JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST.-3 EXAMINATION -2023

B.Tech.-I Semester (CSE/IT/ECE/CE/BT/BI)

COURSE CODE (CREDITS): 19B11CI111 (2) MAX. MARKS: 35

COURSE NAME: Programming for Problem Solving II

COURSE INSTRUCTORS: VSG, RBT, YGL, AVA, KUS, PVM, FAZ MAX. TIME: 2 Hour

Note: All questions are compulsory. Marks are indicated against each question in square brackets. Attempt all parts of a question together.

1. **[CO5, CO6] [2 + 2 + 2 + 1 = 7 Marks]**

a. Write a function **celsius_at_depth** to take a depth (in kilometers) inside the earth as input data; compute and display the temperature at this depth in degrees Celsius. The relevant formula is: *Celsius* = 10 × *depth* + 20 (Celsius temperature at depth in km). The function **celsius_at_depth** should compute and return the Celsius temperature at a depth measured in kilometers.

b. Write a function in C that will find the smallest element in an array.

c. Define a structure called address that contains character arrays streetAddress[25], city[20], state[3] and zipCode[6].

d. What data types would you use to represent the following items: number of children at school, a letter grade on an exam, the average number of school days a child is absent each year?

2. **[CO7] [2.5 + 2.5 + 1 + 1 = 7 Marks]**

a. Write a C program to search a given element from a one-dimensional array and display the position at which it is found.

b. Write a function to calculate the factorial of an integer quantity.

c. Can two elements of the same array be of different data types? Justify?

d. Suppose an integer quantity is added to or subtracted from a pointer variable. How will the sum or difference be interpreted?

3 **[CO3] [2 + 2 + 3 = 7 Marks]**

a. How is a structure member accessed in C?

b. What are the different ways to print character arrays in C? Illustrate with a code segments.

c. Define a single dimensional array of *N* integers using dynamic memory allocation. Next, write functions to enter the elements and find the sum of all the elements.

4 **[CO6] [3 + 3 + 1 = 7 Marks]**

a) Write the appropriate declarations for the following:
   i. Declare a pointer to a floating-point quantity, and a pointer to a double-precision quantity.
   ii. Declare a pointer to a function that accepts three integer arguments and returns a floating-point quantity.

b) Write a C program to perform the following:
   i. Write the name, age, and salary into file **emp.txt**
   ii. Read the data from file **emp.txt** and display on the screen.

c) Define a one-dimensional character array called point. Assign the string "NORTH" to the array elements. End the string with the null character.

5 **[CO8] [2.5 + 2.5 + 2 = 7 Marks]**

a. Write a recursive function **find_sum** that calculates the sum of successive integers starting at 1 and ending at n (i.e., **find_sum (n)** = (1 + 2 + . . . + (n -1) + n).

b. Write a C program to find length of a string (Do not use library function)

c. What is a primary difference between a structure and union?