

Non-Objective Questions for Sessions 1 to 6

Each question below requires you to write an **algorithm**, **pseudocode**, and draw a **flowchart** to solve the given problem. Ensure your solutions use **loops** (while, for, or do-while) and **structured programming** principles (e.g., modularity with procedures, clear control structures). Use proper pseudocode syntax and standard flowchart symbols (oval for start/end, parallelogram for input/output, rectangle for process, diamond for decision).

Question 1: Sum of Even Numbers

Problem: Calculate the sum of all even numbers from 1 to a user-input positive integer n using a modular approach. Use a procedure to check if a number is even.

Question 2: Average of Positive Numbers

Problem: Compute the average of positive numbers entered by the user until a negative number is input. Use a procedure to validate inputs and a while loop.

Question 3: Password Validation

Problem: Create a program that repeatedly prompts for a password until the correct one ("secure123") is entered, using a do-while loop and a procedure to check the password.

Question 4: Ticket Sales Counter

Problem: Simulate selling a user-specified number of tickets, using a for loop and a procedure to process each sale. Output "Ticket sold" for each sale and "All tickets sold" at the end.

Question 5: Grade Report Generator

Problem: Generate a grade report for 5 students, calculating each student's average score from 3 tests and assigning a letter grade (A: ≥ 90 , B: ≥ 80 , C: ≥ 70 , D: ≥ 60 , F: < 60). Use procedures for calculating the

average and assigning the grade, with a for loop.

Question 6: Shopping Cart Total

Problem: Calculate the total cost of items in a shopping cart, where the user inputs item prices until a negative price is entered. Use a while loop and procedures to calculate the subtotal and apply a 10% discount if the subtotal exceeds \$100.

Question 7: Temperature Monitor

Problem: Monitor temperatures for 7 days, using a for loop and a procedure to check if each temperature exceeds 30°C. Output an alert for high temperatures and a summary of how many days had high temperatures.