



**UNITED  
INTERNATIONAL  
UNIVERSITY**

## Department of Computer Science and Engineering

Exam: **Final**    Year: **2021**    Trimester: **Spring**    Course: **CSE 1111/CSI 121**  
Title: **Structured Programming Language**    Marks: **40**    Time: **1 hr 30 min + 15 min**

**[Any examinee found adopting unfair means will be expelled from the trimester / program as per UIU disciplinary rules.]**

Answer all of the Questions given in the **Section-A** and **Section-B**. At first complete all the Questions in **Section-A** and then **Section-B**. Numerical figures in the right margin indicate full marks.

### Section-A

**Show** the **manual tracing** for each of the programs (assume they are syntactically correct) given below. In the programs, `LAST_FOUR_DIGITS_OF_YOUR_STUDENT_ID` is used. For example, your STUDENT ID is 011202017 and therefore, the value of `LAST_FOUR_DIGITS_OF_YOUR_STUDENT_ID` is 2017. Below, **Use your own student ID**.

1. In the **manual tracing**, **show** the value of variables **num1** and **num2** every time their values change starting from initial value. **[4]**

```
int num1=-1, num2=-1;
int f1(float x);
void f2(int x, float y);
int main(){
    num1 = LAST_FOUR_DIGITS_OF_YOUR_STUDENT_ID % 7;
    num2 = f1(num1);
    f2(12, 15.0);
    return 0;
}
int f1(float x) {
    num2 = x*num1;
    return num2-1;
}
void f2(int num1, float num2){
    num1 = num1+num2;
    num2 = num1-num2;
}
```

2. In the **manual tracing**, show the value of variable **str1** every time its value changes. [4]

```
#include<string.h>
void main(){
    int a = LAST_FOUR_DIGITS_OF_YOUR_STUDENT_ID % 8;
    char str1[50] = "PUT_YOUR_STUDENT_ID";
    char arr[8][20] = {"is truthful",
                    "is honest",
                    "is friendly",
                    "is brave",
                    "is trustworthy",
                    "is straightforward",
                    "is simple",
                    "is dependable"};

    strcat(str1, "-");
    strcat(str1, arr[a]);
    strcpy(str1, strstr(str1, "s "));
}
```

3. **Manual trace** the values of **num** array elements. **Also, write** the final content of the input.txt file. [4]

```
#include<stdio.h>
void main(){
    int sum=0, a = LAST_FOUR_DIGITS_OF_YOUR_STUDENT_ID%7, num[4];
    FILE *fp= fopen("input.txt", "w");
    fprintf(fp, "%s\n", "Good Morning");
    for(int i=0;i<4;i++){
        num[i] = 2*i + a;
        fprintf(fp, "%d\n", num[i]);
    }
    for(int i=0; i<4; i++){
        sum += num[i];
    }
    fprintf(fp, "%d", sum);
    fclose(fp);
}
```

4. What is the **output** of the following program? [4]

```
#include<stdio.h>
void main(){
    int a=LAST_FOUR_DIGITS_OF_YOUR_STUDENT_ID%7;
    int num[10], sum=0;
    for(int i=0; i<10; i++){
        num[i] = 3*i + a;
    }
    for(int i=0; i<10; i++){
        if(i%3 == 0){
            printf("%d\n",*(num+i));
        }
        sum += *(num+i);
    }
    sum /= 10;
    printf("%d\n", sum);
}
```

}

## Section-B

5. Write a program that performs the following operations: [8]
- a) Implement a “**sumOfSevens**” function. The “**sumOfSevens**” function takes an int array and its size as parameters. It finds and returns the sum of all the array elements that are divisible by 7.
  - b) In main() function,
    - i) Declare an array “**scores**” of int type and size 5. At the same time, initialize the array with values **LAST\_FOUR\_DIGITS\_OF\_YOUR\_STUDENT\_ID%9 + 2i**, where i is the index of array.
    - ii) Then, call the “**sumOfSevens**” function passing the array and its size as arguments.
    - iii) Finally, display the returned value from the “**sumOfSevens**” function.

6. Write a program that takes a sentence from keyboard, makes the sentence camel/title casing (first letter of all words capital), appends **your student id** at the end of the sentence as the last word, and finally display the sentence. [8]

For **example**, if your id is “011202017”

Input = “It is a nice sunny morning today”

Output: “It Is A Nice Sunny Morning Today 011202017”

7. Write a program that performs the following operations: [8]
- a) **Define** a structure “**Soldier**” with id (string), age (int), and weight (float) as members.
  - b) In the main() function,
    - i) **Declare** a variable **soldier1** of *Soldier* structure.
    - ii) Take input from keyboard and assigns to the soldier1 member variables.
    - iii) Display the information of soldier1 in the following format:

Id: 011202017

Age: 19

Weight: 61