United International University (UIU)

Dept. of Computer Science & Engineering (CSE)

Mid-term Exam: : Trimester: Spring 2024

Course Code: CSE 1111, Course Title: STRUCTURED PROGRAMMING LANGUAGE

Time: 1 hour 30 min Total Marks: 30

Answer all the questions.

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

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1. (a) **Identify** and **correct** errors in the following code segment (below left). [3]

(b) **Find output** of the following code segment (below right). [3]

```
include <stdio>
Int main {
   int Num, a;
   Num = 20%3;
   a = Num+10
   printf("%d %f ", Num, a,);
   return 0;
}
```

C Code for **1(a)**

```
  int a=3, b=4, c=-5, result;
  int mod;
  result = a * b % c + b;
  printf("result = %d\n",result);
  if (result >= 0 && result < 10) {
       printf("a =  %d\n", a);
  }
  else if (result >= 5) {
       printf("b =  %d\n", b);
  }
  else printf("a = %d\n", a);
```

C Code for **1(b)**

2. (a) **Rewrite** the code segment (below left) using "**if … else**" without changing the logical meaning. [3]

(b) **Manually trace** the following code segment (below right) and show **all the changes** of the variables **i,p,** and **x** in **each step**. [3]

```
int num=5, sum=10, i=4, j=9;
switch(num) {
   case 1: sum *= 3;
   case 2:
   case 3: sum += --j * 2;
           i--; break;
   case 4: sum = ++i * j--;
           break;
   case 5: break;
          i += 10;
   default: sum *= i++ / j--;
           i=i % j; break;
}
```

C Code for **2(a)**

```
#include <stdio.h>
int main() {
  int p=1;
  int x = 490;
  for(int i=1;i<=p;){
    printf("%d %d %d\n",i,p,x);
    if(x % 29 == 0){
       printf("Not a great number!");
       break;
    }
    else {
       x -= 13;
       p += x % 10;
       i += 3;
    }
  }
  return 0;
}
```

C Code for **2(b)**

(c) Draw a **flow chart** for the given code segment in **Q.2(b)** (above right). [3]

3. (a) Write a **C program** to print the following pattern of **digit '2'**. Take **n** as user input where n is **odd** and **n>=5**. [3]

Sample input	**n=5**
Sample output	* * * * * * * * * * * * * * * * *

(b) Replace the "**outer**" **while** loop with "**for**" and the "**nested**" **for** loop with "**while**" loop in the following code without changing the logical meaning of the program. [3]

```
int i=0, count = 0;
int n = 12345;
while (n != 0) {
   printf ("%d", n % 10);
   count++;
   for(; i<count; i++) {
        printf("%d", n/= 10);
   }
   printf ("\n");
}
```

4. **Manually trace** the given code segment below. Show the changes of all the variables ***i***, ***hi, hlw*** and array ***arr*** elements in each step. [3]

```
int hi = 0, hlw = 10;
int arr[4] = {10, 20, 30, 40};
for(int i=4; i<=hlw; i++) {
    arr[hi] = arr[hi+1] - 5;
    hlw -= 2;

}
```

5. Take an array as **input** of size N. Then take **another number** as **input in K**. Your task is to **add** this **number** to the **even indexed elements**, and **subtract** from the **odd indexed elements**. [6]

Sample Input	**Sample Output**
N=5 Array Elements: 10 20 30 40 50 K=4	14 16 34 36 54

OR

Write a program which will take input of **N x N numbers** in a **2D** array A. Now **swap all the elements** in the **first** and **last column** within the array and finally **print** the array. [6]

Sample Input	**Sample Output**
3 1 4 7 2 8 3 5 6 0	7 4 1 3 8 2 0 6 5