Chapter 02

Sequence And Series

Practice Section-01

Q.1 There are n A.M.'s between 3 and 29 such that 6th mean : (n – 1)th mean : : 3 : 5 then find the value of n.

(1) 4 (2) 12 (3) 6 (4) 7

Q.2 If n arithmetic means are inserted between 2 and 38, then the sum of the resulting series is obtained as 200. Then find the value of n.

(1) 8 (2) 10 (3) 12 (4) None

Q.3 If for an A.P. $T_3 = 18$ and $T_7 = 30$ then S_{17} is equal to-

(1) 612 (2) 622 (3) 306 (4) None of these

Q.4 The first, second and middle terms of an AP are a, b, c respectively. Their sum is-

(1) $\frac{2(c-a)}{b-a}$ (2) $\frac{2c(c-a)}{b-a}+c$ (3) $\frac{2c(b-a)}{c-a}$ (4) $\frac{2b(c-a)}{b-a}$

Q.5 The sum of integers in between 1 and 100 which are divisible by 2 or 5 is-

(1) 3100 (2) 3600 (3) 2950 (4) 3500

Q.6 If $a_1, a_2, a_3.....a_n$ are in AP where $a_i > 0 > i$ then the value of

$$\frac{1}{\sqrt{a_1}+\sqrt{a_2}}+\frac{1}{\sqrt{a_2}+\sqrt{a_3}}+...+\frac{1}{\sqrt{a_{n-1}}+\sqrt{a_n}} =$$

(1) $\frac{1}{\sqrt{a_1}+\sqrt{a_n}}$ (2) $\frac{1}{\sqrt{a_1}-\sqrt{a_n}}$ (3) $\frac{n}{\sqrt{a_1}-\sqrt{a_n}}$ (4) $\frac{n-1}{\sqrt{a_1}+\sqrt{a_n}}$

Q.7 The first term of an A.P. of consecutive integer is $p^2 + 1$. The sum of $(2p + 1)$ terms of this series can be expressed as

(1) $(p + 1)^2$ (2) $(2p + 1)(p + 1)^2$ (3) $(p + 1)^3$ (4) $p^3 + (p + 1)^3$

Q.8 If the sum of the first 2n terms of the A.P. 2, 5, 8, ..., is equal to the sum of the first n terms of the A.P. 57, 59, 61, ..., then n equals

(1) 10 (2) 12 (3) 11 (4) 13

Practice Section-02

Q.1 If the sum of first 6 terms of a G.P. is nine times of the sum of its first three terms, then its common ratio is-

(1) 1 (2) 3/2 (3) 2 (4) – 2

Q.2 If x, y, z are in G.P. and $a^x = b^y = c^z$ then-

(1) $\log_b a = \log_a c$ (2) $\log_c b = \log_a c$ (3) $\log_b a = \log_c b$ (4) None of these

Q.3 If a, b, c, d are in G.P., then $(a^3 + b^3)^{-1}$, $(b^3 + c^3)^{-1}$, $(c^3 + d^3)^{-1}$ are in-

(1) A.P. (2) G.P. (3) H.P. (4) None of these

Q.4 If a, b, c, d and p are distinct real numbers such that $(a^2 + b^2 + c^2)\, p^2 - 2p\,(ab + bc + cd) + (b^2 + c^2 + d^2) \le 0$ then a, b, c, d are in -

(1) A.P. (2) G.P. (3) H.P. (4) None of these

Q.5 The sum of first three terms of a G.P. is $\frac{39}{10}$ and their product is 1. Find the common ratio?

(1) $\frac{5}{3}$ or $\frac{3}{5}$ (2) $\frac{5}{2}$ or $\frac{2}{5}$ (3) 5 or $\frac{1}{5}$ (4) None of these

Q.6 The third term of a G.P is 4. The product of the first five terms is

(1) 4^3 (2) 4^5 (3) 4^4 (4) 4

Q.7 If S is the sum to infinity of a G.P. whose first term is 'a', then the sum of the first n terms is

(1) $S\left(1-\frac{a}{S}\right)^n$ (2) $S\left[1-\left(1-\frac{a}{S}\right)^n\right]$ (3) $a\left[1-\left(1-\frac{a}{S}\right)^n\right]$ (4) $S\left[1-\left(1-\frac{S}{a}\right)^n\right]$

Q.8 For a sequence $\{a_n\}$, $a_1 = 2$ and $\frac{a_{n+1}}{a_n} = \frac{1}{3}$. Then $\sum_{r=1}^{20} a_r$ is

(1) $\frac{20}{2}$ [4 + 19 × 3] (2) $3\left(1-\frac{1}{3^{20}}\right)$ (3) 2 $(1 - 3^{20})$ (4) $\left(1-\frac{1}{3^{20}}\right)$

Practice Section-03

Q.1 If p^{th}, q^{th} and r^{th} terms of H.P. are u, v, w respectively, then the value of the expression $(q-r)vw + (r-p)wu + (p-q)uv$ is-

(1) 1 (2) 0 (3) – 2 (4) – 1

Q.2 a, b, c are first three terms of a GP. If HM of a and b is 12 and that of b and c is 36, then a equals-

(1) 24 (2) 8 (3) 72 (4) 1/3

Q.3 If a, b, c in H.P. then value of $\left(\frac{1}{b}+\frac{1}{c}-\frac{1}{a}\right)\left(\frac{1}{c}+\frac{1}{a}-\frac{1}{b}\right)$ =

(1) $\frac{2}{bc}-\frac{1}{b^2}$ (2) $\frac{3}{b^2}-\frac{1}{ab}$ (3) $\frac{3}{ac}-\frac{2}{b^2}$ (4) None of these

Q.4 If $H_1, H_2, H_3, \ldots\ldots, H_n$ be n harmonic means between a and b then $\frac{H_1+a}{H_1-a}+\frac{H_n+b}{H_n-b}$ =

(1) 0 (2) n (3) 2n (4) 1

Q.5 If the $(m+1)^{th}$, $(n+1)^{th}$, $(r+1)^{th}$ terms of an A. P. are in G. P. and m, n, r are in H.P. then the ratio of common difference to the first terms in the A. P. is-

(1) n/2 (2) 2/n (3) – n/2 (4) – 2/n

Q.6 If d, e, f are in G.P. and two quadratic equations $ax^2 + 2bx + c = 0$ and $dx^2 + 2ex + f = 0$ have a common root then, d/a, e/b, f/c are in-

(1) H. P. (2) G. P. (3) A. P. (4) None of these

Q.7 $\frac{a^{n+1}+b^{n+1}}{a^n+b^n}$ is AM/GM/HM, between a and b if n is equal to respectively-

(1) $-1, -\frac{1}{2}, 0$ (2) $0, \frac{1}{2}, -\frac{1}{2}$ (3) $0, -\frac{1}{2}, -1$ (4) None of these

Q.8 If the 3rd, 6th and last term of a H.P. are , $\frac{1}{3}, \frac{1}{5}, \frac{3}{203}$ then the number of terms is equal to

(1) 100 (2) 102 (3) 99 (4) 101

Practice Section-04

Q.1 The sum of the series
$a-(a+d)+(a+2d)-(a+3d)+\ldots$ upto $(2n+1)$ terms is-
(1) – nd (2) a + 2 nd (3) a + nd (4) 2nd

Q.2 The sum to n terms of the series
$1+2\left(1+\frac{1}{n}\right)+3\left(1+\frac{1}{n}\right)^2+\ldots.$ is given by-
(1) n^2 (2) n (n+1) (3) $n(1+1/n)^2$ (4) None of these

Q.3 $1+2.2+3.2^2+4.2^3+\ldots.+100.2^{99}$ equals-
(1) 99.2^{100} (2) 100.2^{100} (3) $1+99.2^{100}$ (4) None of these

Q.4 If r^{th} term of a series is $(2r+1)2^{-r}$, then sum of its infinite terms is-
(1) 10 (2) 8 (3) 5 (4) 0

Q.5 Sum of the series 3 + 7 + 14 + 24 + 37 +...10 terms, is –
(1) 560 (2) 570 (3) 580 (4) None of these

Q.6 If $H_n = 1+\frac{1}{2}+\frac{1}{3}+\ldots\ldots\ldots+\frac{1}{n}$, then value of $1+\frac{3}{2}+\frac{5}{3}+\ldots\ldots\ldots+\frac{2n-1}{n}$ is
(1) $2n - H_n$ (2) $2n + H_n$ (3) $H_n - 2n$ (4) $H_n + n$

Q.7 The value of $\sum_{r=1}^{n}\frac{1}{\sqrt{a+r\ x}+\sqrt{a+(r-1)\ x}}$ is
(1) $\frac{n}{\sqrt{a}+\sqrt{a+nx}}$ (2) $\frac{n}{\sqrt{a}-\sqrt{a+nx}}$ (3) $\frac{\sqrt{a+nx}-\sqrt{a}}{2x}$ (4) $\frac{\sqrt{a}+\sqrt{a+n\ x}}{x}$

Q.8 Find the sum of the series: $\frac{1^2}{1}+\frac{1^2+2^2}{1+2}+\frac{1^2+2^2+3^2}{1+2+3}+\ldots\ldots$ upto 31 terms.
(1) 441 (2) 341 (3) 541 (4) None of these

ANSWER KEY

PRACTICE SECTION-01

Que.	1	2	3	4	5	6	7	8
Ans.	2	1	1	2	3	4	4	3

PRACTICE SECTION-02

Que.	1	2	3	4	5	6	7	8
Ans.	3	3	2	2	2	2	2	2

PRACTICE SECTION-03

Que.	1	2	3	4	5	6	7	8
Ans.	2	2	1	3	4	1	3	1

PRACTICE SECTION-04

Que.	1	2	3	4	5	6	7	8
Ans.	3	1	3	3	2	1	1	2