Registration No.: | | | | | | | | | | |

Total Number of Pages: 02 **Course: B.Tech/IDD**
Sub_Code: 23ES1003

1st Semester Regular/Back Examination: 2025-26
SUBJECT: Programming in C and Data Structure
BRANCH(S): CE, AE, AEIE, AERO, AI, AIML, AME, AUTO, BIOMED, BIOTECH, CHEM, CIVIL, CS, CSE, CSE(CS), CSEAI, CSEAIML, CSEDS, CSIT, CST, ECE, EEE, ELECTRICAL, ELECTRICAL & C.E., ENV, ETC, IT, MANUTECH, MECH, METTA, MINING, MME, MMEAM, PLASTIC
Time: 3 Hours
Max Marks: 100
Q.Code: U639
Answer Q1 (Part-I) which is compulsory, any eight from Part-II, and any two from Part-III.
The figures in the right-hand margin indicate marks.

Part-I

Q1 **Answer the following questions:** **(2 x 10)**

a) Differentiate between for and do-while loops with an example.
b) Distinguish between binary search and linear search.
c) Explain the difference between structure and union.
d) What is a variable? How do we declare a variable in C?
e) Define conditional operator along with its syntax.
f) Differentiate between branching and looping with an example.
g) Define a static variable. When can we use it? Give an example.
h) Distinguish between pointer to array and array of pointers.
i) Differentiate between a stack and a queue along with their applications.
j) Explain about calloc() and realloc() functions.

Part-II

Q2 **Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve)** **(6 x 8)**

a) Write a C program to add two numbers using recursion.
b) Differentiate between bubble sort and quick sort. Which one is better and why? Give an example.
c) Explain different kinds of operators in C.
d) Write a C program to reverse a string without using **strrev()** function.
e) What is pseudo-code? Explain with an example.
f) Draw a flowchart and write the algorithm to compute the simple interest.
g) Write a C program to print the numbers from 4 to 10 and their squares.
h) Write a C program to check whether a given number is a palindrome or not.
i) Write a C program that takes the three coeficients of a quadratic equation and compute all possible roots and print them with appropriate messages.

j) What is dangling else problem? Explain how to handle this with an example.

k) Write a C program to read 20 numbers into an array and compute their average.

l) Explain array of structure and structure within structure with an example.

Part-III

Only Long Answer Type Questions (Answer Any Two out of Four)

Q3 Discuss the advantage of "switch-case" statement in C. Write a C program using switch-case to design a calculator. **(16)**

Q4 Define recursion. Write a C program for multiplying two integers using recursion. **(16)**

Q5 Write a C program using pointers to compute the sum, mean and standard deviation of all the 30 elements stored in an array. **(16)**

Q6 Construct a binary search tree with the following sequence: **(16)**
B, R, A, N, C, H, E, and S.