

UNIT TEST – 2

STD : X
SUBJECT : MATHS

TIME : 1 ½ Hrs
MARKS : 50

SEQUENCE AND SERIES

SECTION – I

10 x 1 =10

NOTE: (i) Answer all the 10 questions

(ii) Choose the correct answer from the given four alternatives and write the option code and the corresponding answer

1. If a, b, c, l, m are in A.P, then the value of $a - 4b + 6c - 4l + m$ is
a) 1 b) 2 c) 3 d) 0
2. If a, b, c are in A.P, then $\frac{a-b}{b-c}$ is equal to
a) $\frac{a}{b}$ b) $\frac{b}{c}$ c) $\frac{a}{c}$ d) 1
3. If $k+2, 4k-6, 3k-2$ are the three consecutive terms of an A.P, then the value of k is
a) 2 b) 3 c) 4 d) 5
4. 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) $n(1-5n)$ c) $\frac{n}{2}[1+5n]$ d) $\frac{n}{2}[1+n]$
5. If a_1, a_2, a_3, \dots are in A.P such that $\frac{a_4}{a_7} = \frac{3}{2}$, then 13th term of the A.P is
a) $\frac{3}{2}$ b) 0 c) 12a d) 14a
6. 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}
7. The sequence -3, -3, -3, is
a) an A.P. only b) a G.P. only c) Neither A.P nor G.P d) Both A.P and G.P
8. If the third term of a G,P is 2, then the product of first 5 terms is
a) 5^2 b) 2^5 c) 10 d) 15
9. If $x \neq 0$, then $1 + \sec x + \sec^2 x + \sec^3 x + \sec^4 x + \sec^5 x =$
a) $(1+\sec x)(\sec^2 x + \sec^3 x + \sec^4 x)$ b) $(1+\sec x)(1 + \sec^2 x + \sec^4 x)$
c) $(1- \sec x)(\sec x + \sec^3 x + \sec^5 x)$ d) $(1+\sec x)(1 + \sec^3 x + \sec^4 x)$
10. In a G.P $t_2 = \frac{3}{5}$ and $t_3 = \frac{1}{5}$, then the common ratio is
a) $\frac{1}{5}$ b) $\frac{1}{3}$ c) 1 d) 5

SECTION – II

5 x 2 =10

NOTE: (i) Answer 5 questions

(ii) Question number 17 is compulsory. Select any 4 questions from the first 6 questions

11. Find the first six terms of the sequence given by $f_1 = f_2 = f_3 = 1$ and $f_n = f_{n-1} + f_{n-2}$, $n = 3, 4, \dots$
12. A man saves Rs.320 in the month of January, Rs.360 in the month of February, Rs.400 in the month of March. If he continues his savings in this sequence, What will be his savings in the month of November in the same year?
13. The fifth term of a G.P. is 1875. If the first term is 3, Find the Common ratio.
14. Find the sum of the arithmetic series $5 + 11 + 17 + \dots + 95$.
15. An organization plans to plant saplings in 25 streets in a town in such a way that one sapling for the first street, two for the second, four for the third, eight for the fourth street and so on. How many saplings are needed to complete the work?
16. Find the sum of $1^3 + 2^3 + 3^3 + \dots + 20^3$.
17. If a, b and c are in Arithmetic Progression, then prove that $(a-c)^2 = 4(b^2-ac)$.

(OR)

The sum of first n terms of a certain series is $3n^2 - 2n$. Show that the series is an arithmetic series.

SECTION – III

6 x 5 =30

NOTE: (i) Answer 6 questions

(ii) Question number 25 is compulsory. Select any 5 questions from the first 7 questions

18. If a^2, b^2, c^2 are in A.P. then show that $\frac{1}{b+c}, \frac{1}{c+a}, \frac{1}{a+b}$ are also in A.P.
19. An amount Rs.500 is deposited in a bank which pays annual interest at the rate of 10% compounded annually. What will be the value of this deposit at the end of 10th year?

20. The n^{th} term of a sequence is defined by $t_n = pn^2 + qn + 15$. If $t_2 = 13$ and $t_4 = 27$,
Find p and q .
21. Find the sum to 'n' terms of the series $6 + 66 + 666 + \dots$
22. Find the sum of all 3 digit natural numbers, which are divisible by 9.
23. If S_1, S_2 and S_3 are the sum of first $n, 2n$ and $3n$ terms of a geometric series respectively, then prove that $S_1(S_3 - S_2) = (S_2 - S_1)^2$.
24. Find the total area of 14 squares whose sides are 11cm, 12cm, ..., 24cm, respectively.
25. If the geometric sequences $162, 54, 18, \dots$ and $\frac{2}{81}, \frac{2}{27}, \frac{2}{9}, \dots$ have their n^{th} term equal. Find the value of n .

(OR)

The measures of the interior angles taken in order of a polygon form an arithmetic sequence. The least measurement in the sequences is 85° . The greatest measurement is 215° . Find the number of sides in the given polygon.