Long Answer-I Type Questions

1. Write the first five terms of the following sequences:

(*i*) $a_n = n(n + 2)$

(*ii*) $a_n = 2^n$

(*iii*) $a_n = \dfrac{n}{n+1}$

(*iv*) $a_n = \dfrac{2n-3}{6}$

(*v*) $a_n = (-1)^{n-1}\, 5^{n+1}$

(*vi*) $a_n = \dfrac{n(n^2+5)}{4}$

(*vii*) $a_n = \dfrac{(-1)^n a^n}{a^n + b^n}$

(*viii*) $a_n = \dfrac{n(n+1)(2n+1)}{6}$.

2. Write the first five terms of the following sequences and obtain the corresponding series:

(*i*) $a_1 = 3,\ a_n = 3a_{n-1} + 2,\ n > 1$

(*ii*) $a_1 = -1,\ a_n = \dfrac{a_{n-1}}{n},\ n \geq 2$

(*iii*) $a_1 = a_2 = 2,\ a_n = a_{n-1} - 1,\ n > 2$

(*iv*) $a_1 = 2,\ a_2 = 4,\ a_n = 2a_{n-1} + 3a_{n-2},\ n \geq 3.$

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Very Short Answer Type Questions

1. Show that 4, 10, 16, 22,··· is an AP. Find its 7th and 9th terms.
2. Show that $6, 5\frac{1}{3}, 4\frac{2}{3}, 4, \cdots$ is an AP. Find its 10th and kth terms.
3. Find the 20th, 25th and nth terms of the AP given by 21, 16, 11, 6, ··· .
4. Show that $\log a, \log ab, \log ab^2, \cdots$ is an AP. Find its 7th and nth terms.
5. If $k + 2, 4k - 6, 3k - 2$ are in AP, find the value of k.
6. Show that the linear function in n *i.e.*, $f(n) = an + b$ determine an AP, where a and b are constants.

Long Answer-I Type Questions

7. Determine the number of terms in the sequence $17, 14\frac{1}{2}, 12, \cdots, -38$.
8. Which term of the series $20 + 16 + 12 + \cdots$ is -96?
9. Is 310 a term of the sequence 3, 8, 13, ···?
10. If the 9th term of an AP be zero, show that its 29th term is twice its 19th term.
11. In a certain AP, the 24th term is twice the 10th term. Show that its 72nd term is twice the 34th term.
12. The 3rd term of an AP is 1 and the 6th term is -11. Determine its 15th and rth terms.
13. Determine the 2nd and rth terms of an AP whose 6th term is 12 and the 8th term is 22.
14. Determine x so that $2x + 1, x^2 + x + 1$ and $3x^2 - 3x + 3$ are consecutive terms of an AP.
15. If 5 times the 5th term of an AP is equal to 10 times the 10th term, find the 15th term of the AP.
16. (*i*) Which term of the AP $8 - 6i, 7 - 4i, 6 - 2i, \cdots$ is (*a*) purely real (*b*) purely imaginary?

    (*ii*) Which term of the sequence $20, 19\frac{1}{4}, 18\frac{1}{2}, \cdots$ is the first negative term?

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