International Islamic University Chittagong (IIUC)

Department of Computer and Communication Engineering

Midterm Examination

Program: **B.sc (Engg.)** | Semester: **Spring 2022**
Course Code: **CCE – 3501** | Course Title: **Microprocessor & Assembly Language**
Total Marks: **30** | Time: **1 Hours 30 Minutes**

(i) Answer all the questions. The figures in the right-hand margin indicate full marks.
(ii) Course Learning Outcomes (CLOs) and Bloom's Levels are mentioned in additional Columns.

Course Learning Outcomes (CLOs) of the Questions

CLO1 Gain knowledge of assembly level programming to write and test programs of moderate complexity for a real-time machine.
CLO2 Apply knowledge to design circuits for various applications using Microcontrollers.

Bloom's Levels of the Questions

Letter Symbols	R	U	Ap	An	E	C
Meaning	Remember	Understand	Apply	Analyze	Evaluate	Create

1)	**a)**	Differentiate between microprocessor, microcomputer, and microcontroller. Write the functions of the following pins: i) ALE ii) Reset Out iii) INTA	**CLO1 CLO2**	**R**	**2+3**
1)	**b)**	What is the difference between ADD and ADC instructions? Explain with examples. Make a short note on: i) Machine Cycle ii) T-state	**CLO1 CLO2**	**R/UN**	**2+3**
2)	**a)**	Explain demultiplexing of address and data bus with appropiate figure. Draw the timing diagram of Opcode fetch.	**CLO1 CLO2**	**U/R**	**3+2**
2)	**b)**	For each of the following instructions, give the new destination contents and the new settings of CF, SF, ZF, PF and OF. Suppose that flags are initially 0 in each part of this question. I. ADD AL, BL ; AL=0D H and BL=EF H II. SUB AL, BL; AL=9B H and BL=1A H	**CLO1**	**Ap**	**5**
3)	**a)**	Explain the concept of DMA with appropiate figure. State the control and status signals during different machine cycles.	**CLO1 CLO2**	**U**	**3+2**
3)	**b)**	Write the steps involved to fetch a byte in 8085. Explain the following instructions with examples i) LDAX ii) INX	**CLO1**	**U/Ap**	**3+2**
		OR			
3)	a)	Write a program to add two 8-bit numbers and store the result and value of carry flag in different memory location. Assume that the last number is the last two digits of your ID. Write a program that has a finite loop with 14 iterations.	**CLO1**	**U/Ap**	**3+2**
3)	b)	Define instruction cycle. Find the number of machine cycles, t-state and total execution time for the following instructions • MVI A, 05H • MOV A, B	**CLO1 CLO2**	**U/Ap**	**5**