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Daffodil International University

Faculty of Science & Information Technology
Department of Computer Science & Engineering
Midterm Examination, Summer 2026
Course Code: CSE 317, Course Title: Microprocessor and Microcontroller
Level:3 Term:1 Batch: 66

Time: 01:30 Hrs **Marks: 25**

Answer ALL Questions

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

1	*b)*	Trace the evolution of Intel microprocessors from the 8086 to the Pentium. Compare their architectural features and discuss how each generation improved processing performance, cache) memory management and multitasking capabilities.	[5]	CO1
2.	*a)*	Consider the following 8086 instruction: MOV AX, [2500H] Explain how the internal architecture of the 8086 microprocessor executes this instruction. Your explanation should include: 1. The role of the Bus Interface Unit (BIU) and Execution Unit (EU). 2. How the physical address is generated. 3. How the instruction is fetched from memory. 4. How the operand is accessed and transferred to the AX register. 5. The role of the instruction queue during execution.	[5]	CO2
	b)	In an 8086-based system, the MN/MX pin is set to logic 1. A DMA controller needs to transfer a large amount of data directly between memory and an I/O device.Explain how the 8086 temporarily gives up control of the system bus and later regains it after the transfer is complete. Also, explain how memory addressing and bus-cycle behavior differ when the transfer begins at an odd address involving both even and odd memory banks.	[5]	
3.	*a)*	Consider the following register contents of an 8086 microprocessor: • DS = 2500H • ES = 3600H • BX = 1200H • SI = 0300H • DI = 0100H • BP = 0800H Identify the Addressing Mode and Calculate the Physical Address (PA) for each instruction. (a) MOV AX, [BX+SI] (b) MOV AX, [BX+DI+50H] (c) MOV AX, [BP+SI+20H] (d) MOV AX, [1200H]	[4]	CO3
	b)	Write the assembly programs for the following scenario	[3+3]	

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i. A 8086-based system is used in an automated billing machine. The system performs arithmetic operations and uses conditional jumps to decide the final output. The machine follows these rules:

It first adds two 16-bit numbers stored in memory locations 3000H and 3002H.

- If the result is greater than 2000H, it applies a premium charge.
- If the result is equal to 2000H, it applies a standard charge.
- If the result is less than 2000H, it applies a discount.

ii. A banking system subtracts the withdrawal amount from the account balance.

If the result becomes zero, the account is marked as empty.
If the result becomes negative, the transaction is rejected.
If the result is positive, the transaction is successful.

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