

United International University (UIU)

Dept. of Computer Science & Engineering (CSE)

Final Exam:: Trimester: Fall 2022

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

Total Marks: **40** Duration: **2 hours**

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

There are FIVE questions. Answer all the questions. Marks are indicated in the right margin.

Q.1 a) Write output of the following code, if user inputs are 21, 24, 27, 30, 33, 36, 39, 42... sequentially. [4]

```
#include <stdio.h>
#define SIZE 4
void main(){
    int i, j, mat[SIZE][SIZE]={0};
    for(i=0; i<SIZE; i++){</pre>
         for(j=i+1; j<SIZE; j++)</pre>
             scanf("%d", &mat[i][j]);}
    for(i=0; i<SIZE-1; i++){</pre>
         for(j=i+1; j<SIZE; j++)</pre>
             scanf("%d", &mat[j][i]);}
    for(i=0;i<SIZE;i++){</pre>
         for(j=0;j<i;j++)
             mat[i][j]+=mat[j][i];}
    for(i=0;i<SIZE;i++){</pre>
         for(j=0;j<SIZE;j++){
             printf("%d\t",mat[i][j]);}
         printf("\n");}
```

b) Write a program that declares a 4x4 matrix and initializes it with the values given below. The [4] program then calculates the **sum of all elements** that lies within the "N" **shape** as shown in the following figure.

1 2 3 4 5 6 0 6 0 2 1 3 1 4 6 2

Q.2 a) Find out the **output** of the following program.

#include<stdio.h> int a=0,b=0,c=0; int func1(int p) { c=p+a;return c; int func3(int c){ c = 2;a *=2;return c*a; void func2(int x, int b){ x *= 2; b = func3(x);void main(){ a = 2121 % 47;func3(a); printf("%d %d %d \n",a,b,c); b = funcl(a);printf("%d %d %d \n",a,b,c); func2(a,b); printf("%d %d %d \n",a,b,c); }

[4]

- Q.2 b) There is a magical world of Narnia, where time is different from the time in this world and where [animals can speak. The path to Narnia is through a cupboard. A very special cupboard which can also store items.
 - (i) Suppose there are some drawers in the cupboard. Each drawer has different number of items stored. In main() function, declare two arrays, items[] and add[] of size 1000. Take an integer n and n integers to populate both the arrays from user.
 - (ii) Write a function additems(int items[], int add[], int n) which will take the declared arrays and n as the parameters and then increase every ith element of the array items by the corresponding ith element of the latter array. (Hint. If items[1]=10, add[1]=4 updated items[1]=14)
 - (iii) Now to open the door of the cupboard, a special password should be uttered. Write another function openDoor(char password[]) which match the parameter password with the predefined password, "Narnia". If it matches, it will print a line- "Door to Narnia is open.". Otherwise, it will print- "There is no door".
 - (iv) In the main function, (a) after declaration and population of the arrays (as mentioned in (i)),(b) call the function additems passing arguments. (c) Then take a string as a user input and call the openDoor function passing that string as argument.

[4]

[4]

[8]

Q.3 a) Manually trace the following code and show the values of str1 and str2 in each step. Assume "Hello World", and "Programming is fun" as input from keyboard for str1 and str2 respectively.

Write a program to find whether a substring is present in the main string. You **cannot** use any built in functions of **string.h** header file.

Sample Input	Sample Output	
Main string: Today is a good day!!!	Substring matches	
Substring: good		
Main string: Today is a good day!!!	Substring does not match	
Substring: hello		

- Q.4 Write a program that will store the following information of a student in a structure.
 - a) Name, b) ID, and c) Marks of 5 (five) CT's,

Use **appropriate data types and variable names** for all the features. The program will also have the following functionalities:

- i. Take input for **50 students** from the users.
- ii. For each student, calculate the **total marks** of all the CT's.
- iii. Find and print the name of the highest marks scorer for each CT's separately.
- **Q.5** a) Show the **output** of the following program:

void f1(int *arr, int n){
 for (int i = 0; i < n; i++){
 if (*(arr + i) % 2!= 0){
 printf ("%d\n", *(arr + i) + (i*2));
 }
 }
}
void main(){
 int arr[] = {2, 3, 6, 7, 11, 8};
 f1(arr, 6);
}</pre>

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- (i) Reads the following "Sample.txt" file that has integer numbers on separate lines and store them in an integer array.
- (ii) Create a new file "Ouput.txt" and save the even numbers from the integer array on separate lines in that file.

Name of the File	Sample.txt	Output.txt
Content of the File	1	2
	2	4
	3	6
	4	8
	5	
	6	
	7	
	8	