# United International University (UIU)

## Dept. of Computer Science & Engineering (CSE)

**Mid-term Exam: : Trimester: Fall 2023**

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

Time: 1 hour 45 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) Which of the following variable names are **invalid** and **why**? [1]

```
(i) int_a (ii) _num (iii) 99p (iv) "my_val"
```

(b) **Compute** the values of the variables **a, b, c,** and **d**. ASCII codes: A-65, a-97, 0-48. [2]

```
(i) float a = 101/7;
(ii) float b = (float)(3%5);
(iii) float c = 21>43 || 6!=6;
(iv) double result = 12 + (1 * '3');
```

(c) **Find outputs** of the following code segment for (i) **num = 2.3,** and (ii) **num =127.** [3]

```
int num;
scanf("%d", &num);
if (num % 2 != 0)  {
  printf("Mashrafe\n");
}
if (num < 100)  {
  printf("Shakib\n");
}else if (num >= 100){
  printf("Mahmudullah\n");
}
if (num >= 0 && num < 5){
  printf("Imrul\n");
}else if (num >= 0 && num
<= 49){
  printf("Tamim\n");
}else{
  printf("Rubel");
}
```

C Code for **1(c)**

```
int a,b,c;
scanf("%d%d%d",&a,&b,&c);
int result=a--/b++;
switch(a+b){
   case 1:
      result+=a/c*2;
      b++;
   case 2:
   case 3:
      result=a*c/b;
      a++;
   case 4: break;
           a=2;
   default: result=5;
}
printf("%d %d %d %d",
            a,b,c,result);
```

C Code for **2(a)**

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

(b) **Manually trace** the following code segment and show **all** the change of values of the variables ***start, end, i, count*** in each step. [3]

```
int start=105,end=112,count=0;
for(int i=end;  i>=start;  i--){
    if(end%2 != 0){
        count++;
        start++; end+2;
    }else{
        end--; start+1;
    }
}
```

3. (a) Write a C program to display the following 'M' pattern for n. For example, for n = 3, and n=5 the output pattern will be as follows. You must program for n, not for 3 or 5. [3]

| **Sample input** | **n=3** | **n=5** |
|---|---|---|
| **Sample output** | * * *<br>* * *<br>* * | * * * * *<br>* * * * *<br>* * * * *<br>* * * * *<br>* * * * |

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

```
int a=10, b=20, count=0;
for(int i=b;i>=a;i--){
     for(int j=a;j<=b;j++){
         printf("%d ",j);
     }
     if(b%2!=0){
         printf("%d \n",a);
     }else{
          printf("%d \n",b);
     }
}
```

C Code for **3(b)**

```
int n;
printf("Enter a +ve integer:");
scanf("%d", &n);
if (n <= 0) {
    printf("Enter a +ve integer.");
}else {
     int fact = 1, i = 1;
     do {
          fact *= i;
          i++;
     } while (i <= n);
     printf("Factorial of %d is %d",
                              n, fact);
}
```

C Code for **4(a)**

4. (a) Draw a flow chart of the given code segment (see above right). [3]
(b) Write a C program to **take** input of all the bank account balance of ***n*** clients of a bank. **Remove** any balance less than 500.00 taka. **Now, display** all the balances. [3]

5. (a) **Manually trace** the given code segment (see below left). Show the changes of all the variables ***i***, and array ***ara*** elements in each step. [3]

```
int ara[5] = { 8,6,2,4,7 };
for(int i = 1; i < 5; i += 2){
   ara[i] =  3 * ara[i - 1];
}
for(int i = 1; i < 5; i++){
   if(i % 2 == 0){
      ara[i] = i * 4 + ara[i-1];
   }
}
```

C Code for **5(a)**

```
int row, col, sum = 0;
int A[][3]={{1,2,3}, {11,5,6},
           {12,7,9},{8,13,4}};
for(row=0; row<4; row++){
   for(col=0; col<3; col++){
      if(col>row)  {
          sum += A[row][col];
      }
   }
}
```

C Code for **5(b)**

(b) **Manually trace** the given code segment (see above right) and show the changes of all the variables ***row***, ***col***, and ***sum*** in each step. [3]