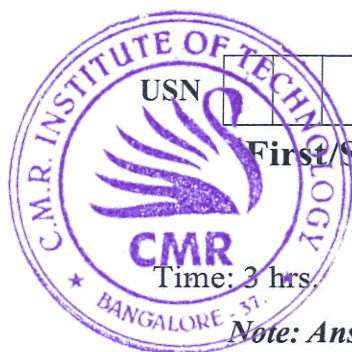


CBCS SCHEME



17PCD13/23

First/Second Semester B.E. Degree Examination, Jan./Feb. 2023 Programming in C and Data Structures

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. What are data types? Mention the different data types supported by C language, giving an example to each. (05 Marks)
- b. What is an operator? List and explain various types of operators. (10 Marks)
- c. Write C expressions to the following :
 - i) $s = \sqrt{s(s-a)(s-b)(s-c)}$
 - ii) $D = x^{25} + y^{35}$
 - iii) $A = \frac{5x + 3y}{a + b}$
 - iv) $\text{disc} = b^2 - 4ac$
 - v) $X = \frac{-b + \sqrt{b^2 - 4ac}}{2a}$(05 Marks)

OR

- 2 a. What is Pseudocode? Write pseudocode, algorithm for area of circle and rectangle. (05 Marks)
- b. Explain variables in C. List the rules for naming the variables. Classify the following into valid and invalid variables. If invalid give reasons.
 - i) ___apple
 - ii) i.b.m
 - iii) INT(08 Marks)
- c. Write a structure of C program? Explain type conversion with its types. (07 Marks)

Module-2

- 3 a. What are two-way selection? Explain if, if-else, nested if-else, cascaded if-else with syntax and examples. (10 Marks)
- b. Design and develop a C program to read a year as an input and find whether it is leap year or not. (05 Marks)
- c. Explain the use of break, continue and goto statements in loops with an example. (05 Marks)

OR

- 4 a. Differentiate between while and do-while looping statements. (05 Marks)
- b. Explain switch statements. Write a C program that asks user an arithmetic operator (+, -, *, /) and two operands. Perform the corresponding arithmetic operation on the operands using switch statement. (10 Marks)
- c. Write a C program to print Sum of first 50 natural numbers using for loop. (05 Marks)

Module-3

- 5 a. Define an array. Explain how to declare and access multi-dimensional array with example. (08 Marks)
- b. Write a C program to illustrate the use of strcpy() and strcmp(). (08 Marks)
- c. Explain actual parameters and formal parameters with an example. (04 Marks)

OR

- 6 a. Explain different argument passing mechanisms in functions. (08 Marks)
- b. What is a function? Write a C program to find sum of two numbers using function. (06 Marks)
- c. Explain void and parameterless functions with an example. (06 Marks)

Module-4

- 7 a. What is structure? Explain with an example how to create a structure using 'typedef'. (05 Marks)
b. Explain array of structures and structures within a structure with examples. (10 Marks)
c. Write a C program to read and display text from the file. (05 Marks)

OR

- 8 a. What is a file? Explain how the file open and file close functions. (10 Marks)
b. Write a C program to maintain a record of "n" student details using an array of structures with four fields roll_number, name, marks and grade. Each field is of an appropriate data type. Print the marks of the student given student name as input. (10 Marks)

Module-5

- 9 a. What is dynamic memory allocation? Write different dynamic memory allocation functions in C with syntax. (06 Marks)
b. Explain different types of preprocessor directives in C. (06 Marks)
c. Define Stack and Queue. Explain them with its operations. (08 Marks)

OR

- 10 a. What is a pointer? Explain how the pointer variables declared and initialized. (06 Marks)
b. What is data structure? Explain its classifications. (06 Marks)
c. Write a C program to swap two numbers using call by reference. (08 Marks)
