Seat No./Enrollment No.: _____

GUJARAT TECHNOLOGICAL UNIVERSITY
BACHELOR OF ENGINEERING – SEMESTER 6 – EXAMINATION – SUMMER 2026

Subject Code: 3160712 **Date: 22/05/2026**

Subject Name: Microprocessor and Interfacing

Time: 10:30 AM TO 01:00 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.**

Q.1	**(a)**	Define (1) Microprocessor (2) Program Counter (3) Accumulator	**03**
	(b)	Explain general purpose registers in 8085 Microprocessor	**04**
	(c)	Draw and explain Pin diagram of 8085 Microprocessor	**07**
Q.2	**(a)**	Explain functions of following pins in 8085 (1) TRAP (2) SID (3) HLDA	**03**
	(b)	Explain Memory Write Machine Cycle of 8085 with suitable diagram	**04**
	(c)	Elaborate different addressing modes in 8085 with suitable examples	**07**
		OR	
Q.2	**(c)**	Draw the memory interface 4kB of EPROM with starting address from 0000H and 2kB of RAM with starting address followed by EPROM with 8085 Microprocessor	**07**
Q.3	**(a)**	Define (1) Assembler (2) Linker (3) Debugger	**03**
	(b)	Describe any four data transfer instructions in 8085 with examples	**04**
	(c)	Write an assembly language program to add two 16-bit numbers stored in memory with carry in 8085 simulator. Store result in the memory	**07**
		OR	
Q.3	**(a)**	Specify byte size of each instruction (1) ADD B (2) MVI A,32H (3) CMA	**03**
	(b)	Describe any four arithmetic instructions in 8085 with examples	**04**
	(c)	Write an assembly language program in 8085 to arrange five 8-bit numbers in ascending order stored at memory location starting from 1000H	**07**
Q.4	**(a)**	Define Stack. Explain importance of Stack in 8085 Microprocessor	**03**
	(b)	Differentiate the memory-mapped IO with the IO-mapped IO	**04**
	(c)	Explain various operating modes of 8255A	**07**
		OR	
Q.4	**(a)**	Explain following instructions: (1) RIM (2) SHLD (3) RRC	**03**
	(b)	Explain working of CALL and RET instructions in 8085 microprocessor with example	**04**
	(c)	Draw and explain architecture of 8259A	**07**
Q.5	**(a)**	Describe different types of segment registers in 8086 Microprocessor	**03**
	(b)	Explain flag register in 80286 Microprocessor	**04**

	(c)	Draw and explain BIU and EU in 8086 Microprocessor	**07**

OR

Q.5	**(a)**	Differentiate 8086, 80286 and 80386	**03**
	(b)	Explain operating modes of 8086 Microprocessor in detail	**04**
	(c)	Draw and explain architecture of 80286 Microprocessor	**07**

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Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) EXAMINATION – SUMMER 2024

Subject Code:3160712 Date:17-05-2024

Subject Name:Microprocessor and Interfacing

Time:10:30 AM TO 01:00 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)**	Define (1) Microprocessor (2) System Bus (3) Instruction Cycle	**03**
	(b)	Explain 8085 Programming Model with diagram	**04**
	(c)	Draw and explain Pin diagram of 8085 Microprocessor	**07**
Q.2	**(a)**	Define (1) Accumulator (2) Program Counter (3) Stack Pointer	**03**
	(b)	Draw timing diagram of instruction MVI A, 32H	**04**
	(c)	Elaborate different addressing modes in 8085 with suitable examples	**07**
		OR	
	(c)	Draw the memory interface 4kB of EPROM with starting address from 0000H and 2kB of RAM with starting address followed by EPROM with 8085 Microprocessor	**07**
Q.3	**(a)**	Explain instruction format of 8085 instructions	**03**
	(b)	Describe any four arithmetic instructions in 8085 with examples	**04**
	(c)	Explain counters and time delay with suitable example. Also specify various applications of counters and time delay.	**07**
		OR	
Q.3	**(a)**	Explain classification of instructions based on byte size with examples	**03**
	(b)	Describe any four data transfer instructions in 8085 with examples	**04**
	(c)	Write an assembly language program in 8085 to arrange five 8-bit numbers in ascending order stored at memory location starting from 3000H	**07**
Q.4	**(a)**	Define Stack. Explain PUSH and POP instructions	**03**
	(b)	Explain classification of Interrupts in 8085 Microprocessor	**04**
	(c)	Draw and explain block diagram of 8255A	**07**
		OR	
Q.4	**(a)**	Differentiate IO-mapped IO and Memory-mapped IO	**03**
	(b)	Explain BSR Mode in 8255A	**04**
	(c)	Draw and explain block diagram of 8259A	**07**
Q.5	**(a)**	Describe flag register in 8086 Microprocessor	**03**
	(b)	Explain register organization of 80286 Microprocessor	**04**
	(c)	Draw and explain logical block diagram of 8086 Microprocessor	**07**
		OR	
Q.5	**(a)**	Describe protected virtual address mode in 80286 Microprocessor	**03**
	(b)	Explain concepts of segmentation in 8086 Microprocessor	**04**
	(c)	Draw and explain architecture of 80386 Microprocessor	**07**

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Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI EXAMINATION – SUMMER 2025

Subject Code: 3160712 Date: 22-05-2025

Subject Name: Microprocessor and Interfacing

Time: 10:30 AM TO 01:00 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)**	Explain bus organization in 8085 Microprocessor	**03**
	(b)	Explain general purpose registors in 8085 Microprocessor	**04**
	(c)	Explain de-multiplexing of AD_0 – AD_7 in 8085 microprocessor with suitable diagram	**07**
Q.2	**(a)**	Explain function of following 8085 pins (1) READY (2) HLDA (3) X1 & X2	**03**
	(b)	Draw timing diagram of instruction MOV A , B	**04**
	(c)	Explain flag register of 8085 Microprocessor with diagram	**07**
		OR	
	(c)	Draw and explain architecture of 8085 Microprocessor	**07**
Q.3	**(a)**	Explain function of given instructions : (1) DAD (2) LHLD (3) XCHG	**03**
	(b)	Explain indirect addressing mode in 8085 with examples	**04**
	(c)	Write an assembly language program to find smallest number from numbers stored at memory location 1000H and 1001H. Store result on memory location 2000H	**07**
		OR	
Q.3	**(a)**	Explain function of given instructions : (1) ANI (2) RLC (3) SIM	**03**
	(b)	Explain registor addressing mode in 8085 with examples	**04**
	(c)	Write a set of 8085 assembly language instructions to generate a 1 second delay, if the crystal frequency is 1 MHz.	**07**
Q.4	**(a)**	Define (1) Stack (2) Counter (3) Time Delay	**03**
	(b)	Explain subroutine in 8085 Microprocessor with example	**04**
	(c)	Draw and explain input and output handshake mode of 8255A	**07**
		OR	
Q.4	**(a)**	Differentiate maskable and non-maskable interrupts in 8085 Microprocessor	**03**
	(b)	Explain control registor in 8255A with diagram	**04**
	(c)	Explain Programmable Interrupt Controller 8259A	**07**
Q.5	**(a)**	Describe operating modes in 8086 Microprocessor	**03**
	(b)	Explain segment registers in 8086 Microprocessor	**04**
	(c)	Draw and explain architecture of 80286 Microprocessor	**07**
		OR	
Q.5	**(a)**	Differentiate GDT and LDT in 80286 Microprocessor	**03**
	(b)	Explain registor organization in 80386 Microprocessor	**04**
	(c)	Draw and explain pin diagram of 8086 Microprocessor	**07**

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Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) EXAMINATION – SUMMER 2023

Subject Code:3160712 Date:06-07-2023

Subject Name:Microprocessor and Interfacing

Time:10:30 AM TO 01:00 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)**	Differentiate between Microcontroller and Microprocessor.	**03**
	(b)	Explain the purpose of the following signals in 8085 1. READY 2. AD0-AD7 3. HOLD 4. IO/ M 5. INTR	**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)**	If an 8085 is an 8 bit microprocessor, how many bits can be loaded by the 3 register pairs (BC, DE, HL, or SP) using LXI?	**03**
	(b)	Define significance of ALE pin with an example or a diagram.	**04**
	(c)	If an 8085 microprocessor has a 2 MHz crystal frequency, what is the assembly language code required creating a delay of 1 second?	**07**
		OR	
	(c)	Draw the interfacing of a 4KB EPROM having a starting address0000h and two 2KB static RAMs having starting addresses 4000hand 8000h, respectively, with 8085 microprocessor. Use demultiplexed address/data lines and use 3-to-8 decoder (74LS138).	**07**
Q.3	**(a)**	State the addressing modes of the following instructions: 1. CMA 2. LDA 2500H 3. ANA M 4. LXI SP	**03**
	(b)	Using stack operations, write an 8085 assembly program to set the sign, zero, and parity flags while resetting the auxiliary carry and carry flags.	**04**
	(c)	Can you describe the process by which the 8085 processor executes the CALL instruction, and how does the timing diagram illustrate this sequence of events?	**07**

OR

Q.3	**(a)**	An array of ten data bytes are stored from memory locations 2100H onwards. Write an 8085 assembly language program to find the minimum number from this array and store it to new memory location 2200H.	**03**
	(b)	Can you provide a diagram illustrating the de-multiplexing of the Address/Data bus (AD0-AD7) in the 8085 microprocessor?	**04**
	(c)	Explain the different addressing modes available in the 8085 microprocessor, with examples to illustrate each mode.	**07**
Q.4	**(a)**	Explain instruction set of 8085.	**03**
	(b)	Compare the memory-mapped IO with the standard IO-mapped IO	**04**
	(c)	Can you provide an example program in assembly language that initializes a single 8259 Programmable Interrupt Controller (PIC) connected to an 8085 processor?	**07**

OR

Q.4	**(a)**	List the Software and Hardware interrupts of 8085?	**03**
	(b)	Discuss the operation of the 8255 Programmable Peripheral Interface and how it is interfaced with an 8085 microprocessor. What are the different modes of operation and how are they selected?	**04**
	(c)	How does the instruction sequence MVI A, 07H RLC MOV B, A RLC RLC ADD B Use the values stored in registers A and B to execute a specific mathematical function in an assembly language program?	**07**
Q.5	**(a)**	Differentiate 80286 with 80386 microprocessor.	**03**
	(b)	Describe the importance of bus interface unit (BIU) and execution unit (EU) the 8086 microprocessor.	**04**
	(c)	Draw and explain internal architecture and PIN diagram of 8086 microprocessor.	**07**

OR

Q.5	**(a)**	Differentiate between the real mode and protected mode of the 80286 microprocessor.	**03**
	(b)	How the physical addresses are calculated from segment register in 8086 microprocessor?	**04**
	(c)	Describe the architecture of the 80286 with a neat block diagram.	**07**

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Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) EXAMINATION – SUMMER 2022

Subject Code:3160712 Date:03/06/2022

Subject Name:Microprocessor and Interfacing

Time:10:30 AM TO 01:00 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)**	Explain the flag register in 8085 microprocessor.	**03**
	(b)	Explain the following pins of 8085: (1) INTR (2) HOLD (3) SOD (4) READY	**04**
	(c)	Draw the block diagram of internal architecture of 8085 and explain its working.	**07**
Q.2	**(a)**	Explain the following instructions 1. LHLD 2. RAL 3. DAA	**03**
	(b)	Explain demultiplexing of data and address bus of 8085.	**04**
	(c)	Explain the timing diagram of the instruction MOV C,A (4FH) stored in location 2005H is being fetched. Define T-state, Machine cycle and Instruction cycle.	**07**
		OR	
	(c)	Explain interfacing of 4KB EPROM with 8085 using decoder and gates as required. Assume starting address as 0000H.	**07**
Q.3	**(a)**	Write a program to find 2's complement of a number stored at 2050H and store result at 2055H.	**03**
	(b)	Compare memory mapped I/O and I/O mapped I/O.	**04**
	(c)	What are interrupts? List and explain the interrupt available in microprocessor 8085?	**07**
		OR	
Q.3	**(a)**	Explain the concept of stack.	**03**
	(b)	Explain arithmetic instructions of 8085.	**04**
	(c)	Write an 8085 program to copy block of ten numbers starting from location 2050h to locations starting from 3050h.	**07**
Q.4	**(a)**	State the difference between PUSH and POP instruction.	**03**
	(b)	Explain the generation of control signals in 8085.	**04**
	(c)	Draw the internal block diagram of 8259A and explain the functions of each block in detail.	**07**
		OR	
Q.4	**(a)**	Explain Machine level language and Assembly level language with examples.	**03**
	(b)	Explain 8085 bus organization.	**04**
	(c)	Write a program to count continuously in hexadecimal from FFH to 00H in a system with a clock period of 0.5 μs. Use register C to set up 1 millisecond delay between each count and display the number at the output port1.	**07**

Q.5	**(a)**	How many memory locations can be addressed by microprocessor with 14 address lines? Also specify how many address lines are required for 2KB memory.	**03**
	(b)	Load the hexadecimal numbers 56H and A9H in registers D and E respectively and add them. If sum is greater than FFH, display 01H at output PORT0; otherwise display sum.	**04**
	(c)	Draw the internal block diagram of 8255 and explain the functions of each block in details.	**07**

OR

Q.5	**(a)**	Explain the given pins of 8086. 1. ALE 2. DEN 3.MN/MX	**03**
	(b)	Explain the modes of operation of 8086 microprocessor.	**04**
	(c)	Explain the block diagram of 8086 microprocessor.	**07**

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