

University of Information Technology & Sciences (UITS)

Faculty of Science and Engineering

Department of CSE

Program: B.Sc. in CSE

Term Final Examination, Spring 2025

Course Title: Structured Programming Language

Course Code: CSE 0613111/CSE 111/CSE 103

Marks: 50

Time: 3(three)hours

(Answer all questions)

- | Q. No. | | Marks |
|--------|---|-------|
| 1. | a) Loops are essential tools in programming. Discuss how you understand the role of loops and why they are useful. Share your thoughts with real-life examples | 5 |
| | b) Write a c program to print out the following number pattern using loop | 5 |
| | 1 1
2 2 1
3 3 2 1
4 4 3 2 1
5 5 4 3 2 1 | |
| 2. | a) Complete the output of the given code. Show the execution steps that demonstrate how the values are changed in each line | 5 |
| | <pre>#include <stdio.h> int main() { int arr[5]; arr[0] = 5; arr[2] = -10; arr[3 / 2] = 2; arr[3] = arr[0]; printf("%d %d %d %d", arr[0], arr[1], arr[2], arr[3]); return 0; }</pre> | |
| | b) Construct a code to insert 10 values into an array and find the average from the given value. | 5 |
| 3. | a) Is it possible to return multiple values from a function in C? if yes, write down the possible ways to return multiple values. | 4 |

- b) Convert the given code by using 3 user-defined functions (Armstrong_Num, Prime_Num, and Perfect_Num) and show the output according to the user input (153). 6

```
#include <stdio.h>
int main()
{
    int num, originalNum, remainder, result = 0, flag, i, sum=0;
    printf("Enter a number: ");
    scanf("%d", &num);

    originalNum = num;
    while (originalNum != 0)
    {
        remainder = originalNum % 10;
        result += remainder * remainder * remainder;
        originalNum /= 10;
    }
    if (result == num)
        printf("%d is an Armstrong number.", num);
    else
        printf("%d is not an Armstrong number.", num);

    if (num == 0 || num == 1)
        flag = 1;

    for (i = 2; i <= num / 2; ++i)
    {
        if (num % i == 0)
        {
            flag = 1;
            break;
        }
    }
    if (flag == 0)
        printf("%d is a prime number.", num);
    else
        printf("%d is not a prime number.", num);

    for(i = 1; i <= num / 2; i++)
    {
        if(num%i == 0)
        {
            sum += i;
        }
    }
    if(sum == num && num > 0)
```

```

    {
        printf("%d is PERFECT NUMBER", num);
    }
    else
    {
        printf("%d is NOT PERFECT NUMBER", num);
    }
}

return 0;
}

```

- 4 a) Explain the recursive function and recursion. Write a code to find the factorial of a given number using recursion. 5

- b) Write down the output of the given code 5

```

int main() {
    char str1[50] = "Hello ";
    char str2[] = "World";
    char str3[] = " ";
    strcpy(str3, str2);
    strcat(str1, str2);
    printf("%s\n", str1);
    printf("%d\n", strcmp(str1, str2));
    printf("%d\n", strlen(str1));
    puts(strrev(str2));
    return 0;
}

```

- 5 a) Define a structure for a student that contains name, ID, and CGPA. Then, write a program to take input from 3 students and display the student information with the highest CGPA. 6

- b) Write the output of the given code and show the changes/ execution in every step. 4

```

#include<stdio.h>
int main() {
    int x[10] = {1,2,3,4,5};
    int *ptr;
    ptr = &x[2];

    printf(" *ptr = %d \n", *ptr);
    printf(" *(ptr + 1) = %d \n", *(ptr+1));
    printf(" *(ptr -1) = %d \n", *(ptr-1));

    return 0;
}

```