M.C.A. Sem (I) End Term Practical Examination 2025-26

CS108: Data Structures and Algorithms

1.	The n consecutive integers from 1 to n are written in a row. Design an algorithm that puts signs "+" and "−" in front of them so that the expression obtained is equal to 0 or, if the task is impossible to do, returns the message "no solution."
2.	You have to paint $n \geq 1$ metallic plates using a painting machine. The painting machine can paint at most two metallic plates at a time. Each metallic plate has two sides (front and back) that must be painted. Painting one side takes exactly 1 minute. The painting time is the same whether one or two plates are painted simultaneously. Write a program that computes the minimum possible time to paint all n metallic plates in. What is the time complexity of your algorithm.
3.	Write a program to implement the Quick Sort algorithm by selecting the last element as the pivot. For an array of 10 elements, program should demonstrate why the sorted input results in the worst-case time complexity of Quick Sort.