United International University (UIU)

Dept. of Computer Science & Engineering (CSE)

Mid Term Exam:: Trimester: Spring 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

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

```
#include<studio.h>
#include<math.H>
int Main (){
   Float n_, m = 5;
   scanf("%d", n_)
   float p = (n_%m)/sqrt(6;
   printf("%d", P);
}
```

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

_Num1, 1time, $VALUE, “myValue”, num6, first_name, last-name, f1x

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

```
int a = 10.0/3*10;
float b = (int)23.0%11;
int c = (10 > 9 && 21 <= 19)*5;
float d = 7/2;
```

2 a) Find the outputs when the input values of variable b are 4, 5 , 10 and 12, respectively. [2]

```
int b;
scanf(“%d”, &b);
printf(“Begin\n”);
if (b>=5)
    printf(“UIU\n”);
else if(b<=5)
    printf(“CSE\n”);
else if ((b>=2)||(b<10))
    printf(“COMPUTER\n”);
else if ((b>2)&&(b<=10))
    printf(“NICE\n”);
else
    printf(“Bye\n”);
printf(“End”);
```

b) In a factory there are three categories of employees: X, Y, Z. The manager announced a bonus for the employees who have [4]

- 12 years or more work experience and more than 5 family members,
  OR
- Less than 1000.50 BDT total family income per month

He is also generous to his bonus deprived employees who have a larger family. Thus, He has declared the bonus for

- For the employees of ‘Y’ and ‘Z’ categories who have more than 8 family members and has less than 1100.78 BDT total family income per month.
- However, if an employee is from ‘X’ category, he can avail the bonus having more than 6 family members.

Now you need to automate the system by writing a program to take following inputs from user (employee) and notify him whether he is eligible for the bonus or not.

- Category (character)
- Years of work experience (integer)
- Number of family members (integer)
- Total family income per month (float)

3 a) Manually trace (show the values of all the variables in each step) the following code segment. [3]

```
int n = 5, sum = 0, i, a = 3, sign = 1;
for(i = 1; i<=n; i++)
{
   sum = sum + a*sign;
   if(i%2==0)
      a = a + 6;
   else
      a = a + 4;
   sign = -sign;
}
printf("\n%d", sum);
```

b) Write a program to determine whether a number is a ***deficient number*** or not. A number is deficient if the summation of its factors is less than double of the number. For example, 15 is a deficient number as the sum of its factors (1+3+5+15=24) is less than 30 (double of 15). On the other hand, 24 is not a deficient number. Because the sum of the factors of 24 (1, 2, 3, 4, 6, 8, 12, 24) is 60 which is larger than double of 24. [3]

4 a) Show the manual tracing (show the values of all the variables and array elements in each step) for the following code segment [2]

```
int F[6]={0};
int i;
F[0]=1;
F[1]=1;
for(i=2; i<=5; i++){
   F[i]=F[i-1]+F[i-2];
   printf("%d   %d    %d\n", F[i-2], F[i-1], F[i]);
}
printf("%d   %d    %d", F[i-2], F[i-1], F[i-1]+F[i-2]);
```

b) Write a Program that will take n integer numbers into an array, and then find the maximum - minimum among them with the index positions. [4]

Sample input	**Sample output**
5 1 2 3 4 5	Max: 5, Index: 4 Min: 1, Index: 0
6 2 8 3 9 0 1	Max: 9, Index: 3 Min: 0, Index: 4

5 a) Draw a flowchart that always displays the following menu. It also takes a choice from the user and handle according to the menu. [2]

Enter 1, to display "SPL is fun!"
Enter 2, to display "(On campus) University life is the Best!"
Enter q, to quit.

b) Write a C program that takes an integer value ***n***, and draw the pattern below. [4]

Sample input, n	Sample output
3	x x x x x
5	x x x x x x x x x