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]**

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

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