Mathematics — Ganita Manjari

Chapter 11 Test 1

The World of Algorithms

Class IX | 2026–27

Time Allowed: 45 Minutes | Maximum Marks: 25

General Instructions

1. All 13 questions are compulsory. Choose one option in A; show working in B–D.
2. No calculators. Give exact answers unless an approximation is requested.
3. Unless stated otherwise, inputs are positive integers. Give precise algorithm steps.

SECTION A

(5 questions × 1 mark = 5 marks)

1. Which description best defines an algorithm?

(A) A single numerical answer
(B) A precise step-by-step procedure
(C) A list of symbols only
(D) An untested guess

2. When adding two base-ten digits and an incoming carry of at most 1, the outgoing carry can be:

(A) Only 0
(B) Only 2
(C) 0 or 1
(D) 1 or 2

3. In written addition, why are whole numbers aligned from the right?

(A) To match equal place values
(B) To put larger digits together
(C) To remove every zero
(D) To avoid all carries

4. Which item is a list used as a data structure?

(A) The instruction “stop”
(B) $7 + 5$
(C) A carry of 1
(D) [1, 2, 4, 8]

5. What is $29 \ mod \ 6$?

(A) 4
(B) 5
(C) 6
(D) 23

SECTION B

(4 questions × 2 marks = 8 marks)

6. Add 4786 and 2657 by the digit algorithm. State the outgoing carry after each column, starting with units.

7. An addition rule handles totals less than 10 and greater than 10, but no other case. Explain the defect using $6 + 4$, and correct the rule.

8. The divisor algorithm scans 1 to 15. Give its list just after testing 5 and its final list. Explain why testing 4 does not change the list.

9. Two divisor lists are [6, 1, 3, 2] and [1, 4, 2, 8]. Find the GCD by comparing them. Explain how to select the answer without assuming an order.

SECTION C

(3 questions × 3 marks = 9 marks)

10. Describe an algorithm for adding two non-negative terminating decimals. Apply it to $12.48 + 3.705$.

11. Explain why replacing a column total $s = 10c + r$, where $0 \leq r < 10$, by digit r and carry c preserves the value of the sum.

12. Use the division algorithm to find $gcd(252,198)$. Show every division until the remainder is zero.

SECTION D

(1 application question × 3 marks = 3 marks)

13. A teacher has 96 pencils and 144 erasers. All items must be placed in the greatest possible number of identical kits. Find the number of kits and the contents of each, using a GCD algorithm.