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| **National University of Computer and Emerging Sciences, Lahore Campus** | | | | |
| C:\Users\saif\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Word\final design.jpg | **Course:** | **Introduction to Computing** | **Course Code:** | **CS-101** |
| **Program:** | **BS (Computer Science)** | **Semester:** | **Fall 2016** |
| **Duration:** | **2.5 Hours** | **Total Marks:** | **50** |
| **Paper Date:** | **6/DEC/16** | **Weight** | **-** |
| **Section:** | **A** | **Page(s):** | **2** |
| **Exam:** | **Final** | **Reg. No.** |  |

**Q. No: 1 (15 Marks)**

You are hired by a security agency for encrypting (encoding) their secret messages so that they cannot be understand by others. They are currently using the classic Ceaser cipher encryption protocol.

The protocol is as follows: Each letter in the original message is decoded to the letter that was X places before it in the English alphabets. The X is an integer given by the user and it should be between 0-26.

For example, if X=10 then you will replace A with Q, B with R etc...



Your C++ program will input X and the message. The message terminates with # tag. The output should be the encrypted message without # tag. Write an efficient code and use minimum number of if statements.

Example:

**Input:**

X= 3

Message = Send 200 people on eastern border#

**Output:**

VHQG 200 SHRSOH RQ HDVWHUQ ERUGHU

**Q. No: 2: (15 Marks)**

Take height of triangle as an input and print the following pattern.

E.g. enter height of triangle: 4

1

2 3

4 5 6

7 8 9 10

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

**A)**. **(5)**

Write a program which takes inputs in matrix and give sum of all diagonal elements.

e.g.

**Result:** 15.

**B). (15)**

Take a 2d array of integers and sort elements in each row in ascending order.

**e.g.**

Input:

Output: