MODULE – 1 of 3 (HANDOUT)

Chapter – 9 (Sequences & Series)

Revised portion (for the session 2020-2021)

Sequence and Series – Sequence and Series, Arithmetic Progression (A. P.), Arithmetic Mean (A.M.), Geometric Progression (G.P.), General term of a G.P., Sum of n terms of a G.P., Infinite G.P. and its sum, Geometric mean (G.M.), Relation between A.M. and G.M.

Sequence

A sequence is an enumerated collection of objects in which repetitions are allowed and order matters

(M, A, R, Y) & (A, R, M, Y) are different Sequences

➢ **Rank (Index) -** The position of an element in a sequence is its *rank* or *index*.
➢ **Terms -** The various numbers occurring in a sequence are called its terms.
➢ **Finite & Infinite Sequences -** A sequence containing finite number of terms is called a **finite** sequence and with infinite terms infinite series.

Progressions

The Sequences following specific patterns are called *progressions*.

Fibonacci sequence – 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, ………

Mathematics Progressions

 ➢ *Arithmetic progression* **(A.P)**
 ➢ *Geometric progression* **(G.P)**
 ➢ *Harmonic progression* **(H.P)**

Series

Let a_1, a_2, a_3,…,a_n, be a given sequence, then, The expression $a_1 + a_2 + a_3$ +,…+ a_n + ... is called the *series associated with the given sequence* .

In compact form ↓

Series is $\sum_{k=1}^{n} a_k$.   (*Here the notation* Σ *is a Greek letter called sigma*)

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