GUJARAT TECHNOLOGICAL UNIVERSITY
BE- SEMESTER–VII EXAMINATION – WINTER 2025

Subject Code: 3160712 **Date: 17-11-2025**

Subject Name: Microprocessor and Interfacing

Time: 02:30 PM TO 05:00 PM **Total Marks: 70**

Instructions:
1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1*	**(a)**	Describe the components of a microprocessor and their roles.	**03**
	(b)	Detail the process by which a microprocessor communicates with memory and I/O devices, including the significance of bus organization.	**04**
	(c)	Draw the architectural diagram of 8085 microprocessor and list out the following: 1. General Purpose Registers 2. Special Purpose registers with their functions 3. Flags in the flag register with required explanation	**07**
Q.2	**(a)**	List three control signals generated by the 8085 microprocessor and their purposes.	**03**
	(b)	Explain the process of demultiplexing buses in the 8085 microprocessor.	**04**
	(c)	Describe the entire process of executing an instruction by the 8085 microprocessor, including the roles of the ALU, registers, and control unit.	**07**

<div align="center">OR</div>

	(c)	Describe in detail the instruction cycle, including machine cycles and T-states, of the 8085 microprocessor.	**07**
Q.3	**(a)**	State the addressing modes and size of the following instructions: 1. MOV B, M 2. MVI A, 16H 3. LDA 2050H	**03**
	(b)	Explain instruction set of 8085 microprocessor.	**04**
	(c)	2100: MVI A, 55H ADI 45H identify the byte size of the ADI 45H command. Illustrate the execution process of ADI 45H by creating a diagram that includes the machine cycles it undergoes. In your diagram, indicate the states of the address bus, data bus, and control signals (*RD, *WR, IO/*M, ALE) during each T-state. Also, provide the names of the machine cycles involved.	**07**

Q.3 **(a)** Explain addressing modes of 8085 microprocessor. **03**

(b) Specify the size, addressing mode, required Machine cycles, T-States and function for following instructions: **04**
1. MOV B, M
2. SHLD 2300H

(c) Enlist the error in the below assembly language code **07**
MVI B,20H
MVI D,99H
MVI C, D
LDAX 2099h
ADD 01H
STAX 3000H.
Provide the solution after doing the correction at your end.

Q.4 **(a)** Define the term "interfacing" in the context of microprocessors. **03**

(b) Explain how interrupts are managed in the 8085 microprocessor. **04**

(c) Create an assembly language program for the 8085 microprocessor that performs subraction of two 8bit numbers. Please specify the memory address of each instruction, and include a flowchart for the program. **07**

OR

Q.4 **(a)** Explain the purpose of the Programmable Peripheral Interface 8255A. **03**

(b) Describe the process of interfacing an I/O device with the 8085 microprocessor. **04**

(c) Create an assembly language program for the 8085 microprocessor that performs addition of two 8bit numbers. Please specify the memory address of each instruction, and include a flowchart for the program. **07**

Q.5 **(a)** Draw Block Diagram and Pin Diagram of 8259 Microcontroller. **03**

(b) Describe how to use the ADI and SUI instructions in an 8085-assembly language program to perform basic arithmetic operations. Provide a short example program that adds 25H to the accumulator and then subtracts 10H from the result. **04**

(c) Provide an overview of the 80286 and 80386 microprocessors, highlighting their architectural advancements compared to the 8086. **07**

OR

Q.5 **(a)** List and explain the interrupt available in microprocessor 8085. **03**

(b) Illustrate how conditional branch instructions like JNZ (Jump if Not Zero) are used in 8085 assembly language programming. Provide an example program snippet that utilizes JNZ to perform an operation repeatedly until a condition is met. **04**

(c) Provide a detailed explanation of the logical block diagram of the 8086 microprocessor and the functions of its major components. **07**

*It is advisable to put fundamental questions of respective subject in Q1, as it is compulsory question.

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