

# CBCS Scheme

USN

--	--	--	--	--	--	--	--	--	--

15PCD13/23

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)  $A = \frac{-b + \sqrt{b^2 - 4ac}}{2a}$       ii)  $B = e^{|x+y-20|}$       iii)  $C = \frac{x}{b+c} + \frac{y}{b-c}$
- iv)  $D = \sqrt{2\pi n}$       v)  $E = \sin \theta$       vi)  $F = \sin\left(\frac{b}{\sqrt{a^2 + b^2}}\right)$  (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  $\geq 70.0$ . (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 detail 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)

\*\*\*\*\*