Chapter 6 (Objectives)
SEQUENCE AND SERIES

TEXTBOOK OF ALGEBRA AND TRIGONOMETRY FOR CLASS XI

Item 1: Fill in the blanks (Completion Items)

1. Sequences are also called _____.
2. Sequence is denoted by _____.
3. An _____ sequence has no last term.
4. The difference between two consecutive terms in A.P. is called the _____.
5. If $\{a_n\}$ is an _____ then $a_n - a_{n-1} = d$ for $n > 0$..
6. $a_n = a + (n-1)d$ is called _____ or general term of an A.P.
7. If a, A, b are in A.P then $A - a =$ _____.
8. A.M between a_{n-1} and a_{n+1} is _____.
9. If all terms of the sequence are real number then it is called _____ sequence.
10. Finite series has _____ number of terms.
11. $S_{2n} = n(a_1 + a_{2n})$ denotes the sum of _____ terms in A.P.
12. Infinite series has _____ number of terms.
13. If a_n is the A.M. between a_{n-1} and a_{n+1} then a_n = _____.
14. _____ can not be terms in G.P.
15. The common ratio $\frac{a_n}{a_{n-1}}$ exists if $a_{n-1} \neq$ _____.
16. $a_n = ar^{n-1}$ is called general term of a _____.
17. If a, G, b are in G.P. then $\frac{G}{a} =$ _____.
18. If a, G, b are in G.P. then $G^2 =$_____.
19. If $\{a_n\}$ is a G.P. then $S_n = \frac{a(1-r^n)}{1-r}$ when $r \neq$ _____.
20. If $G_1, G_2, ..., G_n$ are n G.P. between a and b then $\sqrt[n]{G_1 \cdot G_2 \cdot ..... \cdot G_n} =$_____.
21. When $\lim_{n\to\infty} S_n$ does not exists, the series is said to be _____.
22. If S_n exists when $n \to \infty$ then the series is said to be _____.
23. Middle term of three consecutive terms in A.P. is the _____ between the extreme terms.
24. _____ can not be the term of H.P.
25. If a, H, b are in H.P. then H = _____.
26. $1^3 + 2^3 + 3^3 + \cdots\cdots\cdots + n^3 =$ _____.
27. The next term of the sequence 7, 9, 12, 16, is _____.
28. The 5th term of G.P. 3, 6, 12, is _____.
29. G.M. between $1/-2i$ and $1/8i$ is _____.
30. The sum of infinite geometric series $2, \sqrt{2}, 1, ...$ is _____.
31. The general term of the series $1^2 + 3^2 + 5^2 + \cdots\cdots$ is _____.
32. The 12th term of $\frac{1}{2}, \frac{1}{5}, \frac{1}{8}, ...$ is _____.
33. The G.M. between $-2i$ and $8i$ is _____.
34. $1 + 3 + 5 + ...$ to n terms, can be written as $\sum_{k=1}^{n}$_____.
35. If $a_n = (-1)^{n+1}$ then its 21st term is _____.
36. If A_1, A_2, A_3 are in H.P. then $\frac{1}{A_1}, \frac{1}{A_2}, \frac{1}{A_3}$ are in _____.

37. $\dfrac{ab(n+1)}{b+na}$ is the *n*th _____ between *a* and *b*.
38. For any two distinct _____ real numbers $A > G > H$.
39. The infinite Geometric series converges if $|r|$ _____.
40. The *n*th term of the sequence $\left(\frac{1}{3}\right)^2, \left(\frac{2}{3}\right)^2, \left(\frac{3}{3}\right)^2, \ldots\ldots\ldots\ldots$, is _____.
41. If $S_n \to a$ limit as $n \to \infty$ then the series is said to be _____.

Item 2: True or False

1. A sequence is a special type of a function from a subset of $\mathbb{N}$ to $\mathbb{N}$ or $\mathbb{C}$.
2. In real sequence, all the terms must be real numbers.
3. Sequence is denoted by a_n.
4. Finite sequence has limited number of terms.
5. An infinite sequence has no last term.
6. The first four terms of the sequence $\{2n-3\}$ are -1, 1, 3, 4.
7. A sequence $\{a_n\}$ is an A.P. if $a_n - a_{n-1} = d$ for all $n \in \mathbb{N}$ and $n > 0$.
8. $a_n = a + (n+1)d$ is *n*th term of G.P.
9. If $a = 3, d = 7$ in the A.P. then $a_n = 10 + 7n$.
10. If *a*, *A*, *b* are in A.P. then $A = \dfrac{a+b}{2}$.
11. A.M. between -1 and 1 is 0.
12. $a + (a+d) + (a+2d) + \cdots\cdots + a + (n-1)d$ is an A.P.
13. A finite series has infinite number of terms.
14. Infinite series has unlimited number of terms.
15. For any sequence $\{a_n\}$, $S_n = a_1 + a_2 + a_3 + \cdots\cdots\cdots + a_{n-1}$.
16. If $\{a_n\}$ is an A.P. then $S_n = \dfrac{n}{2}(a_1 - a_n)$.
17. *n* (number of term) can not be negative.
18. Geometric sequence and Geometric progression are two types of sequence.
19. In G.P. $\dfrac{a_n}{a_{n-1}} = r$ for all $n \in \mathbb{N}$ and $n > 0$.
20. $r = \dfrac{a_n}{a_{n-1}}$ exists when $a_{n-1} = 0$.
21. No term of G.P is zero.
22. 6^{th} term of G.P. 3, 6, 12, 24, ……. is 96.
23. If *a*, *G*, *b* are in G.P then $G^2 = \pm\sqrt{ab}$.
24. 0, 2, 4, 8, …..… is a G.P.
25. G.M. between 4 and 16 is ± 8.
26. $S_\infty = \dfrac{a}{1-r}$ exists when $r = 1$.
27. $\lim\limits_{n\to\infty} r^n = 0$ when $|r| > 1$.
28. Infinite geometric series converges for $|r| < 1$.
29. The sequence $1, \frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \cdots\cdots\cdots$ is a H.P.
30. If *a*, *H*, *b* are in H.P. then $H = \dfrac{2ab}{a+b}$.
31. $\sqrt{a} - \sqrt{b}$ is a real number where $a, b \in \mathbb{R}$.

32. $1+2+3+\cdots\cdots\cdots+n=\dfrac{n(n+1)}{6}$
33. $1^2+2^2+3^2+\cdots\cdots\cdots n^2=\dfrac{n(n+1)(n+2)}{6}$.
34. Term of the sequence are in definite order.
35. A sequence is said to be a function from set $\mathbb{R}$ to set $\mathbb{N}$.
36. Domain of the sequence is some time taken as the set of whole numbers.
37. There are one-one correspondence between the set of natural numbers and the terms of a sequence.
38. If 1,3,5,..... is the sequence then $a_n=2n+1$.
39. In an A.P. ratio of any two consecutive terms is same.
40. $G_n=a\left(\dfrac{b}{a}\right)^{\frac{n}{n+1}}$ is the *n*th G.Ms between *a* and *b*.
41. If *a*, *b*, *c* and *d* are in G.P. then $b^2=ac$ and $c^2=bd$.
42. If the population of village increase geometrically at the rate of 4% annually then $r = 1 + 0.004$.
43. For any two distinct negative real numbers *a* and *b*, $A>G>H$.
44. $a_1-a_1+a_1-a_1+a_1-a_1+\ldots\ldots\ldots\ldots$ is called an oscillatory series.

ANSWERS

Item I: Fill in the Blanks

1. Progressions ***2.*** $\{a_n\}$ ***3.*** Infinite ***4.*** Common difference ***5.*** A.P.

6. *n*th term ***7.*** $b-A$ ***8.*** $\dfrac{a_{n-1}+a_{n+1}}{2}$ ***9.*** Real ***10.*** Finite ***11.*** $2n$

12. Infinite ***13.*** $\dfrac{a_{n-1}+a_{n+1}}{2}$ ***14.*** Zero ***15.*** Zero ***16.*** G.P. ***17.*** $\dfrac{b}{G}$

18. ab ***19.*** 1 (One) ***20.*** $\sqrt{ab}$ ***21.*** Divergent ***22.*** Convergent ***23.*** A.M.

24. Zero ***25.*** $\dfrac{2ab}{a+b}$ ***26.*** $\dfrac{n^2(n+1)^2}{4}$ ***27.*** 21 ***28.*** 48 ***29.*** $\dfrac{1}{4}$

30. $4+2\sqrt{2}$ ***31.*** $(2n-1)^2$ ***32.*** $1/35$ ***33.*** 4 ***34.*** $(2k-1)$ ***35.*** 1

36. A.P. ***37.*** H.M. ***38.*** positive ***39.*** less than 1 ***40.*** $\left(\dfrac{n}{3}\right)^2$ ***41.*** Convergent

Item 2: True or False

1. False	***2.*** True	***3.*** False	***4.*** True	***5.*** True	***6.*** False
7. True	***8.*** False	***9.*** False	***10.*** True	***11.*** True	***12.*** False
13. False	***14.*** True	***15.*** False	***16.*** True	***17.*** True	***18.*** False
19. True	***20.*** False	***21.*** True	***22.*** True	***23.*** False	***24.*** False
25. True	***26.*** False	***27.*** False	***28.*** True	***29.*** True	***30.*** True
31. True	***32.*** False	***33.*** True	***34.*** True	***35.*** False	***36.*** True
37. True	***38.*** False	***39.*** False	***40.*** True	***41.*** True	***42.*** False
43. False	***44.*** True				

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