United International University (UIU)

Dept. of Computer Science & Engineering (CSE)

Mid Term Exam:: Trimester: Fall 2022

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

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

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]**

```
#includes <studio.h>
int Main() {
      int a, b, float sum;
      Scanf("%i", &a);
      a , b=10;
      a+b =sum;
      Printf("%d", &sum);
}
```

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

```
sum_of_digit , switch , calculate sum , ( )value , const, Sum,
calculate-sum , 1st_sum
```

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

```
int a = 17%7*5;
float b = (int)(17.0/5);
float c= (int)17/5.0;
int d = (a>b) && c;
```

Q.2 a) **Manually trace** the following C code segment for **num=3** and show the **change of values of all the variables** in each step. **[3]**

```
#include <stdio.h>
int main() {
    int num;
    int sum = 10, i =7, j = 2;
    scanf("%d", &num);
    switch(num) {
      case 1:
      case 2:
            sum += --j*2;
            i--;
      case 3:
            sum = ++i*j--;
            break;
      case 4:
            sum *= i++/j--;
            i=i%j;
      default: break;
    }
    printf("%d %d %d",sum,i,j);
    return 0;
}
```

b) **Re-write** the given C code segment in Q.2(a) using the **"if-else"** statement without changing the logical meaning and output. **[3]**

Q.3 a) Write a complete program to print the following series up to '**Nth**' term and also find the **sum of the series**. **[3]**

Sample Input	**N = 3**
Sample Output	**0, 5, 18, 39, 68, 105** **Sum - 235**

Q.3 b) **Manually trace** the following code for '**rows = 3**'. **Show** changes of **all the variables** in each step. **[3]**

```
int i, space, rows, k = 0, count = 0, count1 = 0;
for (i = 1; i <= rows; ++i) {
   for (space = 1; space <= rows - i; ++space) {
      printf("  ");
      ++count;
   }
   while (k != 2 * i - 1) {
      if (count <= rows - 1) {
         printf("%d ", i + k);
         ++count;
      } else {
         ++count1;
         printf("%d ", (i + k - 2 * count1));
      }
      ++k;
   }
   count1 = count = k = 0;
   printf("\n");
}
```

Q.4 a) **Manually trace** the given code segment for the following array assuming **size=5**. **Show** the changes of **all the variables** in each step. **[3]**

A	10	20	10	10	100

```
for(i=0; i<size; i++){
    for(j=i+1; j<size; j++){
        if(arr[i] == arr[j]){
            for(k=j; k<size-1; ++k){
                arr[k] = arr[k+1];
            }
            size--;
            j--;
        }
    }
}
```

b) Write a program that **reads a number n**. Now, take **n inputs** in an array named **marks[10]**, here n is **less than 10**. Now, find the maximum number and its position within the even values of the array. **[3]**

Sample Input:
6
1 **10** **6** 51 **24** 13

Sample Output:
Even value max = 24, found in index 4

Q.5 a) **Draw a flowchart** for the C program given as follows: **[3]**

```
#include <stdio.h>
int main(void) {
   int row = 10;
   while (row >= 1) {
      int column = 1;
      while (column <= 10) {
         printf("%s", (row % 2) ? "<": ">");
         ++column;
      }
      --row;
      puts("");
   }
}
```

b) Write a C program to display following '**Y**' pattern. **[3]**

Sample Input	**Sample Output**

		3	* * * *	
		5	* * * * * * *	