CBCS Scheme

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First/Second Semester B.E. Degree Examination, Dec.2017/Jan.2018
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. What is a variable? Explain the rules for constructing variables in C language. Give examples for valid and invalid variables. **(06 Marks)**

   b. Write C expressions corresponding to the following (Assume all quantities are of same type):

   i) $A = \dfrac{-b + \sqrt{b^2 - 4ac}}{2a}$ ii) $B = e^{|x+y-20|}$ iii) $C = \dfrac{x}{b+c} + \dfrac{y}{b-c}$

   iv) $D = \sqrt{2\pi n}$ v) $E = \sin\theta$ vi) $F = \sin\left(\dfrac{b}{\sqrt{a^2 + b^2}}\right)$ **(06 Marks)**

   c. Write a C program to find area of a circle. **(04 Marks)**

OR

2 a. List all the operators supported in C. Explain relational, logical and bitwise operators. **(08 Marks)**

   b. Write a C program to find area of a triangle, when we know the lengths of all three of its sides. **(08 Marks)**

Module-2

3 a. List all the conditional control statements used in C. Explain if...else and nested if statements with example for each. **(08 Marks)**

   b. Write a C program to simulate simple calculator that performs arithmetic operations using switch statement. Error message should be displayed, if any attempt is made to divide by zero. **(08 Marks)**

OR

4 a. Explain the different types of loops used in C with syntax and example for each. **(08 Marks)**

   b. Write a C program to find the sum of series $1 + x + x^2 + x^3 + \dots + x^n$. **(08 Marks)**

Module-3

5 a. What is an array? Explain different methods of initialization of single dimensional array. **(08 Marks)**

   b. Write a C program to sort the given array elements in ascending order by using bubble-sort. **(08 Marks)**

OR

6 a. Write a C program to compute the factorial of a given number 'n' using recursion. **(08 Marks)**

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

Module-4

7 a. Write a C program to input the following details of 'N' students using structure:
   Roll No: integer, Name : string, Marks : float, Grade : Char
   Print the names of the students with marks ≥ 70.0. **(08 Marks)**

   b. Explain the following file operations along with syntax:
   i) fopen( ) ii) fclose( ) iii) fscanf( ) iv) fprintf( ) **(08 Marks)**

OR

8 a. Write a C program to maintain a record of 'n' employee details using an array of structures with three fields (id, name, salary) and print the details of employees whose salary is above Rs.10,000. **(08 Marks)**

   b. Explain structure within a structure with an example. **(08 Marks)**

Module-5

9 a. Define a pointer. Explain with an example, the declaration and initialization of a pointer variable. **(06 Marks)**

   b. Develop a C program to read two numbers and function to swap these numbers using pointers. **(06 Marks)**

   c. Explain the following C functions along with syntax: i) malloc( ) ii) calloc( ) **(04 Marks)**

OR

10 a. Explain stack and queue data structures along with their applications. **(08 Marks)**

   b. Explain any four preprocessor directives in C language with example for each. **(08 Marks)**

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