



Capital University of Science and Technology

Department of Computer Science

CS2523 – Computer Organization and Assembly Language

ASSIGNMENT NO. 4: Registers, Segmented Memory Model, Logical to Physical Address Calculation

CLO: 1. Define concepts in the design of microprocessor as state machine and designing its data path and its controller. [C1- Remembering]

CLO: 3. Implement assembly programs of intermediate complexity using the intel 8088 architecture. The student should also be able to convert intermediate complexity program in high level language into assembly code. [C3- Applying]

Semester: Fall 22

Max Marks: 10

Instructor: Ms. Tayyaba Zaheer

Assigned Date: December 05, 2022

Due Date: December 10, 2022

Name:

Reg. No.

Guidelines:

You are required to submit the **screenshots of code and output of the program (where required) and concepts in your own words i.e. must be hand written** in the assignment file (word or pdf – pictures attached must be readable and in portrait mode) as **courseCode_studentReg#_studentName** via Microsoft Teams.

Important Note:

- 1) Must not copy from other students, so do it all yourself.
- 2) **Assignment** should be **hand written**.

Description:

Emu8086 is an 8086-microprocessor emulator and disassembler. Emu8086 permits to assemble, emulate and debug 8086 programs (16bit/DOS).

Tasks: [Hint: you can take help from lectures]

Task#1: Segmented Memory Model and Registers:

(04 marks)

Question#1: What are the General Purpose Registers in Assembly Language?

Question#2: What are the Special Purpose Registers in Assembly Language?

Question#3: What are the Segment Registers?

Question#4: Why we need Offset Registers?

Task#2: Logical to Physical Address Calculation:

(06 marks)

Question: Calculate the physical memory address generated by the following segment offset pairs (both are hexadecimal values).

a) 0000:0100

16-bit Segment Address: 0000

16-bit Offset Address: 0100

b) DAD1:2345

16-bit Segment Address: DAD1

16-bit Offset Address: 2345

c) FFFF:5432

16-bit Segment Address: FFFF

16-bit Offset Address: 5432