



**UNITED
INTERNATIONAL
UNIVERSITY**

Department of Computer Science and Engineering

Exam: **Mid Term** Year: **2021** Trimester: **Summer** Course: **CSE 1111/CSI 121**
Title: **Structured Programming Language** Marks: **20** Time: **1 hr + 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** (or some other variations) are used. For example, your **STUDENT ID** is 011202017 and therefore, the value of **LAST_THREE_DIGITS_OF_YOUR_STUDENT_ID** is 017, and you will use 17. Below, **Use your own student ID**.

1. **Find** the values of the following variables **a, b, c, d**, and **e**. **[2.5]**

```
int a = LAST_FOUR_DIGITS_OF_YOUR_STUDENT_ID / 7;  
int b = LAST_FOUR_DIGITS_OF_YOUR_STUDENT_ID % 7;  
float c = (float)LAST_FOUR_DIGITS_OF_YOUR_STUDENT_ID / 7;  
float d = (float)(LAST_FOUR_DIGITS_OF_YOUR_STUDENT_ID / 7);  
int e = (a-b)<0 && c;
```

2. **Manual trace** the values of **i**, and **value_final** every time their value change. **[2.5]**

```
int n = LAST_THREE_DIGITS_OF_YOUR_STUDENT_ID % 66;  
int i = 0, value_final = 0;  
for( i=n-4; i <= n; i++){  
    value_final += i*i;  
    ++i;  
}
```

3. In the **manual tracing**, show the value of variable *i* every time its value changes. [2.5]

```
int a = LAST_FOUR_DIGITS_OF_YOUR_STUDENT_ID % 3 + 1;
int b = LAST_FOUR_DIGITS_OF_YOUR_STUDENT_ID % 2 + 1;
int c = LAST_FOUR_DIGITS_OF_YOUR_STUDENT_ID % 3 + 2;
for(int i=0; i<8; i++){
    switch(i){
        case 0:
            i += a;    break;
        case 1:
            i += b;    break;
        case 2:
            i += a;    break;
        case 3:
            i += c;    break;
        case 4:
            i += b;    break;
        case 5:
            i += c;    break;
        default:
            i+=4;      break;
    }
}
```

4. Show the **manual tracing** for the array **A** elements. [2.5]

```
int A[4]={0};
int i, n;
n = LAST_FOUR_DIGITS_OF_YOUR_STUDENT_ID;
for(int i=0; i<4; i++){
    A[i] = n+i;
    if(A[i]%2 != 0){
        A[i] *= 2;
    }
}
```

Section-B

5. Write a program to perform the following operations: [2.5]

- a) Assign `LAST_FOUR_DIGITS_OF_YOUR_STUDENT_ID + 3` to integer variable **a**.
- b) Add 11 to **a** and assign that to integer variable **b**.
- c) Divide **b** by 15 and assign that back to **b**.
- d) Add **a** and **b** and assign the sum to a new float variable **c**.
- e) Increment the value of **c** by 1.
- f) Print the values of **a**, **b** and **c**.

6. Write a program to perform the following operations. Write the “**then**” conditions using **nested conditional statements**. [2.5]

- a) Assign `(LAST_THREE_DIGITS_OF_YOUR_STUDENT_ID % 17) + 3` to integer variable **a**.
- b) Assign `(LAST_TWO_DIGITS_OF_YOUR_STUDENT_ID % 21) + 5` to integer variable **b**.
- c) Take an integer variable **c** from user.
- d) If **c** is larger than **a** and **b**, **then** check if **c** is even or odd. If even, then print: “c is the largest and even”. Otherwise print: “c is largest and odd”.
- e) If **c** is larger than **a** only, **then** check if divisible by 3 or not. If divisible, then print: “c crossed a and divisible by 3”. Otherwise print: “c is not divisible by 3”.
- f) If **c** is larger than **b** only, **then** check if divisible by 5 or not. If divisible, then print: “c crossed b and divisible by 5”. Otherwise print: “c is not divisible by 5”.

7. Write a program to compute the summation of the following series. [2.5]

$$(-j) + (i) + (2i+j) + (3i+2j) + \dots + (ni+(n-1)j)$$

If the sum is an even number, display your student id; otherwise display your name.

8. Write a program to perform the following operations. [2.5]

- a) Assign `(LAST_TWO_DIGITS_OF_YOUR_STUDENT_ID % 21) + 5` to integer variable **b**.
- b) Declare a one-dimensional integer array **A** of size 10.
- c) Initialize the array values with `a%7 + 3i`, Where **a** = `LAST_FOUR_DIGITS_OF_YOUR_STUDENT_ID` and **i** = array index.
- d) Find the sum of the numbers that are stored in even numbered indices in the array.