



### Topic: 2.3 – SERIES OF POSITIVE TERMS

Series of positive terms:

General properties:

1. convergence of a series remains unchanged by the replacement, inclusion (or) omission of a finite number of terms.
2. A series remains convergent, divergent (or) oscillatory when each term of it is multiplied by a fixed number other than zero.
3. A series of positive terms either converges (or) diverges to  $+\infty$ , omitting the negative terms, the sum of first  $n$  terms tends to either a finite limit (or)  $+\infty$ .
4. Every finite series is a convergent series.

Problem:

Series of positive terms.

1. If all the terms after few negative terms in an infinite series are positive, such a series is a positive term series.



Problem:

Series of positive term.

1. If all the terms after few negative terms in an infinite series are positive, such a series is a positive term series.

Eg:  $-10 - 6 - 1 + 5 + 12 + 20 + \dots$

2. A series of positive terms either converges (or) diverges to  $\infty$ , for the sum of first  $n$  terms, omitting the negative term, tends to either a finite limit (or)  $\infty$ .

3. Necessary condition for convergence. If a +ve term series  $\sum u_n$  is convergent, then  $\lim_{n \rightarrow \infty} u_n = 0$ . but the converse not true.

4. Test for divergence.

If  $\lim_{n \rightarrow \infty} u_n \neq 0$ , the series  $\sum u_n$  must be divergent.



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