

SEQUENCES AND SERIES

Multiple Choice Questions

2. The number of integers between 100 and 1000 that are not divisible by 7 is
(a) 128 (b) 899 (c) 771 (d) 772
3. In an A.P. the p th term is q and the $(p + q)$ th term is zero, then the q th term is
(a) $-p$ (b) p (c) $p + q$ (d) $p - q$
4. The 10th common term between the series $3 + 7 + 11 + \dots$ and $1 + 6 + 11 + \dots$ is
(a) 191 (b) 193 (c) 211 (d) none of these
5. If the sum of n terms of an A.P. is given by $S_n = 3n + 2n^2$, then the common difference of the A.P. is
(a) 3 (b) 2 (c) 6 (d) 4
6. If 9 times the 9th term of an A.P. is equal to 13 times the 13th term, then the 22nd term of the A.P. is
(a) 0 (b) 22 (c) 220 (d) 198
7. If T_r be the r th term of an A.P. with first term a and common difference d , $T_m = 1/n$ and $T_n = 1/m$, then $a - d$ equals
(a) $1/(mn)$ (b) 1 (c) 0 (d) $1/m + 1/n$
8. The sum of all odd numbers between 1 and 1000 which are divisible by 3, is
(a) 90000 (b) 83367 (c) 93660 (d) none of these
9. The sum of all two digit numbers which when divided by 4 leave 1 as remainder is
(a) 1210 (b) 1120 (c) 1021 (d) 1102
10. If $\log_3 2$, $\log_3(2^x - 5)$ and $\log_3(2^x - 7/2)$ are in A.P., then the value of x is
(a) 2 (b) 3 (c) 4 (d) 2, 3
11. Let a, b, c be in A.P. If p is the A.M. between a and b and q is the A.M. between b and c , then b is equal to
(a) $(p + q)/2$ (b) $(p - q)/2$ (c) $(q - p)/2$ (d) $pq/2$
12. If the ratio of second to seventh of n A.M.'s between -7 and 65 is $1 : 7$, then n is
(a) 10 (b) 11 (c) 12 (d) 13
13. In a G.P. first term is $3/4$, common ratio is 2 and the last term is 384, then the number of terms of G.P. is
(a) 8 (b) 9 (c) 10 (d) 11
14. The first and second terms of a G.P. are x^{-4} and x^m respectively. If its 8th term is x^{52} , then the value of m is
(a) 8 (b) 6 (c) 4 (d) 2
15. If the first term of a G.P. is 27 and 8th term is $1/81$, then the sum of its first 10 terms is
(a) $27/2 (1 - 1/3^{10})$ (b) $81/2 (1/3^{10} - 1)$
(c) $27/2 (1/3^{10} - 1)$ (d) $81/2 (1 - 1/3^{10})$
16. The product of 5 terms of G.P. whose 3rd term is 2 is
(a) 5^2 (b) 2^5 (c) 32 (d) 3^5
17. If 3rd, 8th and 13th terms of a G.P. are p, q and r respectively, then which one of the following is correct?
(a) $q^2 = pr$ (b) $r^2 = pq$ (c) $pqr = 1$ (d) $2q = p + r$
18. Let a, b, c be in A.P. and $k \neq 0$ be a real number. Which of the following is/are correct?
(i) ka, kb, kc are in A.P.
(ii) $k - a, k - b, k - c$ are in A.P.
(iii) $a/k, b/k, c/k$ are in A.P.
(a) (i) and (ii) only (b) (ii) and (iii) only (c) (i) and (iii) only (d) (i), (ii) and (iii)
19. How many two digit numbers are divisible by 4?
(a) 21 (b) 22 (c) 24 (d) 25

20. A G.P. consists of 200 terms. If the sum of odd terms of G.P. is m and sum of even terms of G.P. is n , then the common ratio of G.P. is
(a) m/n (b) n/m (c) $m + n/m$ (d) $n + m/n$
21. If an infinite G.P. has the first term a and the sum 5, then which one of the following is correct?
(a) $a < -10$ (b) $-10 < a < 0$ (c) $0 < a < 10$ (d) $a > 10$
22. The value of $2 \times 2^{1/2} \times 2^{1/4} \times 2^{1/8} \times \dots$ to ∞ is
(a) 4 (b) $\sqrt{2}$ (c) $2\sqrt{2}$ (d) 8
23. If the second term of a G.P. is 2 and the sum of its infinite terms is 8, then G.P. is
(a) 8, 2, 1, $1/2$, $1/4$, ...
(b) 10, 2, $2/5$, $2/25$, ...
(c) 4, 2, 1, $1/2$, $1/4$, ...
(d) 6, 3, $3/2$, $3/4$, ...
24. If x, y, z are positive integers, then the value of the expression $(x + y)(y + z)(z + x)$ is
(a) $= 8xyz$ (b) $> 8xyz$ (c) $< 8xyz$ (d) $= 4xyz$
25. In a G.P. of positive terms, if any term is equal to the sum of the next two terms, then the common ratio of the G.P. is
(a) $\sin 18^\circ$ (b) $2 \cos 18^\circ$ (c) $\cos 18^\circ$ (d) $2 \sin 18^\circ$
26. If the sum of first two terms of an infinite G.P. is 1 and every term is twice the sum of all the successive terms, then its first term is
(a) $1/3$ (b) $2/3$ (c) $3/4$ (d) $1/4$
27. If $x, 2y, 3z$ are in A.P. where the distinct numbers x, y, z are in G.P., then the common ratio of G.P. is
(a) 3 (b) $1/3$ (c) 2 (d) $1/2$
28. Let S_n denote the sum of the cubes of the first n natural numbers and s_n denote the sum of first n natural numbers, then S_n/s_n is equal to
(a) $n(n + 1)(n + 2)/6$ (b) $n(n + 1)/2$
(c) $(n^2 + 3n + 2)/2$ (d) $(2n + 1)/3$
29. If t_n denotes the n th term of the series $2 + 3 + 6 + 11 + 18 + \dots$, then t_{50} is
(a) $49^2 - 1$ (b) 49^2 (c) $50^2 + 1$ (d) $49^2 + 2$
30. If every term of a G.P. with positive terms is the sum of its two previous terms, then the common ratio of the G.P. is
(a) 1 (b) $2/\sqrt{5}$ (c) $(\sqrt{5} - 1)/2$ (d) $(\sqrt{5} + 1)/2$
31. The value of $9^{1/3} \times 9^{1/9} \times 9^{1/27} \times \dots$ to ∞ is
(a) 1 (b) 3 (c) 9 (d) none of these
32. If the first, second and the last terms of an A.P. are a, b and $2a$, respectively, then its sum is
(a) $ab/[2(b - a)]$ (b) $ab/(b - a)$ (c) $3ab/[2(b - a)]$ (d) none of these
33. If the sum of two extreme numbers of an A.P. with four terms is 8 and the product of remaining two middle terms is 15, then the greatest number will be
(a) 5 (b) 7 (c) 9 (d) 11

FILL IN THE BLANKS

Fill in the blanks in questions (1 to 16):

1. The 20th term of the sequence defined by $a_n = n(n - 2)/(n + 3)$ is _____.
2. If a, b, c are in A.P., then $(a - b)/(b - c) =$ _____.
3. If a, b, c, d and e are in A.P., then $a - 4b + 6c - 4d + e =$ _____.
4. The sum of terms equidistant from the beginning and the end in an A.P. is equal to _____.
5. The sum of 11 terms of an A.P. whose 6th term is 5 is _____.
6. The sum of 14 terms of an A.P. whose 7th and 8th terms are 11 and 13 respectively is _____.

7. If S is the sum of n arithmetic means between two given numbers a and b and A is the single arithmetic mean between the given numbers, then the value of $S/A =$ _____.
8. If $(a^n + b^n)/(a^{n-1} + b^{n-1})$ is the A.M. between a and b , then $n =$ _____.
9. The n th term of the series $1/\sqrt{2} - 2 + 4\sqrt{2} - 16 + \dots$ is _____.
10. If $x, x + 3, x + 9$ are first three terms of a G.P., then $x =$ _____.
11. If a, b, c are in A.P., then $10^{(ax + 10)}, 10^{(bx + 10)}, 10^{(cx + 10)}, x \neq 0$ are in _____.
12. If 5th, 9th and 13th terms of a G.P. are x, y and z respectively, then x, y, z are in _____.
13. If a, b, c are in G.P., then $\log_e a, \log_e b, \log_e c$ are in _____.
14. The value of $1 - 2 + 3 - 4 + 5 - \dots + 101 =$ _____.
15. The sum of the series $3 - 1 + 1/3 - 1/9 + \dots + \infty$ is _____.
16. If A and G are A.M. and G.M. respectively between two positive numbers, then numbers are _____.