Chapter – 6 Squares and Square Roots

- **Square**: Number obtained when a number is multiplied by itself. It is the number raised to the power 2. 2^2 = 2 x 2=4(square of 2 is 4).
- If a natural number m can be expressed as n^2, where n is also a natural number, then m is a **square number.**
- All square numbers end with 0, 1, 4, 5, 6 or 9 at unit's place.
- Square numbers can only have even number of zeros at the end.
- Square root is the inverse operation of square.
- There are two integral square roots of a perfect square number.
- Positive square root of a number is denoted by the symbol $\sqrt{}$ For example, 3^2=9 gives $\sqrt{9} = 3$
- **Perfect Square or Square number**: It is the square of some natural number. If $m=n^2$, then m is a perfect square number where m and n are natural numbers. Example: 1=1 x 1=12, 4=2 x 2=2^2.
- **Properties of Square number**:
  (i) A number ending in 2, 3, 7 or 8 is never a perfect square. Example: 152, 1028, 6593 etc.
  (ii) A number ending in 0, 1, 4, 5, 6 or 9 may not necessarily be a square number. Example: 20, 31, 24, etc.
  (iii) Square of even numbers are even. Example: 2^2 = 4, 4^2=16 etc.
  (iv) Square of odd numbers are odd. Example: 5^2 = 25, 9^2 = 81, etc.
  (v) A number ending in an odd number of zeroes cannot be a perferct square. Example: 10, 1000, 900000, etc.
  (vi) The difference of squares of two consecutive natural number is equal to their sum. $(n + 1)^2 - n^2$ = n+1+n. Example: $4^2 - 3^2$ =4 + 3=7. $12^2 - 11^2$ =12+11 =23, etc.
  (vii) A triplet (m, n, p) of three natural numbers m, n and p is called Pythagorean triplet, if $m^2 + n^2 = p^2$: $3^2 + 4^2 = 25 = 5^2$