**NATIONAL UNIVERSITY OF MODERN LANGUAGES  
Faculty of Engineering & Computer Science**

**Department of Computer Science**  
**BSCS - Semester 1st (Afternoon)- Section B**

**End Term Examination – June 2023**

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| **Paper: Programming Fundamentals Lab Time Allowed: 3 Hours** | **Total Marks: 25**  **Course Code:** |
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**Instructions:**

* Attempt all questions
* Write down your roll # on the question paper.
* Attach your question paper with the answer sheet before leaving examination hall.
* Keep your roll # slips and university ID cards with you during the examination.
* Solve all questions on answer sheet.
* Before Attempting the paper read carefully and thoroughly.
* Smart watch or any kind of PDA/ mobiles are strictly prohibited

**Q No: 1**. **(5 marks)**

Write a C++ program and declared the 2D character array of size 3x3. Initialize the values from user and then displays a menu system **(using switch)**

Press 1 to find total number of vowels

Press 2 to display details of individual vowels, e.g., total A’s=5, total E’s=?, I,O,U and so on.

In the main call only MENU( ) function.

**int main(){ Menu(); }**

**Q No: 2. (5 marks)**

Write a C++ program that determines which of 3 geographic regions within a country (Islamabad, Lahore, Karachi) had the fewest reported traffic accidents last year.

It should have the following two functions, which are called by main.

* **int getNumAccidents()** is passed the name of a region. It asks the user for the number of traffic accidents reported in that region during the last year, validates the input, then returns it. It should be called once for each city region.
* **void findLowest()** is passed the five accident totals. It determines which is the smallest and prints the name of the region, along with its accident figure.
* In the **main()** use switch to enter values for all the three regions one by one.

**Q No.3: (5 marks)**

Write a program that contains two arrays each of size 10. Initialize both the arrays by taking values from user using function getinput(). Swap their values in such a way that none of the values will lost.

**USE POINTER NOTATION ONLY TO ACCESS ARRAY ELEMENTS.**

**Q NO. 4: (10 marks)**

Write a program that should have two structures named **Student** and **Department**. There are total 3 departments (Software, Computer and Bioinformatics). Each department can hold max 10 numbers of students.

The program should:

1. First ask the user to choose his department name (Software, Computer or Bioinformatics). (2 marks)
2. Add the records of 10 students i.e. student’s *name*, *id* and the *marks* of three subjects for each student. (2 marks)
3. Display all the records of students for each department in the form of table. (1 marks)

The prototype for **Student** and **Department** structure is as follows:

**struct Student {**

**string name,**

**int id,**

**double marks [3]**

**};**

**struct Department {**

**string name;**

**Student stds[10];**

**};**

**Good Luck**