Total number of printed pages: 6 **D/ 4th/ DIE403**

2024

MICROPROCESSOR

Full Marks: 100

Time: Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions.*

1 a) Short answer questions: 1 x 10

i. What is the size of the data bus in the 8085 microprocessor?
ii. What is the size of the general-purpose registers in the 8085 microprocessor?
iii. How many flags are there in the flag register of the 8085 microprocessor?
iv. What is the maximum amount of memory addressable by the 8085 microprocessor?
v. What is the function of IO/M signal in the 8085?
vi. State the function of ALE signal.
vii. Why data bus is bi-directional?
viii. How does the microprocessor differentiate among positive number and a negative number?
ix. What is STA in data transfer instruction?
x. Give the difference between JZ and JNZ instructions.

b) Fill in the blanks: 1 x 5

i) HLT Opcode means……of the program.
(Start/End/Middle)

ii) In 8085 microprocessor, ……is the first machine cycle of an instruction.
(Memory read/ Memory write/ Opcode fetch)

iii) Maximum number of I/O that can be addressed by the 8085 is ……..
(1/ 258/ 4096/ 65535)

iv) ……..Register pair used to indicate memory.
(BC/ DE/ HL)

v) Total numbers of output pins in 8085 microprocessor are.....

(10/ 20/ 30/ 40)

c) Specify the size of the following instructions: 5

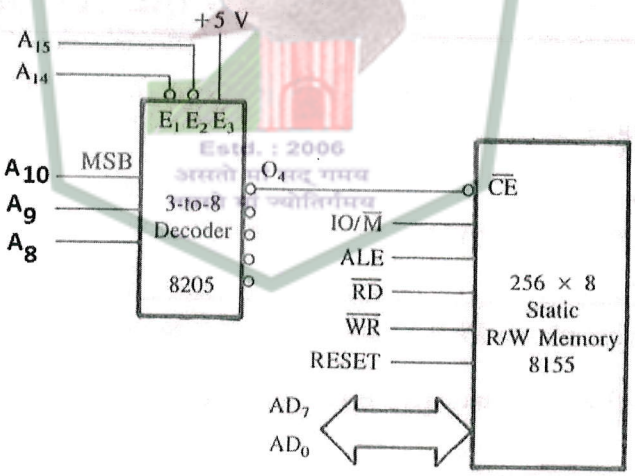
i. MOV B, M
ii. CPI 23 H
iii. LDA ED23 H
iv. LHLD
v. JNZ D567 H

2 a) Draw and explain the timing diagram of STA EA87 H instruction. 10

Assume the instruction is written as:

Memory Location	Mnemonics	Hex Code
E000 H	STA EA87 H	32
E001 H		87
E002 H		EA

b) 10



Identify the memory address range of the above interfacing. Also, mention the fold back /mirror memory ranges.

3 a) Make a comparison between Memory-mapped-I/O and I/O-mapped I/O technique. 5

b) Write an assembly language program to find the smallest number from the data array as depicted below. 10

Memory location	Stored numbers
E100 H	02
E101 H	09
E102 H	01
E103 H	08
E104 H	16
E105 H	A2
E106 H	B3
E107 H	1C
E108 H	2E

c) The memory address of the last location of a 4kB memory chip is DFFF H. Find the starting address. 2

d) Identify the machine cycles in the following instructions: 3

i) STA D450 H
ii) ADI 97 H
iii) MOV C.A

4 a) Name the flags in 8085 microprocessor and explain them with a suitable example. 5

b) Calculate the COUNT to obtain a 300μSec loop delay and express the value in Hex. 10

		T-States
	MVI D, COUNT	4
LOOP:	MOV A, D	4
	NOP	4
	NOP	4
	DCR A	4
	JNZ LOOP	10/7

c) Explain how many times the following two loops will be executed: 5

(i)

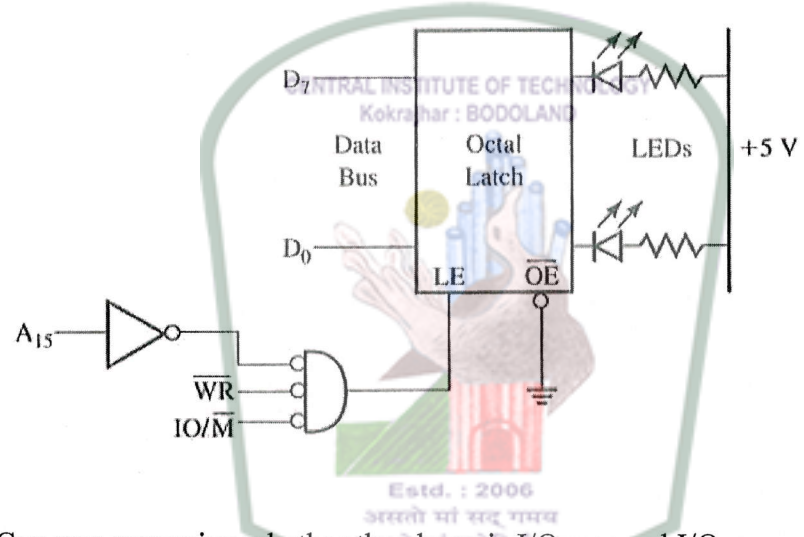
```
        LXI B, 0009H
LOOP:   DCX B
        JNZ LOOP
```

(ii)

```
        LXI B, 0009H
LOOP: DCX B
        MOV A,B
        ORA C
        JNZ LOOP
```

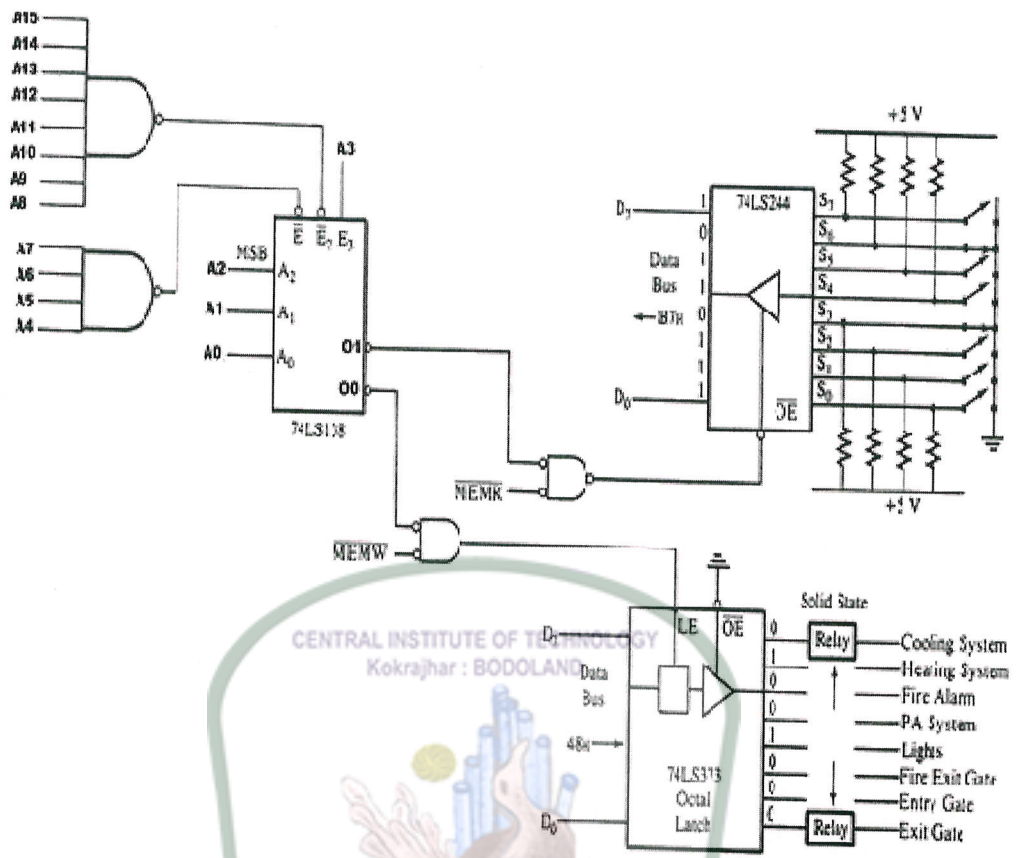
5 a) Draw an interfacing circuit for a 4Kbyte EPROM using a 3 to 8 decoder such that the memory address range will be A000H-AFFFH. 8

b) 6



Can you recognize whether the above is I/O mapped I/O or memory mapped I/O scheme? What is the PORT address if all the don't care lines are assumed to be zero?

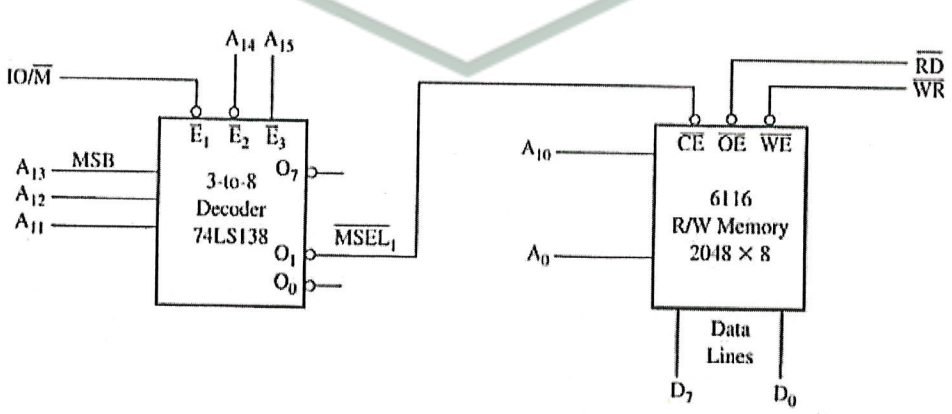
c) 6



i) Identify the I/O interfacing technique.

ii) State the addresses of the input & output device.

6 a) 6



In the above figure, exchange the address lines A12 and A14, and identify the memory map

b) State the need to demultiplexing the bus AD0-AD7. How is demultiplexing done? 4

c) What will be the outputs of the following programs? 10

i)
MVI A, 00 H
DCR A
RST 1

ii)
MVI A, 11 H
ADD A
RST 1

iii)
LXI H, FFFF H
INX H
RST 1

iv)
MVI A, FF H
INR A
RST 1

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