SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN
(AUTONOMOUS)
(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai - 600 044.
B.Sc.Computer Science - END SEMESTER EXAMINATIONS - NOV'2024
SEMESTER - I
23UCSCT1001 - Problem Solving through Programming in C

Total Duration : 2 Hrs.30 Mins. Total Marks : 60

Section B

Answer any **SIX** questions $(6 \times 5 = 30$ Marks)

1. Illustrate the essential characteristics of a good algorithm? Provide at least four characteristics.
2. Explain the different phases of problem-solving in software development. Discuss how each phase contributes to the overall software development lifecycle.
3. Write and explain three different approaches to find the largest of three numbers, including using conditional operators, if-else statements, and a function. Compare their efficiency.
4. Write a program in C using nested if-else statements to find whether a given year is a leap year.
5. Differentiate between tokens, identifiers, and keywords in C. Provide examples.
6. Write a program in C to declare and initialize a one-dimensional array. How can you access its elements?
7. What is dynamic memory allocation in C? Explain the use of malloc() and free() functions with an example.
8. Write a C program using an array of pointers to store and display multiple strings.

Section C

Answer any **THREE** questions $(3 \times 10 = 30$ Marks)

9. Explain in detail the different types of programming methodologies and Compare the advantages and disadvantages of Procedural, Object-Oriented, and Functional programming approaches.
10. Discuss and compare recursive and iterative approaches for computing the factorial of a number and provide code for both and analyze their time and space complexities.

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11. Compare the for, while, and do-while loops in C and demonstrates each loop with an example and explain their differences.

12. a) Explain the concept of two-dimensional arrays in C.
    b) Write a program to perform matrix addition or matrix multiplication using two-dimensional arrays and explain the process.

13. Solve the problem of managing a database of student information by a C program
    a) Use nested structures and arrays of structures.
    b) The database should store each student's personal details such as name, ID, and age along with their academic records such as course name, marks, and grade.

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