| VIT-AP UNIVERSITY | Continuous Assessment Test – Fall semester (2024-25) -August 2024 | |
|---|---|---|
| | Maximum Marks: 50 | Duration: 90 Mins |
| Course Code: CSE1022 | Course Title: Introduction to Programming | |
| Set No: 4 | Exam Type : Closed Book | School: SCOPE |
| Date: 31/8/2024 | Slot: F2+TF2 | Session: AN |

**Keeping mobile phone/smart watch, even in 'off' position is treated as exam malpractice**

**General Instructions if any Open Book/Open Notebook/Closed Book:**

1. **"*fx* series" - non Programmable calculator are permitted : YES**
2. **Reference tables permitted : NO**

**PART – A: Answer any ALL Questions, Each Question Carries 10 Marks (5×10=50 Marks)**

1. A perfect number is defined as a positive integer that can be expressed as the sum of its proper factors (factors except for the number itself). Write a program to accept a number. Check whether the given number is perfect number or not.

   **Hint: 6 is a perfect number.**
   **The factors of 6 are 1, 2, 3 and 6. We can write 6 = 1 + 2 + 3. The smallest perfect number is 6.**

   **(10M)**

2. Write a C Program to print the below pattern

```
1
2 2
3 3 3
4 4 4 4
3 3 3
2 2
1
```

   **(10M)**

3. You are tasked with creating a student directory for a university's programming class. The directory will include the names of students, and you need to organize them in alphabetical order. The university plans to use this directory for assigning project groups and for attendance purposes.

   Your task is to write a C program that accepts an array of student names and sorts them in alphabetical order.

   ***Input:*** *The program will first ask the user for the number of students in the class (maximum 70). Then it will prompt the user to enter the names of each student.*
   ***Sorting:*** *The program should sort the student names in alphabetical order (case-insensitive).*
   ***Output:*** *After sorting, the program should display the names in the new, sorted order.*

   **(10M)**

4. You are working on a project where you need to compute the trace of a matrix (the sum of the elements on the main diagonal) for various calculations. Implement a C program to

calculate the trace of a square matrix.

**Hint**:

**Input**: mat [][]={{1,2,3},{4,5,6},{7, 8, 9}};

**Output**: Trace=1+5+9=15

**(10M)**

5. You are working on a project where you need to calculate square, cube and square root of a number.

   Write C functions to calculate and return square, cube and square root(minimum 2 digits after the decimal point).

   Implement a C program that accepts a number X as input and call the above 3 functions by passing X as parameter to all the functions and print square, cube and square root of X.

   **(10M)**

**QP MAPPING**

| Q. No. | E/A/T | Module Number | Marks | BL | CO Mapped | PO Mapped | PEO Mapped | PSO Mapped |
|---|---|---|---|---|---|---|---|---|
| Q1 | E | 1 | 10 | 1,2,3,4 | 1 | 1,3,4 | 1,2,4 | |
| Q2 | A | 1 | 10 | 1,2,3,4 | 1 | 1,3,4 | 1,2,4 | |
| Q3 | A | 2 | 10 | 1,2,3,4 | 2 | 1,3,4 | 1,2,4 | |
| Q4 | T | 2 | 10 | 1,2,3,4 | 2 | 1,3,4 | 1,2,4 | |
| Q5 | A | 2 | 10 | 1,2,3,4 | 2 | 1,3,4 | 1,2,4 | |