Introduction of Real Numbers

Definitions:

* '**Divisibility**': A non-zero integer 'b' is said to divide an integer 'a' such that $a = bc$, where, 'a' is called the dividend, 'b' is called the divisor and 'c' is called the quotient.
* **'Lemma'**: Any proven statement which is used to prove other statements Is called a 'lemma".
* **'Euclids division lemma'**: If 'a' and 'b' are any two positive integers, then there exists unique integers 'q' and 'r', such that $a = bq + r$; $0 \leq r < b$.

Note:

If 'b' is divided by 'a' i.e. b/a then $r = 0$, other wise r satisfies the stranger inequality $0 < r < a$.

* **Algorithm**: A series of well defined steps which provide a procedure of calculations repeated successively on the results of earlier steps till the derived result is obtained is called an algorithm.

(or)

A step by step procedure to solve a problem till we get the solution is called an algorithm.

* **Fundamental theorem of arithmetic**: Every composite number can be expressed (factorized) as a product of primes, and this factorization is unique except for the order in which the prime factors occur.

Note:

1. If 'a' and 'b' are two positive integers, then the formula to find the HCF of 'a' and 'b' is given by HCF (a, b) = a x b LCM (a,b)
2. If 'p', 'q', 'r' are three positive integers then the formula to find the HCF of 'p', 'q' and 'r' is given by HCF (p,q,r) = p x q x r x LCM (p, q, r) LCM(p,q) . LCM(q, r) . LCM(r,p)
3. Conditions for a rational number to be terminating or Non terminating decimal expansion.
   (a) If $x = a/b$, be a rational number and if the denominator 'b' can be expressed in the form of "2" x 5", then x has terminating decimal expansion.
   (b) If $x = a/b$, be a rational number and if the denominator 'b' can't be expressed in the form of "2" x 5", then x has a Non terminating decimal expansion.