931, 932

C125

Air University

(Mid-Term Examination: Fall 2024)

241503

Subject: **Programming Fundamentals**
Course Code: **CS-111**
Class: **BS-CYS**
Semester: **I**
Section: **A/B**

Total Marks: **60**
Date:
Time:
Duration: **2 Hours**
FM Name: **Khwaja Mansoor**

HoD Signatures:

FM Signatures:

Note:

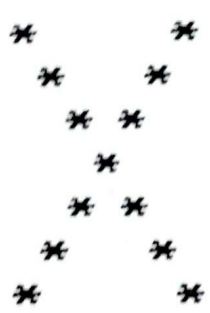
- **All questions must be attempted.**
- **This examination carries 25% weight towards the final grade.**

	Q. No. 1 (CLO 1)	20 Marks
	Differentiate the following pairs of concepts	
a	Counter-Controlled while Loops vs Sentinel-Controlled while Loops	5
b	Multiprogramming vs Timesharing Processing	5
c	Signed, vs Unsigned Data Types Modifiers	5
d	Sequence & Selection control	5
	Q. No. 2 (CLO 2)	**20 Marks**
a	**Perform a dry run of the above C++ program for the following input values:** a) choice = 3 b) choice = 5 c) choice = 2 d) choice = 6 **Instructions:** •Track the flow of control through if-else, switch, while, and for loops. •Write down the output of each cout statement and explain what happens to the value of variables like choice and sum during execution. •Consider the effects of the switch statement on choice and the nested if-else in the for loop.	20

```
#include <iostream>
using namespace std;

int main() {
    int choice, num, sum = 0;

    // First cout statement
    cout << "Enter a number (1-5): ";
    cin >> choice;

    // if-else statement
    if (choice < 1 || choice > 5) {
        cout << "Invalid number!" << endl;
```

```
    } else {
        // Second cout statement
        cout << "You entered a valid number!" << endl;

        // switch statement with additional cases
        switch(choice) {
            case 1:
                cout << "You chose 1." << endl;
                break;
            case 2:
                cout << "You chose 2. Doubling your choice."
<< endl;
                choice *= 2;
                break;
            case 3:
                cout << "You chose 3. Adding 1 to your
choice." << endl;
                choice += 1;
                break;
            case 4:
                cout << "You chose 4." << endl;
                break;
            case 5:
                cout << "You chose 5. Resetting choice to 1."
<< endl;
                choice = 1;
                break;
        }
        // while loop with additional condition
        int i = 0;
        while (i < choice) {
            sum += i;
            // Third cout statement
            cout << "While loop iteration " << i + 1 << ":
sum = " << sum << endl;
            i++;
        }
        // for loop with nested if-else
        for (int j = 0; j < choice; j++) {
            if (j % 2 == 0) {
                // Fourth cout statement
                cout << "For loop iteration " << j + 1 << ":
even number." << endl;
            }else {
                // Fifth cout statement
                cout << "For loop iteration " << j + 1 << ":
odd number." << endl;
            }
        }
    }
    // Final cout statement
    cout << "Program completed! Final value of sum: " << sum
<< endl;
    return 0;
}
```

	Q. No. 3 (CLO 3)	**20 Marks**

	Write the code for the following programs	
a	Write a C++ program to print one of the following pattern on the screen. N=7 for each case, N is a variable:  OR 	10
b	The Fibonacci numbers are members of an interesting sequence in which each number is equal to the sum of the previous two numbers. In other words, Fi = Fi-1 + Fi-2 Where Fi refers to the ith Fibonacci number. By definition, the first two Fibonacci numbers are 1. i.e, F1 = F2 = 1 Hence F3 = F2 + F1 = 1 + 1 = 2 F4 = F3 + F2 = 2 + 1 = 3 and so on Write a program that determines the first n (user supplied number) Fibonacci numbers.	10

********** End of Question Paper **********