CBCS SCHEME

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17PCD13/23

First/Second Semester B.E. Degree Examination, June/July 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 is Pseudocode? Explain with example. **(04 Marks)**

b. Explain the different input and output functions in C with syntax and examples. **(06 Marks)**

c. What is an Operator? List and explain the various types of operators used in C program. **(10 Marks)**

OR

2 a. Explain the general structure of C program with example. **(08 Marks)**

b. Convert the following mathematical expression into 'C' equivalent :

(i) $\text{area} = \sqrt{s(s-a)(s-b)(s-c)}$

(ii) $x = \dfrac{-b + \sqrt{b^2 - 4ac}}{2a}$

(iii) $y = \dfrac{\alpha + \beta}{\sin\theta} + |x|$

(iv) $\dfrac{e^{|a|+b}}{x+y}(2x+3)$ **(04 Marks)**

c. Draw a flowchart and write a C program to find area and perimeter of a circle. **(08 Marks)**

Module-2

3 a. Explain if, if-else and nested if-else with examples and syntax. **(06 Marks)**

b. Write a C program to find the reverse of an integer number and check whether it is palindrome or not. **(06 Marks)**

c. Explain the different loops in 'C' language with syntax and examples. **(08 Marks)**

OR

4 a. What are unconditional control statements? Explain with examples. **(08 Marks)**

b. Explain switch statement with an example. **(06 Marks)**

c. Write a C program to check the given number is prime or not. **(06 Marks)**

Module-3

5 a. What is an array? Explain the declaration and initialization of one dimensional and two dimensional array with examples. **(08 Marks)**

b. Write a C program to search a name in a list of names using binary search technique. **(08 Marks)**

c. Define the following :

(i) Actual parameter
(ii) Formal parameter
(iii) Global variable
(iv) Local variable. **(04 Marks)**

OR

6 a. What is function? Explain the types of function based on parameters with examples. **(08 Marks)**

b. Explain any four string manipulation library functions with examples. **(08 Marks)**

c. Write a C program to find factorial of the given number using recursion. **(04 Marks)**

Module-4

7 a. What is structure? How structure is different from an array? Explain declaration and initialization of structure with syntax and example. **(08 Marks)**

b. Write a C program to pass structure variable as function argument. **(07 Marks)**

c. What is a file? Explain fopen and fclose functions. **(05 Marks)**

OR

8 a. Write a C program to read the contents from the file called abc.txt, count the number of characters, number of lines and number of white spaces and output the same. **(10 Marks)**

b. Explain with an example how to create a structure using "typedef". **(05 Marks)**

c. Explain fprintf and fscanf functions with syntax. **(05 Marks)**

Module-5

9 a. What is Pointer? Write a C program using pointer to find the sum, mean and standard deviation of all elements stored in an array of 'n' real numbers. **(08 Marks)**

b. What is preprocessor directive? Explain any two preprocessor directive in C with examples. **(06 Marks)**

c. Explain the following C functions with syntax and example:
   (i) malloc ( )
   (ii) calloc ( )
   (iii) realloc ( ) **(06 Marks)**

OR

10 a. Explain the array of pointers with example. **(04 Marks)**

b. What are primitive and non-primitive data types? Explain. **(06 Marks)**

c. Explain the following data structures along with their applications:
   (i) Stack
   (ii) Queue
   (iii) LinkedList
   (iv) Trees **(10 Marks)**

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