Fast**National University of Computer & Emerging Sciences, Karachi  
  
Programming Fundamental Lab**

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| **Course Code:** | **Course Name: Programming Fundamental Lab** | |
| **Instructor Name** | | |
| **Student Roll No:** | | **Section No:** |

**Time**: 100 Minutes **Max Marks:** 30 points

**INSTRUCTIONS**

**NOTE: Violation of any of the following instructions may lead to the cancellation of your submission.**

* **Understanding question/paper is the part of your evaluation.**
* **Make a new folder named as per your student ID “19-abcd”, Name the question as Q1, Q2, and Q3 and also take the screenshot of output and save inside the folder with the name Q1\_output.**
* **Make sure that the first statement of your program must displays your role no and copy-paste questions and output into the folder and submit the folder at \\netstorage**

**Question # 1:**

A certain grade of steel is graded according to the following conditions:

* Hardness must be greater than 50
* Carbon content must be less than 0.7
* Tensile strength must be greater than 5600

The grades are as follows:

Grade is 10 if all three conditions are met

Grade is 9 if conditions (i) and (ii) are met

Grade is 8 if conditions (ii) and (iii) are met

Grade is 7 if conditions (i) and (iii) are met

Grade is 6 if only one condition is met

Grade is 5 if none of the conditions are met

Write a program, which will require the user to give values of hardness, carbon content and tensile strength of the steel under consideration and output the grade of the steel.

**Question # 2:**

A small airline has just purchased a computer for its new automated reservations system. The president has asked you to program the new system. You’ll write a program to assign seats on each flight of the airlines only plane (capacity: 10 seats). Your program should display the following menu of alternatives:

Please type 1 for "first class" Please type 2 for "economy"

If the person types 1, then your program should assign a seat in the first-class section (seats 1– 5). If the person types 2, then your program should assign a seat in the economy section (seats 6– 10). Your program should then print a boarding pass indicating the person's seat number and whether it’s in the first class or economy section of the plane. Use a single-subscripted array to represent the seating chart of the plane. Initialize all the elements of the array to 0 to indicate that all seats are empty. As each seat is assigned, set the corresponding element of the array to 1 to indicate that the seat is no longer available. Your program should, of course, never assign a seat that has already been assigned. When the first-class section is full, your program should ask the person if it’s acceptable to be placed in the economy section (and vice versa). If yes, then make the appropriate seat assignment. If no, then print the message "Next flight leaves in 3 hours."

**Question # 3:**

You are planning a car trip so you post on a carpooling website in order to share the cost of the trip.

If you have 0 passengers the carpool site does not charge anything and you alone pay the full cost of the trip. If you have 1 or more passengers the carpool site adds a $1 fee to the cost of the trip and evenly divides the total cost ($1 fee + gas) among the passengers and you. You want to write a program that calculates the cost you have to pay. The program should read the number of passengers (an integer) and the cost of gas for the trip (a decimal number). The program should then print the cost that you have to pay (a decimal number) with 2 digits after the decimal point.

**Question # 4:**

Write a C program to generate the following output:

