CENTRAL INSTITUTE OF TECHNOLOGY KOKRAJHAR
(Deemed to be University)
KOKRAJHAR :: BTR :: ASSAM :: 783370
END – SEMESTER EXAMINATION
DIPLOMA

Session: January-June, 2025 Semester: 4th Time: 3 Hrs. Full Marks: 100
Course Code: **DIE 403** Course Title: **Microprocessor**

QUESTION NO. 1 IS COMPULSORY AND ANSWER ANY FOUR (4) FROM THE REST

Q1:

a) Choose the correct answer. **(5-marks)**

i) Which of the following registers is not a general-purpose register in 8085?

a) M
b) B
c) L
d) E

ii) The 'M' register in 8085 refers to:

a) Memory location pointed by HL pair
b) Accumulator
c) Flag register
d) All of the above

iii) The arithmetic logic unit (ALU) performs:

a) Only arithmetic operations
b) Only logic operations
c) Arithmetic and logic operations
d) Data transfer operations

iv) Which pin is used to send the clock pulses to the 8085 microprocessor?

a) CLK IN
b) RESET IN
c) INTR
d) ALE

v) Which of the following interrupts is non-maskable in 8085?

a) INTR
b) RST 5.5
c) RST 7.5
d) TRAP

b) State True or False. If false, write the correct statement. **(5-marks)**

i) The maximum clock frequency of the 8085 microprocessor is 5 MHz.
ii)
iii) The instruction NOP stands for New Operation.
iv) The function of the IN instruction in 8085 is to Input data from port to accumulator.
v) The 8085 microprocessor comes with 42- pins.

c) Fill in the gaps with correct answer. **(5-marks)**

i. The instruction STA 2000H stores the accumulator's content into memory location _____.
ii. The 8085 requires _____ T-states for the Opcode Fetch cycle.
iii. The _____ machine cycle is used to read data from memory.

iv. The ___ pin is used to demultiplex the address and data bus.
v. The instruction which complements (inverts) the accumulator is_____.

d) Match the followings. **(5-marks)**

Column-A (Flag)	**Column-B (Condition)**
1. No of bytes used by the instruction LXI H, 2000H	*a. Eight (8)*
2. No of bytes used by the instruction CMA	*b. Five (5)*
3. No of bytes used by the instruction MVI B, 21 H	*c. One (1)*
4. No of interrupts available in 8085	*d. Two (2)*
5. Size of OPCODE in bits	*e. Three (3)*

Q2:

a) Assemble the following program starting with ML: C000 H. **(5-marks)**

ML	***Mnemonics***
C000H,	……MVI A, F9H
	……. STA D000 H
	……. LXI H, C500H
	……. MOV M, A
	……. NOP
	……. RST 1

b) State how many times the following loops will be executed: **(5-marks)**

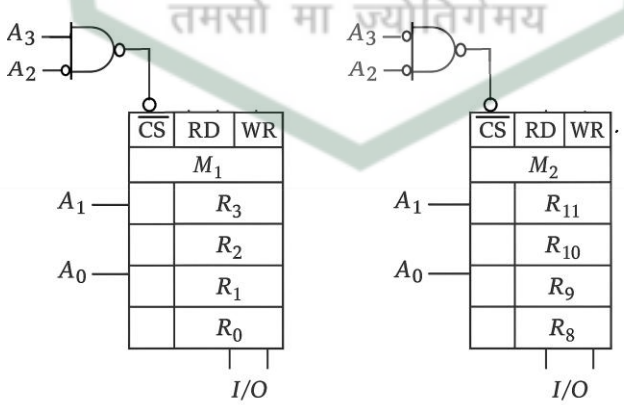
i)

Label	*Mnemonics*
	MVI C, 03H
"L-1"	DCR C
	JNZ "L-1"

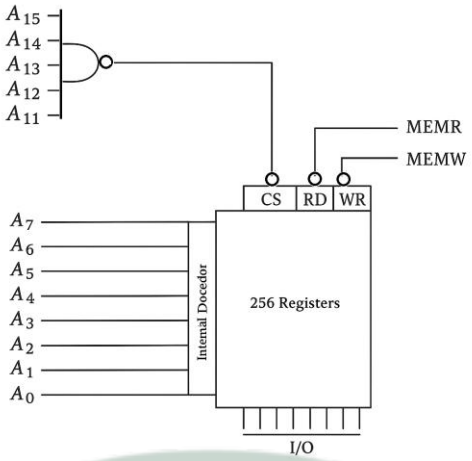
ii)

Label	*Mnemonics*
	MVI A, FFH
"L-2"	INR A
	JNZ "L-2"

c) Write the addresses of the eight registers as can be seen in the following figure. **(5-marks)**



d) Identify the memory address range(s) for the following interfacing. **(5-marks)**



Q3:

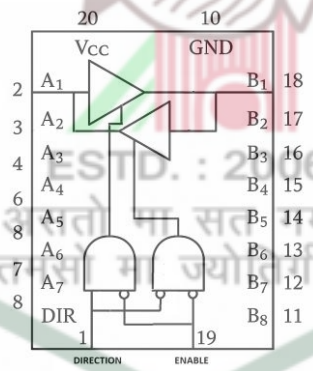
a) Draw the timing diagrams for the following two instructions: **(10-marks)**

(i) (ii)

ML	Mnemonics	Hex Code
D123 H	IN 02 H	DB
D124 H		02

ML	Mnemonics	Hex Code
E456 H	STA 654E	32
E457 H		4E
E458 H		65

b) Write the functional table for the following bidirectional buffer. **(5-marks)**



c) Write an assembly language program to create a 1 millisecond delay on an 8085-microprocessor running at 5MHz. **(5-marks)**

Q4:

a) Write an assembly language program for the 8085 microprocessor that exchanges a block of 10 bytes (0A H) between memory locations B000H-B009H and E000H-E009H. **(6-marks)**

b) Compare and contrast Memory-Mapped I/O and I/O-Mapped (Peripheral mapped I/O) Interfacing techniques in microprocessor-based systems. **(6-marks)**

c) Calculate the 16-bit count value to obtain a loop delay of 1 second. **(6-marks)**

Label	*Mnemonics*	*T-states*
	MVI B,14H	7T
Loop-2:	LXI H,16-bit	10T
Loop-1:	DCX H	6T
	MOV A, H	4T
	ORA L	4T
	JNZ Loop-1	10/7T
	DCR B	4T
	JNZ Loop-2	10/7T

d) If SP = 2050H and memory locations 2050H and 2051H contain 12H and 34H, what will be the contents of register pair BC after POP B? **(2-marks)**

Q5:

a) Write an assembly language program for the 8085 microprocessors to swap the contents of register pairs DE and HL using PUSH and POP. **(5-marks)**
b) Draw the functional block diagram of the 8085 microprocessor and label its key components. **(7-marks)**
c) What is foldback (mirror memory) in the context of the 8085 microprocessors? **(3-marks)**
d) Break down the machine cycles for LXI H, 2050H and specify the T-states in each cycle. **(5-marks)**

Q6: Write short notes on: (any four) **(5x4=20 marks)**

- 8085 Registers & Their Uses
- Instruction Types & Examples
- Flags Register & Conditional Jumps
- Applications of 8085 microprocessor
- Machine Cycles & T-States

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