CBCS SCHEME

USN | | | | | | | | | |

17PCD13/23

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

Time: 3 hrs. 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) $disc = b^2 - 4ac$ 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)

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