Code: CS3T3

II B.Tech - I Semester – Regular/Supplementary Examinations November - 2019

PROGRAM DESIGN
(COMPUTER SCIENCE & ENGINEERING)

Duration: 3 hours   Max. Marks: 70

PART – A

Answer *all* the questions.   All questions carry equal marks
$$11x\ 2 = 22\ M$$

1.

   a) Define library function and its usage in programming language?
   b) Define enumerated data type in C.
   c) Define life time and scope of a variable.
   d) Define array.
   e) Define union.
   f) How to access a 2-D array using pointers?
   g) Define binary file.
   h) Different storage classes in C.
   i) Difference between macros and functions in C.
   j) Define self-referential structure.
   k) How do you pass a pointer to a function?

PART – B

Answer any ***THREE*** questions. All questions carry equal marks.

$$3 \text{ x } 16 = 48 \text{ M}$$

2. a) Describe the top down design used in C language. Explain how the structured charts will be helpful in top down design?   8 M

   b) A cyclist coasting on a level road slows from a speed of 10 mi/hr to 2.5 mi/hr in one minute. Write a computer program that calculates the cyclist's constant rate of acceleration and determines how long the cyclist will take to come to rest, given an initial speed of 10 mi/hr.
   (Hint: Use the equation
   $$a=(V_f-Vi)/t$$
   where 'a' is acceleration, 't' is time interval , 'V_i' is initial velocity & 'V_f' is final velocity).Write and call a function that displays instructions to the program user and a function that computes 'a', given t, V_f and V_i.   8 M

3. a) Write a C program to find sum of array elements using recursion?   8 M

   b) Write a program to dispense change after payment by a customer in shopping mall. The operator enters the amount paid (in Rupees only).The program should determine how many denominations of Notes and Coins should be given as change.(Assume Note denominations of 200,100,50,10 and Coin denominations of 5,1 rupees).Write function with

output parameters that determines the quantity of each kind of Notes and Coins. 8 M

4. a) Write a C program for the sorting problem that sorts an array by counting, for each of its elements, the number of smaller elements and then uses this information to put the element in its appropriate position in the sorted array?

8 M

b) Write a C program to accept a string and find whether all the characters in the given string are distinct or not? 8 M

5. a) Write a C program to perform two dimensional matrix multiplication (size n*n) using pointers. 8 M

b) Explain the usage of Malloc, Calloc and Realloc dynamic memory allocation functions with a simple C programs.

8 M

6. Explain the Concept of macros in C with a simple Program. Explain macros with parameters and how to manage the complexity of large programs. 16 M