. If OD = 2 cm, find the area of the

(i) Quadrant OACB

(ii) Shaded region. [use = 22/7]



1. The radii of the ends of a frustum of a cone 45 cm high are 28 cm and 7 cm. Find its volume, the curved surface area and the total suface area.

**SECTION – D**

1. Two water taps together can fill a tank in hours. The tap of larger diameter takes 10 hours less than the smaller one to fill the tank separately. Find the time in which each tap can separately fill the tank.
2. Which term of the A.P. 121, 117, 113 … is its first negative term?
3. Let be two points and P (x, y) divide AB in the ratio m : n. Derive formula for point P.

( Derive section formula.).

1. Show that the points (1, 7), (4, 2), (–1, –1) and (– 4, 4) are the vertices of a square.
2. A triangle ABC is drawn to circumscribe a circle of radius 4 cm such that the segments BD and DC into which BC is divided by the point of contact D are of lengths 8 cm and 6 cm respectively (see given figure). Find the sides AB and AC.



1. PQ is a chord of length 8 cm of a circle of radius 5 cm. The tangents at P and Q intersect at a point T. Find the length TP.



1. Find the probability that a number selected at random from numbers 1,2,3, - - - - , 35 is a
2. Prime number.
3. Multiple of 7
4. Multiple of 3 or 5.
5. A straight highway leads to the foot of a tower. A man standing at the top of the tower observes a car as an angle of depression of 30°, which is approaching the foot of the tower with a uniform speed. Six seconds later, the angle of depression of the car is found to be 60°. Find the time taken by the car to reach the foot of the tower from this point.
6. Find the area of the shaded design in Fig., where ABCD is a square of side 10 cm and semicircles ar e drawn with each side of the square as diameter. (Use = 3.14)

1. A solid toy is in the form of a hemisphere surmounted by a right circular cone. The height of the cone is 2 cm and the diameter of the base is 4 cm. Determine the volume of the toy. If a right circular cylinder circumscribes the toy, find the difference of the volumes of the cylinder and the toy.

**Answers**

1. A
2. A
3. B
4. A
5. D
6. B
7. B
8. D
9. 128
10. 2, ½
11. 31.5 cm
12. 6 cm.
13. 17 and 18
14. Or .
15. 370 m
16. 4.6 cm (approx.)
17. 7.32m and 17.32m
18. Rs. 1925
19. 48510 cm3, 5461.5 cm2, 8079.5 cm2
20. 25 hours, 15 hours.
21. 32nd term
22. 15 cm and 17 cm.
23. 20/3 cm
24. 3 seconds
25. 57 cm2.
26. 25.12 cm2, difference = 25.12 cm2.

K.P.CLASSES