SHREE RADHEY COACHING CENTER

TEST SERIES 1

CLASS 10 - MATHEMATICS
MATHS TEST 1

Time Allowed: 3 hours   **Maximum Marks: 80**

Section A

1. Show that there is no value of n for which $\left(2^n \times 5^n\right)$ ends in 5. **[1]**

2. If a and b are two positive integers such that a = bq + r. Where q and r are unique integers. a < **[1]** b, then find the value of q.

3. Show that 23.123456789 is rational. What can you say about the prime factors of their **[1]** denominators?

4. What can you say about the prime factorisations of the denominators of **[1]** 0.120120012000120000.... rational.

5. The number of zeroes of a cubic polynomial is **[1]**

    a) at most 3   b) 3

    c) at least 3   d) 2

6. Given that one of the zeroes of the quadratic polynomial $ax^2 + bx + c$ is zero, then the other **[1]** zero is

    a) $\frac{-b}{a}$ b) $\frac{c}{a}$

    c) $\frac{-c}{a}$ d) $\frac{b}{a}$

7. The sum of the zeros and the product of zeros of a quadratic polynomial are $\frac{-1}{2}$ and -3 **[1]** respectively. Write the polynomial.

8. A polynomial of degree five is divided by a quadratic polynomial. If it leaves a remainder, **[1]** then find the degree of remainder.

9. Which type of solution will equations x + 2y = 4 and 2x + y = 5 have? **[1]**

10. For what value of k the following pair of linear equations has unique solution? **[1]**
    7x + 8y = k
    9x - 4y = 12

11. For what value of a the following pair of linear equation has infinitely many solutions? **[1]**
    2x + ay = 8
    ax + 8y = a

12. For what value of k the following pair of linear equation has unique solution? **[1]**
    kx + 3y = 3
    12x + ky = 6

13. Find the discriminant of the quadratic equation $3\sqrt{3}x^2 + 10x + \sqrt{3} = 0$ **[1]**

14. Show that the equation $3x^2 + 7x + 8 = 0$ is not true for any real value of x. **[1]**

15. Find the value of 'p' so that the quadratic equation $4x^2 + 8x - p = 0$ has real roots. **[1]**

16. The product of two consecutive positive integers is 306. Form the quadratic equation to find **[1]** the integers, if x denotes the smaller integer.

17. If (3y-1), (3y+5) and (5y+1) are three consecutive terms of an AP then find the value of y. **[1]**

18. Sum of first 14 terms of an AP is 1505 and its first term is 10. Find its 25th term. **[1]**

19. What is the sum of first n terms of the AP a, 3a, 5a,..... **[1]**

20. Write the expression $a_n - a_k$ for the AP: a, a + d, a + 2d, ... and find the common difference of **[1]** the AP for which 11th term is 5 and 13th term is 79.

Section B

21. The ratio of incomes of two persons is 9:7 and the ratio of their expenditures is 4:3. If each of **[2]** them saves Rs.200 per month, find their monthly incomes.

22. The angles of a triangle are in A.P. The greatest angle is twice the least. Find all the angles. **[2]**

23. The sum of 4th and 8th terms of an A.P. is 24 and the sum of the 6th and 10th terms is 34. Find **[2]** the first term and the common difference of the A.P.

24. If 2 and -3 are the zeroes of the quadratic polynomial x^2 + (a + 1)x + b; then find the values of **[2]** a.

25. A rational number in its decimal expansion is 327.7081. What can you say about the prime **[2]** factors of q, when this number is expressed in the form p/q? Give reasons.

26. Find the least positive value of k for which the equation x^2 + kx + 4 = 0 has real roots. **[2]**

Section C

27. Find the LCM of the following polynomials: $x\left(8x^3 + 27\right)$ and $2x^2\left(2x^2 + 9x + 9\right)$ **[3]**

28. The sum of the squares of two consecutive positive even numbers is 452. Find the numbers. **[3]**

29. A plane left 40 minutes late due to bad weather and in order to reach its destination, 1600 km **[3]** away in time, it had to increase its speed by 400 km/hr from its usual speed. Find the usual speed of the plane.

30. Find all the zeros of $(x^4 + x^3 - 23x^2 - 3x + 60)$, if it is given that two of its zeros are $\sqrt{3}$ and $-\sqrt{3}$ **[3]**

31. On dividing $3x^3 + x^2 + 2x + 5$ by a polynomial g(x), the quotient and remainder are (3x - 5) and **[3]** (9x +10) respectively. Find g(x).

32. Solve for x and y: **[3]**
$\frac{6}{x-1} - \frac{3}{y-2} = 1$
$\frac{5}{x-1} - \frac{1}{y-2} = 2$, where $x \neq 1, y \neq 2$

33. A train covered a certain distance at a uniform speed. If the train had been 5 kmph faster, it **[3]** would have taken 3 hours less than the scheduled time. And, if the train were slower by 4 kmph, it would have taken 3 hours more than the scheduled time. Find the length of the journey.

34. The sum of three numbers in A.P. is 12 and sum of their cubes is 288. Find the numbers. **[3]**

Section D

35. Show that one and only one out of n, n + 4, n + 8, n + 12 and n + 16 is divisible by 5, where n is **[4]** any positive integer.

36. Given that the zeroes of the cubic polynomial $x^3 - 6x^2 + 3x + 10$ are of the form **[4]** $a, a + b, a + 2b$ for some real numbers a and b where a is the number of people who

believes in Yoga and b is the number of people who believes in Gym, find the values of a and b as well as the zeroes of the given polynomial.

37. Ved travels 600 km to his home partly by train and partly by car. He takes 8 hours if he travels 120 km by train and the rest by car. He takes 20 minutes longer if he travels 200 km by train and the rest by car. Find the speed of the train and the car. **[4]**

38. Romila went to a stationary stall and purchased 2 pencils and 3 erasers for Rs.9. Her friend Sonali saw the new variety of pencils and erasers with Romila, and she also bought 4 pencils and 6 erasers of the same kind for Rs.18. Represent this situation algebraically and graphically. **[4]**

39. A cottage industry produces a certain number of pottery articles in a day. It was observed on a particular day that cost of production of each article (in rupees) was 3 more than twice the number of articles produced on that day. If, the total cost of production on that day was Rs. 90, find the number of articles produced and the cost of each article. **[4]**

40. If the ratio of the sum of the first n terms of two APs is (7n +1): (4n + 27) then find the ratio of their 9th terms. **[4]**