Total number of printed pages: **5**

UG/5th Semester/UIE501

2024

Microprocessor & Microcontroller

Full Marks: 100

Time: Three hours

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

Answer ***any five*** *questions.*

1. a) Calculate the COUNT to obtain a 250μSec loop delay and express the value in Hex. 5

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

b) Explain how many times the following two loops will be executed: 3+3

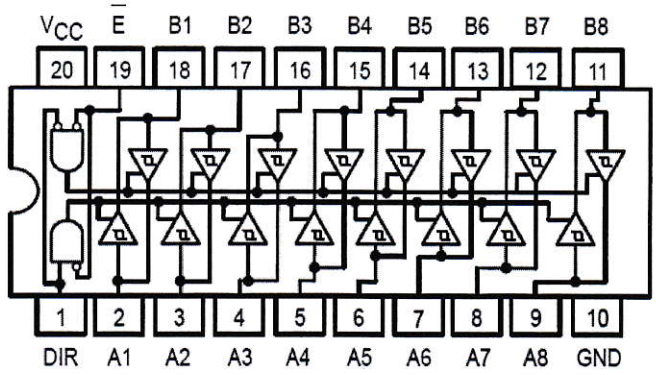
(i)

```
        LXI D, 000AH
LOOP:   DCX D
        JNZ LOOP
```

(ii)

```
        LXI D, 000AH
LOOP:   DCX D
        MOV A,E
        ORA D
        JNZ LOOP
```

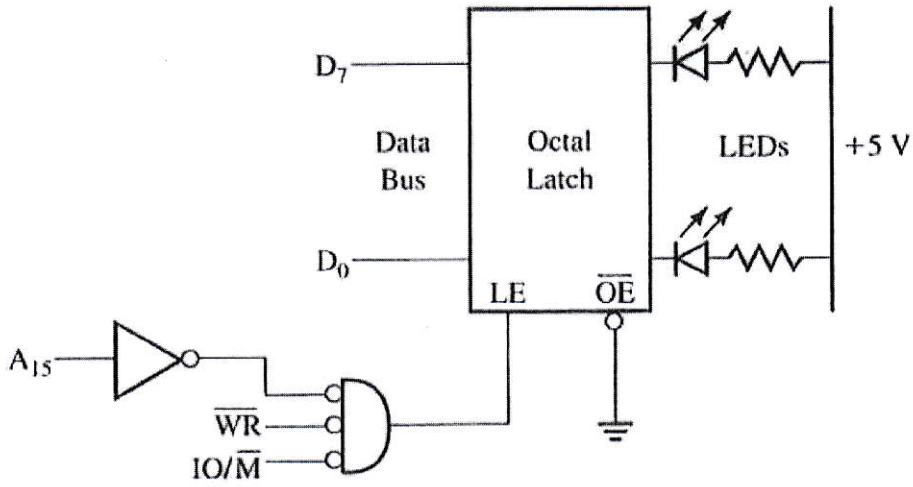
c) 4



For the bidirectional buffer shown above, complete the operations (data flow direction) in following functional table for the given inputs.

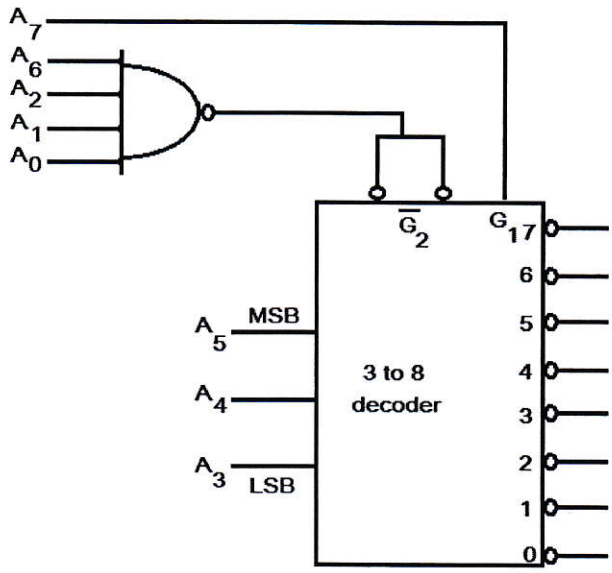
Enable Pin (19)	**Direction Control Pin (1)**	**Operation**
Low	Low	?
Low	High	?
High	Low	?
High	High	?

d) 5



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?

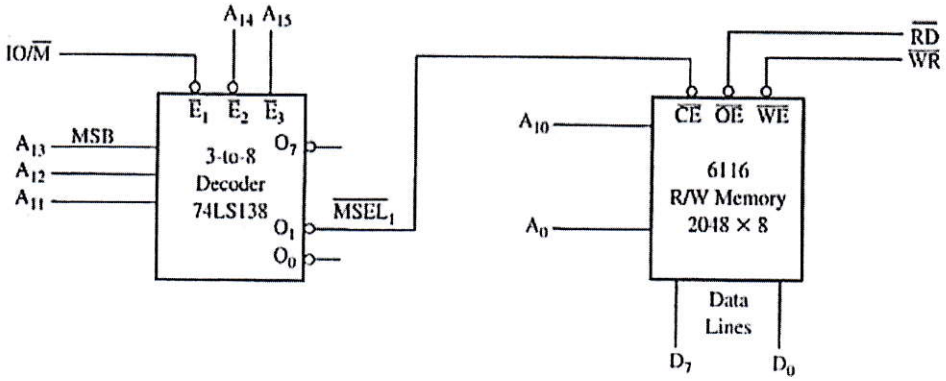
2. a) 4



Specify the o/p line that will go low if the input to the 3 to 8 decoder is as below:

A_7	A_6	A_5	A_4	A_3	A_2	A_1	A_0
1	1	1	1	0	1	1	1

b) 5



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

c) Recognize the machine cycles in the following instructions: 4

- STA D237 H
- LDA A01BH
- JMP E000 H
- CALL A000 H

d) Draw an interfacing circuit for a 4Kbyte EPROM using a 3 to 8 decoder such that the memory address range will be C000H-CFFFH. 7

3. a) Write an assembly language program for 8085 to find largest number in an array of sixteen numbers of data which is store in memory location starting from D000H and store your result in C000H. 5

   b) If the clock frequency is 2 MHz, what is the time required executing an instruction of 18 T- states? 2

   c) Draw a circuit to implement **RST-3** instruction[Hex code: DF H] 5

   d) Calculate the values of the LSB, MSB and full scale output for an 8-bit DAC for the 0 -15 V range. 4

   e) Compare the similarities and differences between PUSH/POP and CALL/RET instruction. 4

4. a) Describe the interpretation of the accumulator bit pattern for the SIM-instruction. 5

   b) How 8085 instructions are classified as 1-byte, 2-byte and 3-byte instructions? Give examples of each. 5

   c) What do you mean by fold back or mirror memory? Illustrate with an example. 6

   d) What is meant by maskable interrupts? 2

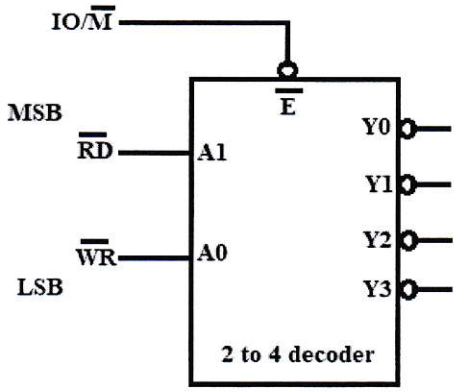
   e) What is the maximum number of input-output devices that can be connected in 8085 using I/O mapped I/O technique? 2

5. a) List the major components of the 8279 keyboard/display interface, and explain their functions. 6

   b) Make a comparison between Memory-Mapped I/O and Peripheral I/O technique. 5

   c) Draw and explain the bus timing diagram of the instruction **STA D050H**. Also, find the time required by the microprocessor to execute this instruction, if the clock frequency is 5 MHz. 5

   d) Identify the control signals that are generated at the output of the 2 to 4 decoder as shown below: 4



6. Write short notes on : (any Four) 5x4

   a) 8085 interrupts

   b) Tri-State Devices

   c) High level language and low level language

   d) Memory devices

7. a) Design a 8-bit register (8 input lines and 8 output lines) to store 8 bits using flip flops. 4

   b) Write an assembly language program for 8085 Microprocessor to multiply two 8-bit Data. 5

   c) Draw the functional block diagram of 8085 Microprocessor and explain the functions of each blocks. 7

   d) What do you mean by de-multiplexing of lower order address - data bus? How it is done? 4

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