DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF TECHNOLOGY
COMPUTER ENGINEERING
THIRD SESSIONAL

SUBJECT: (23CE417) COMPUTER SYSTEM ARCHITECTURE

Examination	**: B.Tech Semester IV**		
Date	**: 19-03-2025**	**Seat No.**	**: CE050**
Time	**: 12:00 PM to 1:15 PM**	**Day**	**: Wednesday**
		Max. Marks	**: 36**

INSTRUCTIONS:

1. Figures to the right indicate maximum marks for that question.
2. The symbols used carry their usual meanings.
3. Assume suitable data, if required & mention them clearly.
4. Draw neat sketches wherever necessary.

Q.1 Do as directed. [12]

CO1 A (a) State the difference between Mealy and Moore machines. [2]

CO1 U (b) Write the control signals required to perform ADD instruction for the accumulator based Processor [2]

CO1 A (c) Compare Horizontal and Vertical Microinstructions. [2]

CO2 R (d) Find the delay for the given code. Consider the clock frequency as 2MHz. [2]

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        MVI A,34H   7T states
LOOP    DCR A       4T
        NOP         4T
        JNZ LOOP    10/7 T
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CO2 U (e) Explain how 8085 Interrupt Control is achieved with all the types of interrupt and their corresponding pins. [2]

CO2 A (f) Draw the Timing Diagram of **MOV B, A** instruction in 8085. Properly show the Address, Data and Control signals for the same. [2]

Q.2 Attempt *Any TWO* from the following questions. [12]

CO5 N (a) Explain the use of different modes in DMA. Consider a computer with a 4MHz processor. If the DMA controller can transfer 8 bytes in 1 cycle from a device to the main memory through cycle stealing at regular intervals. What is the data transfer rate (in bps) of the DMA controller if 1% of the processor cycles are used for DMA? [6]

CO5 N (b) Show the various ways to connect the shared system bus with the IO devices. [6]

CO5 N (c) What are the responsibilities of IO Interface? Explain different modes of IO transfer with their advantages and disadvantages. [6]

Q.3 Attempt the following questions. [12]

CO1 N (a) State the factors on which microinstruction length depends [3]

CO1 U (b) Design a control unit for a GCD processor using ONE HOT method. [9]

OR

Q.3 Attempt the following questions. [12]

CO1 N (a) i. Show the basic structure of a microprogrammed control unit(Wilke's Design). [3]
ii.A micro programmed control memory supports 256 instructions .Every instruction on average consumes 8 micro operations .The system supports 16 flag conditions and 48 control signals. If the horizontal micro programming is used, what is the size of each control word let 1 address control instruction is used. [3]

CO1 U (b) Explain with block diagrams the control unit organization. [6]

Bloom's Taxonomy levels: R-Remembering, U- Understanding, A-Applying, N-Analyzing, E- Evaluating, C-Creating.