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## Chapter – 7

### Cubes and Cube Root

- **Cube number:** Number obtained when a number is multiplied by itself three times.  
 $2^3 = 2 \times 2 \times 2 = 8$ ,  $3^3 = 3 \times 3 \times 3 = 27$ , etc.
  - Numbers like 1729, 4104, 13832, are known as Hardy – Ramanujan Numbers. They can be expressed as sum of two cubes in two different ways.
  - Numbers obtained when a number is multiplied by itself three times are known as cube numbers. For example 1, 8, 27, ... etc.
  - If in the prime factorisation of any number each factor appears three times, then the number is a perfect cube.
  - The symbol  $\sqrt[3]{\phantom{x}}$  denotes cube root. For example  $\sqrt[3]{27} = 3$
  - **Perfect Cube:** A natural number is said to be a perfect cube if it is the cube of some natural number. Example: 8 is perfect cube, because there is a natural number 2 such that  $8 = 2^3$ , but 18 is not a perfect cube, because there is no natural number whose cube is 18.
  - The cube of a negative number is always negative.
  - **Properties of Cube of Number:**
    - (i) Cubes of even number are even.
    - (ii) Cubes of odd numbers are odd.
    - (iii) The sum of the cubes of first n natural numbers is equal to the square of their sum.
    - (iv) Cubes of the numbers ending with the digits 0, 1, 4, 5, 6 and 9 end with digits 0, 1, 4, 5, 6 and 9 respectively.
    - (v) Cube of the number ending in 2 ends in 8 and cube of the number ending in 8 ends in 2.
    - (vi) Cube of the number ending in 3 ends in 7 and cube of the number ending in 7 ends in 3.
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