United International University (UIU)

Dept. of Computer Science & Engineering (CSE)

Mid-Term Exam: Trimester: Summer 2022

Course Code: CSE 4325 Course Title: Microprocessor, Microcontroller and Interfacing
Section: (A, B, C) Total Marks: 30 Duration: 1 hour 45 minute(s)

Any examinee found adopting unfair means would be expelled from the trimester/ program as per UIU disciplinary rules.

Question 1: Answer all the questions. (10 Marks)

a. Draw the diagram of a 16-bit microprocessor with a 20 bit address bus and 8 bit data bus interfaced to a 96KB RAM system using the full decoding method. Each RAM chip has a 15 bit address bus and 8 bit data bus. Provide the corresponding address range (starting address, 3rd address and end address) for the system. [5+3]

b. Modify the circuit of (Q1. a) to interface at the memory range of E8000H – FFFFFH. [2]

Question 2: Answer all the questions. (6 Marks)

a. In programmed I/O, if we set the value of the DDRX register of a particular port to 26H, what does it signify? [2]

b. [4]
Suppose, transfer of bus control in either direction, from processor to device takes 400ns and device to processor takes 700ns. One of the I/O devices has a data transfer rate of 100 KB/sec and employs DMA. If we employ DMA in cycle stealing mode for the first half of the bytes and burst mode for the other half, how long will it take to transfer a block of 512 bytes?

Question 3: Answer all the questions. (6 Marks)

a. If we have a RAM of 256 KB size and a data bus of 8 bits, what should be the size of the address bus? [1]

b. Suppose execution of a signed additional instruction (4FFFH + 4000H) occurred, what would be the value of Zero flag (ZF), Sign Flag (SF), Parity Flag (PF), Overflow flag (OF). [1+4]

Question 4: Answer all the questions. (8 Marks)

a. Calculate the memory location of CS and IP for the interrupt INT 7H in the interrupt vector table. [2]

b. Suppose the address 95C1H: 0FE2H has an instruction. To execute the instruction, what should be the value of CS if IP is [2+2]

(i) A827H (ii) 0156H

c. Explain briefly how 8086 sends 20 bit physical addresses to the memory unit if there are only 16 bit registers inside the internal architecture of 8086. [2]