SAMPLE PAPER – 2009
CLASS – IX
SUBJECT – MATHEMATICS

Time:3hrs **Max.Marks:80**

General Instructions

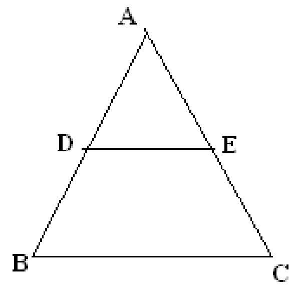
1. All questions compulsory
2. The question paper consist of thirty questions divided in to 4 sections A,B,C and D. Section A comprises of ten questions of 1 marks each ,Section B comprises of five questions of 2 marks each, Section C comprises of ten questions of 3 marks each and section D comprises of five questions of 6 marks each
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 2 marks each ,three question of three marks each and two questions of 6 marks each .You have to attempt only one of the alternatives in all such questions.
5. In question on construction ,drawings should be neat and exactly as per the given measurements
6. Use of calculators is not permitted .However you may ask for mathematical tables

SECTION A

1. State the Euclid's Division Lemma.
2. Find the condition that if the linear equations $lx + my = n$ and $ax + by = c$ have unique solution.
3. For the polynomial $3x^2 - 5x + 1$, what is the sum of zeros?
4. How many terms of the AP $-6, -\frac{11}{2}, -5.......$ will give the sum zero
5. If the mean of n observations $x_1, x_2, x_3.......x_n$ is $\bar{x}$ then find $(x_1 - \bar{x}) + (x_2 - \bar{x}) + (x_3 - \bar{x}).....(x_n - \bar{x})$
6. One letter is selected at random from the word 'UNNECESSARY'. Find the probability of selecting an E
7. Evaluate $\dfrac{2\tan 30^0}{1 - \tan^2 30^0} = ?$

8. The lengths of two cylinders are in the ratio 3:1 and their diameters are in the ratio 1:2 .Calculate the ratio of their volumes

9. In the given figure DE is parallel to BC and $AD:DB=2:3$ determine $ar(\Delta ADE):ar(\Delta ABC)$



10. A point P is 13 cm from the centre of a circle. If the radius of the circle is 5 cm,
then the length of the tangent drawn from P to the circle is:

SECTION B

11. If the zeroes of the polynomial x3 – 3x2 + x + 1 are a – b, a, a + b, find a and b.

12. 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.

13. Consider ΔACB, right-angled at C, in which AB: AC = $\sqrt{2}:1$. Find $\angle$ABC and also determine the values of $\cos^2 B+\sin^2 B$

14. Find the coordinates of the point P on y-axis, equidistant from two points A(-3,4) and B(3,6) on the same plane.

15. Cards numbered 3, 4, 5, 6, ------ 17 are put in a box and mixed thoroughly. A card is drawn at random from the box. Find the probability that the card drawn bears i)An even perfect square number, ii) A number divisible by 3 or 5.

SECTION C

16. Use Euclid's division lemma to show that the square of any positive integer is either of the form 3m or 3m + 1 for some integer m.

17. Solve the following system of linear equation graphically

    2x-3y=5

    3x+4y+1=0

    .Calculate the area bounded by these lines and y-axis

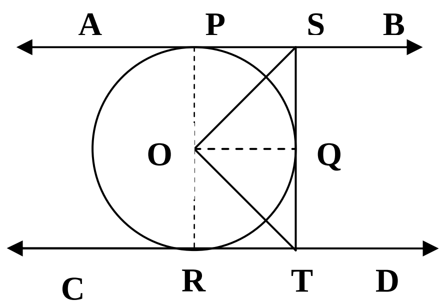
18. Divide $3x^2 - x^3 - 3x + 5$ by $x - 1 - x^2$, and verify the division algorithm.

19. Find the sum of all three digit numbers each of which leave the remainder 3 when divided by 5

OR

How many terms of the AP 78,71, 64 …… are needed to give the sum 468? Also find the last term of this AP

20. In the fig AB and CD are two parallel tangents touching the circle at Q. Show that $\angle$SOT=90^0



21. Draw a circle of radius 3.5 cm. Take a point outside the circle. Construct the pair of tangents from this point to the circle without using its centre. Measure the length of tangents.

22. Prove the following identity:

$$\frac{\cot\theta + \text{cosec}\theta - 1}{\cot\theta - \text{cosec}\theta + 1} = \frac{1 + \cos\theta}{\sin\theta}$$

OR

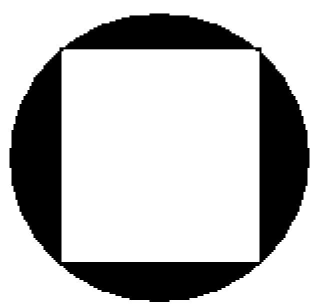
Evaluate without using tables

$$\cot\theta\tan(90^\circ-\theta)-\sec(90^\circ-\theta)\,\text{cosec}\,\theta+\sin^2 25^\circ+\sin^2 65^\circ$$
$$+\sqrt{3}(\tan 5^\circ\tan 45^\circ\tan 85^\circ)$$

23. Show that the points (0, 1), (2, 3), (6, 7) and (8, 3) are the vertices of a rectangle.

24. Find the co-ordinates of the points of trisection of the line segment joining the points (3, -3) and (6, 9).

25. A square ABCD is inscribed in a circle of radius 10 units .Find the area of the circle, not included in the square (use $\pi = 3.14$)



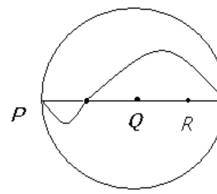
SECTION D

26. Abdul traveled 300 Km by train and 200 Km by taxi, it took him 5 hous 30 minutes. But if he travels 260 Km by train and 240 Km by taxi, he takes 6 minutes longer. Find the speed of the train and that of the taxi.

OR

Two pipes running together can fill a cistern in 2 8/11 minutes. If one pipe takes 1 minute more than the other to fill the cistern, find the time in which each pipe would fill the cistern.

27. If the radii of the ends of a bucket,45 cm high, are 28 cm and 7 cm, find the capacity and surface area.



28. The ratio of areas of similar triangles is equal to the ratio of the squares on the corresponding sides. Prove.
Using the above theorem, prove that the area of the equilateral triangle described on the side of a square is half the area of the equilateral triangle described on the diagonal.

29. Prove that in a right triangle , the square of the hypotenuse is equal to the sum of the squares of the other two sides
Using the above solve the following
L and M are the mid points of AB and BC respectively of ΔABC , right angled at B prove that $4LC^2 = AB^2 + 4BC^2$

30. A building is in the form of a cylinder surmounted by a hemispherical vaulted dome ,the building contains 17.7 m^3 of air and its internal diameter is equal to the height of the cylindrical part find the height of the building (use $\pi = \frac{22}{7}$)