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15PCD13/23

**First/Second Semester B.E. Degree Examination, Dec.2016/Jan.2017**
**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. Define an Algorithm. Write an algorithm to find the area and perimeter of a rectangle. (06 Marks)
- b. Write a General structure of C. Explain with an example. (06 Marks)
- c. Convert the following mathematical expression into C equivalent:
- i)  $\text{area} = \frac{Vs(s-a)(s-b)(s-c)}{2a}$  (06 Marks)
- ii)  $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$  (06 Marks)

OR

- 2 a. Explain different types of input output functions in C with syntax and examples. (06 Marks)
- b. Explain the following operators :
- i) Unary (06 Marks)
- ii) Bitwise (06 Marks)
- iii) Conditional. (06 Marks)
- c. Draw the flowchart and write a C program to compute simple interest. (04 Marks)

**Module-2**

- 3 a. List all the conditional control statements used in C. Explain any two with syntax and example. (06 Marks)
- b. Write a C program that reads from the user an arithmetic operator and two operands perform the corresponding arithmetic operation on the operands using switch statement. (06 Marks)
- c. Implement a C program to find the reverse of an integer number and check whether it is palindrome or not. (04 Marks)

OR

- 4 a. What are unconditional control statements? Explain any two with example. (06 Marks)
- b. List the types of looping statements in C. Explain any two with syntax and example. (06 Marks)
- c. Develop a C program to read a year as an input and find whether it is Leap year or not. (04 Marks)

**Module-3**

- 5 a. What is Array? Explain the declaration and initialization of one dimensional and two dimensional Array with example. (06 Marks)
- b. Explain any four string manipulation library function with example. (04 Marks)
- c. Write a C program to implement string copy operation STRCOPY (str1, str2) that copies a string str1 to another string str2 without using Library function. (06 Marks)

**15PCD13/23****OR**

- 6 a. What is string? Write a C program that reads a sentence and prints the frequency of each of the vowels and total count of consonants. (06 Marks)
- b. What is a Function? Explain the type of functions based on parameters. (06 Marks)
- c. What is Recursion? Write a C program to compute polynomial co-efficient  $-C_r$  using Recursion. (04 Marks)

**Module 4**

- 7 a. What is structure? Explain the C Syntax of structure declaration with example. (04 Marks)
- b. What is a FILE? Explain any five file manipulation functions with example. (06 Marks)
- c. What are actual and formal parameters? Explain various storage classes available in C. (06 Marks)

**OR**

- 8 a. Explain array of structure and structure within a structure with an example. (06 Marks)
- b. Write a C program to maintain a record of 'n' students details using an array of structures with four fields (roll no, name, marks and grade). Assume appropriate data type for each field. Print the marks of the student given the student name as input. (06 Marks)
- c. Explain various modes of FILE with example. (04 Marks)

**Module 5**

- 9 a. What is a pointer? Explain how the pointer variable is declared and initialized. (04 Marks)
- b. What is dynamic memory allocation? Explain different dynamic memory allocation functions in C. (06 Marks)
- Write a C program using pointers to compute the Sum, Mean and Standard deviation of all elements stored in an array of 'n' real numbers. (06 Marks)

**OR**

- 10 a. Explain the Array of pointers with example. (04 Marks)
- b. Explain any two pre-processor directives in C. (04 Marks)
- c. What is Stack? Explain operations on Stack. (04 Marks)
- d. What is a Queue? Explain its applications. (04 Marks)