



**COMSATS University Islamabad, Lahore Campus**

**Midterm Examination - FALL 2022**

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| Course Title: | Lab-Microprocessor and Assembly Language | | | | Course Code: | | CSC321 | | Credit Hours: | 3(2,1) |
| Course Instructor/s: | Amaid Zia | | | | Programme Name: | | BSCS | | | |
| Semester: | 4th | Batch: | SP21 | Section: | B | | Date: | \_\_/11/2022 | | |
| **Time Allowed:** | **1 hr and 30 Minutes** | | | | **Maximum Marks:** | | | **25** | | |
| Student’s Name: |  | | | | Reg. No. |  | | | | |
| **Important Instructions / Guidelines:**   * Test with at least **3 different inputs** (where applicable) and attach screenshots of your outputs * Use comments and proper naming schemes in your program. * Marks reserved for working code. * It is your responsibility to protect your code and save it from being copied. **Copied work will get a straight zero**. * No late submissions acceptable | | | | | | | | | | |

### Question 01: [CLO-6] [Marks: 10]

Write an assembly language code that prints out a pattern similar to one shown below for the number of rows, represented by **N** , inputted by the user (N should be **odd**).

For example for N=5 , the pattern should be :

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### Question 2: [CLO-6] [Marks: 10 + 5]

#### Part(a)

For finding the LCM i.e. Least Common Multiple , for two numbers , an algorithm is given below:

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| int lcm(int x , int y )  {  int res = (x > y) ? x : y; // find max of the two numbers  while (1) {  if (res % x == 0 && res % y == 0)  break;  else  ++res;  }  return res;  } |

Write an assembly program that takes 2 numbers , **X** and **Y** , as word variables and then returns their LCM in variable , **RES**

#### Part(b)

Consider a sequence that is defined as follows:

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| --- |
| S[i] = S[i-1] + S[i-2] - S[i-3]  where  S[0] = 0 ,  S[1] = 1 and  S[2] = 2 |

Write a program to calculate the first 10 terms of the sequence above , given that the first 3 terms are already known. Consider each element to be 2 bytes in size.