PADMAVATI INTERNATIONAL SCHOOL
HOSUR-RABKAVI DIST BAGALKOTE KARNATAKA

CLASS 10 - MATHEMATICS
PERIODIC TEST 1

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

Section A

1. The product of a non-zero rational and an irrational number is   **[1]**

    a) always irrational   b) always rational

    c) one   d) rational or irrational

2. $7 \times 11 \times 13 + 13$ is a/an: **[1]**

    a) odd number but not composite   b) square number

    c) prime number   d) composite number

3. If α and β are the zeros of $2x^2 + 5x - 9$ then the value of $\alpha\beta$ is   **[1]**

    a) $\frac{-9}{2}$ b) $\frac{9}{2}$

    c) $\frac{5}{2}$ d) $\frac{-5}{2}$

4. If one of the zeroes of the quadratic polynomial $(k - 1) x^2 + kx + 1$ is -3, then the value of k is   **[1]**

    a) $\frac{-2}{3}$ b) $\frac{-4}{3}$

    c) $\frac{4}{3}$ d) $\frac{2}{3}$

5. The sum of the digits of a two digit number is 9. Nine times this number is twice the number   **[1]**
    obtained by reversing the digits, then the number is

    a) 72   b) 27

    c) 18   d) 81

6. For what value of k, do the equations $kx - 2y = 3$ and $3x + y = 5$ represent two lines intersecting   **[1]**
    at a unique point?

    a) all real values except -6   b) k = 3

    c) k = 6   d) k = -3

7. A quadratic equation $ax^2 + bx + c = 0$, has coincident roots, if   **[1]**

    a) $b^2 - ac = 0$ b) $b^2 - 4ac < 0$

    c) $b^2 - 4ac > 0$ d) $b^2 - 4ac = 0$

8. If $\frac{1}{2}$ is a root of the equation $x^2 + kx - \frac{5}{4} = 0$, then the value of k is   **[1]**

    a) $\frac{1}{2}$ b) -2

    c) $\frac{1}{4}$ d) 2

9. The number of terms of the A.P. 3, 7, 11, 15, ... to be taken so that the sum is 406 is **[1]**

    a) 14   b) 5

    c) 10   d) 12

10. If $a_1 = 4$ and $a_n = 4a_{n-1} + 3$, $n > 1$, then the value of a_4 is **[1]**

    a) 320   b) 329

    c) 319   d) 300

Section B

11. Prove that one and only one out of n, n + 2 and n + 4 is divisible by 3, where n is any positive integer. **[2]**

12. Use Euclid's division algorithm to find the HCF of 504 and 980. **[2]**

13. Find all zeros of the polynomial f(x) = $2x^4$ - $2x^3$ - $7x^2$ + 3x + 6, if its two zeros are $-\sqrt{\frac{3}{2}}$ and $\sqrt{\frac{3}{2}}$. **[2]**

14. Find the zeroes of quadratic polynomial given as: $6x^2$ - 3 - 7x and also verify the relationship between the zeroes and the coefficients. **[2]**

15. The sum of the digits of a two-digit number is 12. The number obtained by interchanging its digits exceeds the given number by 18. Find the number. **[2]**

16. Solve for x and y: **[2]**

$a^2x + b^2y = c^2$

$b^2x + a^2y = d^2$

17. The sum of two numbers is 9 and the sum of their reciprocals is $\frac{1}{2}$. Find the numbers. **[2]**

18. Find the roots of the equation $ax^2 + a = a^2x + x$ **[2]**

19. Find the sum of the first 15 terms of sequences having n^{th} term as x_n = 6 - n. **[2]**

20. Find the 10th term from the end of the A.P. 8,10,12,..., 126. **[2]**

Section C

21. Show that $5 - \sqrt{3}$ is irrational. **[3]**

22. The traffic lights at three different road crossings change after every 48 seconds, 72 seconds and 108 seconds respectively. If they all change simultaneously at 8 a.m. then at what time will they again change simultaneously? **[3]**

23. Divide $3x^4$- $10x^3$+ $5x^2$ + 11x - 12 by $3x^2$ - 10x + 8 and verify the division algorithm. **[3]**

24. Verify division algorithm for the polynomials f(x) = 8 + 20x + x^2 - $6x^3$ and g(x) = 2 + 5x - $3x^2$. **[3]**

25. Solve the pair of linear equations by reducing them to a pair of linear equations: **[3]**

6x + 3y = 6xy and 2x + 4y = 5xy

26. Five years ago, Nuri was thrice as old as Sonu. Ten years later, Nuri will be twice as old as Sonu. How old are Nuri and Sonu? **[3]**

27. Vikram wishes to fit three rods together in the shape of a right triangle. The hypotenuse is to be 2 cm longer than the base and 4 cm longer than the altitude. What should be the lengths of the rods? **[3]**

28. The length of a rectangle exceeds its width by 8 cm and the area of the rectangle is 240 sq. cm. Find the dimensions of the rectangle. **[3]**

29. If m times the mth term of an AP is equal to n times the nth term and m$\neq$ n,then show that its (m + n)th term is zero. **[3]**

30. In an AP: a = 8, a$_n$ = 62, S$_n$ = 210, find n and d. **[3]**

Section D

31. Prove that $\sqrt{5} + \sqrt{7}$ is irrational. **[4]**

32. If α and β are the zeroes of polynomial p(x) = 3x^2 + 2x + 1, find the polynomial whose zeroes are $\frac{1-\alpha}{1+\alpha}$ and $\frac{1-\beta}{1+\beta}$. **[4]**

33. Solve the system of equations: **[4]**
$\frac{1}{5x} + \frac{1}{6y} = 12$
$\frac{1}{3x} - \frac{3}{7y} = 8$

34. Two water taps together can fill a tank in $9\frac{3}{8}$ hours. The tap of a 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. **[4]**

35. The sum of the first three numbers in an Arithmetic Progression is 18. If the product of the first and the third term is 5 times the common difference, find the three numbers. **[4]**

36. The sum of digits of a two digit number is 13. If the number is subtracted from the one obtained by interchanging the digits. The result is 45. What is the number?

37. A rectangular field is 20 m long and 14 m wide. There is a path of equal width all round it. Having an area of 111 sq.m. Find the width of the path.