



I SEMESTER B.TECH. (ALL BRANCHES)

END SEMESTER EXAMINATIONS, MARCH 2021

SUBJECT: PROBLEM SOLVING USING COMPUTERS [CSE 1051]

REVISED CREDIT SYSTEM

(13/03/2021)

Time: 3 Hours

Max. Marks: 50

Instructions to Candidates:

- Answer **ALL** questions & missing data may be suitably assumed.

- 1A i. Explain four classifications of computational problems. 2 M
- ii. Explain all the steps (phases) in a C program development with a neat diagram. 3 M
- 1B Write a flowchart to display perfect numbers between 1 and 500. 3 M
- 1C Write a C program to read N positive integers without using arrays and functions to find the second largest number among them. 2 M
- 2A Explain the various Bitwise operators with proper example. 5 M
- 2B Write a program to search n^{th} Fibonacci indexed number from the given list of 1D array. 3 M
- Ex: 1 D Array-- 34, 21, 11, 18, 21, 81, 57, 69, 97, 24
- 4^{th} Fibonacci number i.e. 2, so fetch array [2] = 11
- Fibonacci series: 0, 1, 1, 2, 3, 5, 8,.....
- 2C What is the largest number of key comparisons made by binary search in searching for a key in the following array? Show all the steps. 2 M
- | | | | | | | | | | | | | |
|---|---|----|----|----|----|----|----|----|----|----|----|----|
| 3 | 4 | 27 | 31 | 39 | 42 | 55 | 70 | 74 | 81 | 85 | 93 | 98 |
|---|---|----|----|----|----|----|----|----|----|----|----|----|
- 3A Write a single program to i) sort 'n' strings using selection sort method. 5 M
- ii) Eliminate the duplicate strings in the sorted list. [Do not use any additional array]
- 3B i. List the different ways of initializing pointers. Illustrate with examples. 2 M
- ii. Write a code snippet to swap the contents of two pointers. Note that the content of pointers are addresses. Assume integer pointers. 1 M
- 3C Differentiate between function declaration and function definition. Give the general syntax for defining a function 2 M

- 4A Write a C program to read a matrix of size $M \times N$ and display. The program must find and display the location of all the elements in the matrix which are both the largest element in its column and the smallest element in its row. Replace all such elements with the row average. If no such elements exist, then display appropriate message. 5 M

1	2	3
4	5	6
7	8	9

- 4B With appropriate example program code, explain how to return multiple values from a function using pointers. 3 M
- 4C Write a complete C program to read and print a string using pointer. 2 M
- 5A Write a C program to read a 2-dimensional integer array (matrix) **arr** of order $m \times n$ and display the array. Use a recursive function **rSoD(int)** to find the **sum of digits** of an odd element (value) from the array read above and replace the element with its sum. Using pointers write another function **dec2Bin (int *)** that takes as a parameter the sum of digits of odd elements computed above, replace it with its **binary equivalent** in the same 2-dimensional array, and display the array in matrix form in the main program. 5 M
- 5B Define a structure **EMPLOYEE** with the following members: **Employee_Number**, **Employee_Name**, **Basic**, **DA**, **IT**, **Net_Sal**. Write a C program to read data of N employees and print the same. Compute **DA**, **Gross**, and **Net_Sal** of each employee and print them. (**DA** = 52% of **Basic**, **gross**=**Basic** + **DA**, and **Income Tax (IT)** = 30% of the gross salary, **Net_sal**=**gross**-**IT**). 3 M
- 5C Explain any four classifications of cyber-crime where computers are used to commit the crime. 2 M