Mathematics — Ganita Manjari

Chapter 11 Test 2

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. An addition program processes the two columns of $49 + 51$ but discards the carry left after the tens column. What result does it display?

(A) 0 (B) 10
(C) 90 (D) 100

2. To avoid unnecessary candidates, where does the chapter's direct common-divisor scan stop for positive inputs m, n?

(A) $m + n$ (B) mn
(C) $min(m, n)$ (D) $max(m, n) + 1$

3. For a positive integer a, what is $gcd(a, 0)$?

(A) 0 (B) 1
(C) $2a$ (D) a

4. Before calculating $m \ mod \ n$ in the division algorithm, which condition must be checked?

(A) Whether m is even
(B) Whether $n = 0$
(C) Whether $m + n = 10$
(D) Whether m is prime

5. A column has digits 2 and 3 and incoming carry 1. What must the outgoing carry be?

(A) 0 (B) 1
(C) 2 (D) 6

SECTION B

(4 questions × 2 marks = 8 marks)

6. A written addition algorithm assumes that both input numbers have a digit in every column. Repair it for a five-digit number plus a three-digit number, using $50672 + 938$.

7. Counting one dot takes 1 second; processing one digit column takes 15 seconds. Compare the times for $27 + 43$ and $2700 + 4300$ by both methods.

8. Find digits a and b in the addition shown in figure. Explain the carries used.

$$\begin{array}{r} 4\ 8\ a\ 7 \\ +\ 2\ b\ 6\ 8 \\ \hline 7\ 6\ 2\ 5 \end{array}$$

9. A student extends the two-number rule to three addends but still allows only carry 0 or 1. Use $9 + 9 + 9$ to show what must change.

SECTION C

(3 questions × 3 marks = 9 marks)

10. For a positive integer k, explain what happens when 1 is added to a number consisting of k consecutive 9s. State the number of column additions.

11. A student adds 58 and 67 by adding tens first, then units, and concatenating the column totals: 11 followed by 15. Explain the error and repair the result.

12. For two whole-number inputs, write a corrected digit-addition algorithm that includes missing digits, equality to 10, and a final carry.

SECTION D

(1 application question × 3 marks = 3 marks)

13. A shop adds bills of ₹28.65, ₹7.90 and ₹3.45. A cashier reports ₹38.200 by adding the rupee and paise columns separately. Correct the bill and explain the regrouping.