VERY SHORT ANSWER TYPE QUESTIONS

1. Find the sum of indicated numbers of terms of each of the following GP:

   (i) $1, \dfrac{2}{3}, \dfrac{4}{9}, \cdots, n$ terms

   (ii) $x^3, x^5, x^7, \cdots, n$ terms $(x \neq \pm 1)$

   (iii) $\sqrt{7}, \sqrt{21}, 3\sqrt{7}, \cdots, n$ terms

   (iv) $1, -a, a^2, \cdots, n$ terms $(a \neq -1)$.

2. Find the sum of the following series:

   (i) $\sqrt{2} + 2 + \sqrt{8} + \cdots$ 12 terms

   (ii) $\dfrac{1}{4} + \dfrac{1}{2} + 1 + \cdots n$ terms

   (iii) $0.15 + 0.015 + 0.0015 + \cdots$ 20 terms

   (iv) $2 - \dfrac{1}{2} + \dfrac{1}{8} + \cdots$ 12 terms.

3. Find the following sums:

   (i) $\sqrt{3} + 3 + 3\sqrt{3} + \cdots + 729$

   (ii) $\dfrac{2}{9} - \dfrac{1}{3} + \dfrac{1}{2} - \cdots + \dfrac{81}{32}$.

LONG ANSWER-I TYPE QUESTIONS

4. Given a GP with first term $= 729$, $T_7 = 64$; determine S_7.

5. (i) How many terms of the sequence $3, 3^2, 3^3, \cdots$ are needed to give the sum 120?

   (ii) How many terms of the GP $3, 3/2, 3/4, \cdots$ are needed to give the sum 3069/512?

6. Evaluate the following:

   (i) $\displaystyle\sum_{j=1}^{11}(2 + 3^j)$

   (ii) $\displaystyle\sum_{j=1}^{8}(2^j + 3^{j-1})$.

7. If $a + b + \cdots + l$ is a geometric series, show that its sum is $\dfrac{bl - a^2}{b - a}$.

8. (i) The fourth and seventh terms of a GP are 1/27 and 1/729 respectively. Find the sum of n terms of the GP.

Very Short Answer Type Questions

1. (i) Find the GM between $\dfrac{8}{9}$ and $\dfrac{49}{50}$.

   (ii) Find the GM between 0.008 and 0.2.

2. The GM between two positive numbers is 16. If one number is 32, find the other number.

Long Answer-I Type Questions

3. If $k - 1$ is the GM between $k - 2$ and $k + 1$, then find the value of k.

4. If a, b, c, d are four distinct positive quantities in AP, then show that $bc > ad$.

5. If a, b, c, d are four distinct positive quantities in GP, then show that $a + d > b + c$.

6. If A and G be the AM and GM between positive numbers a and b respectively, then show that a and b are the roots of the equation $x^2 - 2Ax + G^2 = 0$.

7. If a, b, c are in AP, x is the GM between a and b, y is the GM between b and c, show that b^2 is the AM between x^2 and y^2.

8. Find two positive numbers whose difference is 2 and whose AM exceeds the GM by 1/2.

9. If the AM between two positive numbers exceeds their GM by 2 and the ratio of the numbers be 1 : 4, find the numbers.

10. The AM between two positive numbers, whose sum is 100, is to their GM as 5 : 4. Find the numbers.

Long Answer-II Type Questions

11. If AM and GM of two positive numbers a and b are 10 and 8 respectively, find the numbers.

12. Insert two numbers between 3 and 81 so that the resulting sequence is a GP.

13. Insert 3 GM's between 1 and 256.

14. Insert 6 GM's between 1 and 2187.

15. Insert 4 GM's between 1/9 and 27 and verify that their product is equal to the fourth power of the GM between 1/9 and 27.