Maths

Reg.No. :

I.Answer all the questions.

II.Use Blue pen only.

Time : 01:15:00 Hrs

Total Marks : 60

Section-A

4 x 1 = 4

1) If $x \neq 0$, then $1 \sec\ x + \sec^2\ x + \sec^3\ x + \sec^4\ x + \sec^5\ x$ is equal to

(a) $\left(1 + \sec\ x\right) + \left(\sec^2\ x + \sec^3\ x + \sec^4\ x\right)$ (b) $\left(1 + \sec\ x\right)\left(1 + \sec^2\ x + \sec^4\ x\right)$ (c) $\left(1 - \sec\ x\right)\left(\sec\ x + \sec^3\ x + \sec^5\ x\right)$

(d) $\left(1 + \sec\ x\right)\left(1 + \sec^3\ x + \sec^4\ x\right)$

2) If the nth term of an A.P. is $t_n = 3 - 5n$, then the sum of the first n terms is

(a) $\frac{n}{2}[1 - 5n]$ (b) $n\left(1 - 5n\right)$ (c) $\frac{n}{2}\left(1 + 5n\right)$ (d) $\frac{n}{2}\left(1 + n\right)$

3) The common ratio of the G.P. a^{m-n}, a^m, a^{m+n} is

(a) a^m (b) a^{-m} (c) a^n (d) a^{-n}

4) If $1 + 2 + 3 + \ldots + n = $ k then $1^3 + 2^3 + \cdots n^3$ is equal to

(a) k^2 (b) k^3 (c) $\frac{k(k+1)}{2}$ (d) $(k+1)^3$

Section-B

5 x 2 = 10

5) Find S_n for each of the geometric series described below: $a = 2400, r = -3, n = 5$

6) Find the value of k if $1^3 + 2^3 + 3^3 + \cdots + k^3 = 2025$.

7) How many consecutive terms starting from the first term of the series $2 + 6 + 18 + \cdots$ would sum to 728 ?

8) Find S_n for each of the geometric series described below. $a = 5, r = 3, n = 12$.

9) Find the sum of the first 125 natural numbers.

Section-C

5 x 5 = 25

10) Find the sum of the following series $1^2 + 3^2 + 5^2 + \cdots + 51^2$.

11) Find the sum of the series. $11^3 + 12^3 + 13^3 + \cdots + 28^3$

12) If $1 + 2 + 3 + \cdots + n = 120$,find $1^3 + 2^3 + 3^3 + \cdots n^3$.

13) Find the sum of first n terms of the series $0.4 + 0.94 + 0.994 + \cdots$.

14) Find the sum of the following finite series $1 + 11 + 111 + \cdots\ to\ 20$ terms.

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