PRACTICE PAPER

ICSE CLASS 10 – MATHEMATICS

Chapter 11 : Geometric Progression

(Algebra)

Maximum Marks: 40 ***Time allowed: One and a half hours***

1. *Answers to this Paper must be written on the paper provided separately.*
2. *You will not be allowed to write during the first 10 minutes. This time is to be spent in reading the question paper.*
3. ***The time given at the head of this Paper is the time allowed for writing the answers.***
4. *Attempt* ***all*** *questions from* ***Section A*** *and* ***any two*** *questions from* ***Section B****.*
5. ***All working, including rough work, must be clearly shown, and must be done on the same sheet as the rest of the answer.***
6. ***Omission of essential working will result in loss of marks.***
7. *The intended marks for questions or parts of questions are given in brackets [ ].*
8. *Notation: a = first term, r = common ratio, t_n = nth term, S_n = sum of the first n terms of a G.P.*

SECTION A (20 Marks)

*(Attempt **all** questions from this Section.)*

Question 1

Choose the correct answers to the questions from the given options. [8]

(Do not copy the question, write the correct answers only.)

(i) Which of the following sequences is a G.P.?

(a) 2, 6, 18, 54, …
(b) 1, 4, 9, 16, …
(c) 3, 5, 7, 9, …
(d) 1, 2, 4, 7, …

(ii) The 6th term of the G.P. 3, 6, 12, … is:

(a) 48
(b) 96
(c) 192
(d) 72

(iii) The common ratio of the G.P. 81, −27, 9, −3, … is:

(a) 3
(b) −3
(c) 1/3
(d) −1/3

(iv) **Assertion (A):** The sum to infinity of the G.P. $1 + \frac{1}{2} + \frac{1}{4} + \ldots$ is 2.

Reason (R): The sum to infinity of a G.P. with first term a and common ratio r, $|r| < 1$, is $a/(1 - r)$.

(a) (A) is true and (R) is false.
(b) (A) is false and (R) is true.
(c) Both (A) and (R) are true, and (R) is the correct explanation for (A).
(d) Both (A) and (R) are true, but (R) is not the correct explanation for (A).

(v) The geometric mean between 16 and 25 is:

(a) 18
(b) 20.5
(c) 20
(d) 25

(vi) The sum of the first 6 terms of the G.P. 2, 6, 18, … is:

(a) 364
(b) 728
(c) 1456
(d) 726

(vii) A G.P. has first term 2, common ratio 3 and last term 162. The number of terms is:

(a) 5
(b) 6
(c) 7
(d) 8

(viii) **Assertion (A):** If a, b and c are in G.P., then $2b = a + c$.

Reason (R): If a, b and c are in G.P., then $b^2 = ac$.

(a) (A) is true and (R) is false.
(b) (A) is false and (R) is true.
(c) Both (A) and (R) are true, and (R) is the correct explanation for (A).
(d) Both (A) and (R) are true, but (R) is not the correct explanation for (A).

Question 2

(i) The 3rd term of a G.P. is 12 and its 6th term is 96. Find the first term and the common ratio. Hence find the 8th term. [4]

(ii) Find the sum of the first 8 terms of the G.P. 5, −10, 20, −40, … [4]

(iii) The second term of an infinite G.P. is 3 and its sum to infinity is 16. Find the possible values of the first term. [4]

SECTION B (20 Marks)

*(Attempt **any two** questions from this Section.)*

Question 3

(i) Which term of the G.P. −3, 6, −12, 24, … is −192? [3]

(ii) Find the G.P. whose 2nd term is 6 and whose 5th term is 162. [3]

(iii) Insert three geometric means (all terms positive) between 5 and 80. Hence find the sum of the five terms of the G.P. so formed. [4]

Question 4

(i) Find the 4th term from the end of the G.P. 1, 3, 9, …, 729. [3]

(ii) Find the sum of the G.P. 2 + 6 + 18 + … + 1458. [3]

(iii) How many terms of the G.P. 3, 6, 12, … must be taken so that their sum is 381? [4]

Question 5

(i) The sum of three numbers in G.P. is 14 and their product is 64. Find the numbers. [3]

(ii) If a, b and c are in G.P., prove that $(a^2 + b^2)(b^2 + c^2) = (ab + bc)^2$. [3]

(iii) Express the recurring decimal 0.3545454… as a fraction in its lowest terms, using the sum of an infinite G.P. [4]

Question 6

(i) A boy saves ₹ 1 on the first day, ₹ 2 on the second day, ₹ 4 on the third day, and so on, doubling the amount every day. In how many days will his total savings be ₹ 1,023? [3]

(ii) The sum of an infinite G.P. is 15 and the sum of the squares of its terms is 45. Find the first term and the common ratio. [3]

(iii) If a, b, c and d are in G.P., prove that $(b - c)^2 + (c - a)^2 + (d - b)^2 = (a - d)^2$. [4]

— End of Question Paper —