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15PCD13/23

**First/Second Semester B.E. Degree Examination, Feb./Mar. 2022**

## **Programming in C and Data Structures**

Time: 3 hrs.

Max. Marks: 80

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

### Module-1

- 1 a. Explain the structure of a C program. (08 Marks)  
b. Classify the operators based on the number of operands. (04 Marks)  
c. Evaluate the following expressions independent of each other.  
int i = 5, j = 6, k = 4 ;  
i) ++k% --j  
ii) j + i/1 - i (04 Marks)

**OR**

- 2 a. Explain the primitive Data types available in C. (06 Marks)  
b. With a neat syntax, explain printf( ) statement. Explain how the integer, character and the floating point number can be displayed using printf( ) statement. (05 Marks)  
c. Write a C program to find the area of a triangle when the lengths of three sides are given  
$$\text{Area} = \sqrt{s(s-a)(s-b)(s-c)}, \text{ where } s = \frac{(a+b+c)}{2}$$
 (05 Marks)

### Module-2

- 3 a. With a neat syntax, explain the switch statement. (08 Marks)  
b. Write a C program to find the square root of a given number N. (08 Marks)

**OR**

- 4 a. With a neat syntax, explain any two looping statements. (06 Marks)  
b. Explain the following statements with one example for each : goto and continue. (04 Marks)  
c. Write a C program to find the roots of a quadratic equation. (06 Marks)

### Module-3

- 5 a. Explain the different parts of the function definition. (06 Marks)  
b. Define string. Explain declaration and initialization of string. (04 Marks)  
c. Write a C program to read a sentence and print the number of vowels and consonants. (06 Marks)

**OR**

- 6 a. What is an Array? Explain one dimensional and two dimensional arrays. (06 Marks)  
b. Explain any two string manipulation functions. (04 Marks)  
c. Define Recursion. Write a C program to find factorial of a number using Recursion. (06 Marks)

### Module-4

- 7 a. What is the need of typedef? Explain with a neat syntax the form of a typedef for a structure. (06 Marks)  
b. Explain the file handling functions. (04 Marks)  
c. Explain structure within a structure with example. (06 Marks)

OR

- 8 a. What is structure? With neat syntax and example, explain the structure definition and declaration. (06 Marks)
- b. Given two university information files "studentname.txt" and "usn.txt" that contains student Name and USN respectively. Write a C program to create a new file called "output.txt" and copy the content of files "studentname.txt" and "usn.txt" into output file in the sequence shown below. Display the contents of output file "output.txt".

| Student Name | USN   |
|--------------|-------|
| Name 1       | USN 1 |
| Name 2       | USN 2 |
| :            | :     |
| :            | :     |

(10 Marks)

Module-5

- 9 a. Define stack, Queue and Linked list. (06 Marks)
- b. Write a C program using pointers to compute the sum, mean and standard deviation of all elements stored in an array of a real numbers. (10 Marks)

OR

- 10 a. What is dynamic memory allocation? Explain any two Dynamic memory allocation functions. (06 Marks)
- b. Define pointers. Explain how the variable can be accessed through its pointer. (04 Marks)
- c. Write a C program to swap two variables using pointer and function. (06 Marks)

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