United International University (UIU)

Dept. of Computer Science & Engineering (CSE)

Mid Term Exam:: Trimester: Summer 2022

Course Code: CSE 1111, Course Title: Structured Programming Language

Total Marks: **30** Duration: **1:45 hour**

There are FIVE questions. Answer all the questions. Marks are indicated in the right margin.

Q.1 a) **Rewrite** the following code after **correcting the errors**. **[2]**

```
include <stdio.h>
void main() {
    int num1 = 5, float num2, char chr = 'q';
    scanf(“%d”, num2);
    num1 = num2 % chr;
    printf("Result is = %f ", num1);
}
```

b) **Identify** the **invalid variable names** from the following. **Mention the reasons** that make them invalid. **[2]**

```
largest_val, smallest-val, while, 2ndNum, !New, avg marks, val9
```

c) **Compute** the values of the variables **a**, **b**, **c**, and **d**. **[2]**

```
float a=5*(5/2), int b=5*(5/2), float c=5*(5.0/2), int d=5*(5.0/2)
```

Q.2 a) Write down the **output** of the following C program, for **num = 1** and **num = 3**. **[3]**

```
#include <stdio.h>
int main() {
    int num;
    int sum = 0, i = 10, j = 5;
    scanf("%d", &num);
    switch(num) {
       case 1:
          sum = 2*i++;
          j++;
       case 2:
          sum = 2*j--;
          i++;
          break;
       case 3:
          sum = ++i*j--;
       case 4:
          sum = i++*j--;
       default:
          sum=0;
          i=0;
          j=0;
    }
    printf("%d %d %d", i, j, sum);
    return 0;
}
```

b) **Manually trace** the following code segment and show the **change of values of the variables *i, sum, b, a, y, x*** in each step. **[3]**

```
int sum=0, i, a = 1, b, x = 1, y = 1;

for(i=1; i<=5; i++) {
     sum = sum + a;
     b = 6*x + 1;
     a = a + b;
     y++;
     x = x + y;
}
```

Q.3 a) **Replace** the nested **"for"** loop in the following code using nested **"do-while"** loop **without changing the logical meaning** of the program: **[3]**

```
void main() {
      int n = 3, i, j, sum = 0;
      for(i = 0; i < n; i++) {
           for(j = 0; j <= i; j++) {
                if(i == j) sum += i + j;
                  else if(i > j) sum += i + n;
                else sum += n - j;
           }
      }
}
```

b) **Write a program** to find the **online average** of the **positive numbers** given as inputs by the user. To solve this problem, you should do the following: **[3]**

i. Write an **infinite loop** that will terminate if the user gives 0 as input.
ii. If the user gives a **positive number** as input, you should keep adding it.
iii. You should also **keep track** of how many positive numbers are given as inputs.
iv. Finally, when the loop terminates, you should **calculate the average** by dividing the sum of the positive numbers by the total positive numbers.

Q.4 a) Show the **manual tracing** (show the values of all the variables and array elements in each step) for the following code segment. **[3]**

```
int F[6] = {0};
int i, n;
n = 3;
for(i = 0; i<6 ; i++){
     F[i] = n+i;
     if(F[i]%2 == 0){
           F[i] *= 2;
     }
}
```

b) **Write a program** to perform the following operation: **[3]**

i. Read **n integer numbers** from keyboard and **store** them in an array of size 100, where n is input integer from keyboard.
ii. **Print** all the array elements with their indices (plural of index) in the following format.

Index	Value
0	11
1	7
..	..

iii. **Find and print** the **average** of the numbers that are stored in **odd numbered indices** in the array.

Q.5 a) **Draw a flowchart** to find the **sum** of the following series up to n terms, where n is input integer number from keyboard. **[3]**

$$1 - 2 + 3 - 4 + \cdots upto\ n\ terms$$

b) **Write a program** that takes an integer ***n*** as input from the user and **prints** the following **pattern**. Program for n, NOT 3 or 5. **[3]**

Sample input, n	Sample output
3	6 4 2 4 2 2
5	10 8 6 4 2 8 6 4 2 6 4 2 4 2 2