

UNIT TEST Class: XI
[Sequence and Series]

Time: - 1 ½ hr

F.M-50

(Answer **ALL** questions)

Group- A [2 × 10 = 20]

- 1- a) : Write the first three terms in the sequence defined by $a_n = \frac{(n-3)}{4}$.
- b) : find first five terms of the sequence a_n where : $a_1 = 1, a_n = a_{n-1} + 2$ for $n \geq 2$.
- c) : Insert 6 numbers between 3 and 24 such that the resulting sequence is an AP.
- d) : Find the sum of n terms of the AP, whose k^{th} term is $(5k + 1)$?
- e) : Find the 10^{th} and r^{th} terms of the GP : 5, 25, 125,?
- f) : Insert three numbers between 1 and 256 so that the resulting sequence is a GP?
- g) : For what value of x , the numbers : $-\frac{2}{7}, x, -\frac{7}{2}$ are in GP?
- h) : Find the sum of n terms of the series: $3 + 7 + 13 + 21 + 31 + \dots$?
- i) : Find the value of : $\frac{1}{2} + \frac{1}{2^2} + \frac{1}{2^3} + \frac{1}{2^4} + \dots \infty$?
- j) : Find the sum of first 5 terms of the series: $1 + \frac{2}{3} + \frac{4}{9} + \dots$?

Group- B [5 × 6 = 30]

- (2) : The sum of n terms of two arithmetic progressions are in the ratio $(3n + 8) : (7n + 15)$. Find the ratio of their 12^{th} terms.
- (3) : Sum. of the first p, q and r terms of an AP are a, b and c , respectively.
Prove that : $\frac{a}{p}(q-r) + \frac{b}{q}(r-p) + \frac{c}{r}(p-q) = 0$
- (4) : Find the sum of the sequence 7, 77, 777, 7777, to n terms?
- (5) : The number of bacteria in a certain culture doubles every hour. If there were 30 bacteria present in the culture originally, how many bacteria will be present at the end of 2^{nd} hour, 4^{th} hour and n^{th} hour?
- (6) : If $(a^2 + b^2 + c^2)p^2 - 2(ab + bc + cd)p + (b^2 + c^2 + d^2) \leq 0$, then show that a, b, c , and d are in GP where a, b, c, d and p are different real numbers.
- (7) : Find the sum of the following series up to n terms:

$$\frac{1^3}{1} + \frac{1^3 + 2^3}{1+3} + \frac{1^3 + 2^3 + 3^3}{1+3+5} + \dots$$

Ranjan Ku Mohapatra
mahapatra.ranjan@rediffmail.com