Real Numbers & Mixed First Term

TIME: 1hr **MM: 40**

General Instructions:

- All Questions are compulsory.
- Marks are given along with the questions individually.
- Use of calculator is not permitted.

Q.1 Prove that $\sqrt{7}$ is irrational.

Q.2 Prove that $3+2\sqrt{5}$ is irrational.

Q.3 Given t hat HCF (96, 404) = 4, find LCM (96, 404).

Q.4 Consider the numbers 6^n, where n is a natural number. Check whether there is any value of n for which 4^n ends with the digit zero.

Q.5 Find the LCM and HCF of 6 and 20 by the prime factorization method.

Q.6 Use Euclid's division lemma to show that the square of any positive integer is of the form

5q, 5q+1 ,5q+4 for some integer q.

Q.7 Use Euclid's algorithm to find the HCF of 196 and 38220.

Q.8 Show that any positive odd integer is of the form $4q + 1$, or $4q + 3$ where q is some integer.

Q.9 Find the quadratic polynomial, the sum and the product of whose zeroes are -3 and 2, respectively.

Q 10 Verify that 3, -1,-1/3 are the zeroes of the cubic polynomial $p(x) = 3x^3 – 5x^2 - 11x - 3$, and then Verify the relationship between the zeroes and the coefficients.

Q.11 Find all the zeroes of $x^4 – 3x^3 – x^2 + 9x - 6$, if you know that two of its zeroes are 3 and – 3.

Q.12 Divide the polynomial p(x) by the polynomial g(x) and find the quotient and reminders in each of the following:

$p(x) = x^4 – 5x + 6$, $g(x) = 2 – x^2$

Q.13 Check whether the first polynomial is a factor of the second polynomial by dividing the second Polynomial by the first polynomial: $x^3 – 3x + 1$, $x^5 – 4x^3 + x^2 + 3x + 1$

Q.14 Prove :-The ratio of the areas of two similar triangles is equal to the square of the ratio of their Corresponding sides.

Or

In a triangle, if square of one side is equal to the sum of the squares of the other two sides, then the angle opposite the first side is a right angle.

Q. 15 In an equilateral triangle A B C, D is a point on side BC such that BD =1/3 BC.

Prove that $9\ AD^2 = 7\ AB^2$

Q.16 In an equilateral triangle, prove that three times the square of one side is equal to four times the Square of one of its altitudes.