

**Department of Higher Education  
University of Computer Studies, Yangon  
Third Year (B.C.Tech.)**

**Final Examination**

**Microprocessor Architecture and Interfacing (CT 306)**

**October, 2018**

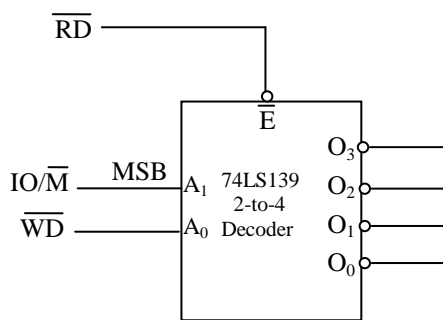
**Answer all questions.**

**Time allowed: 3 hours**

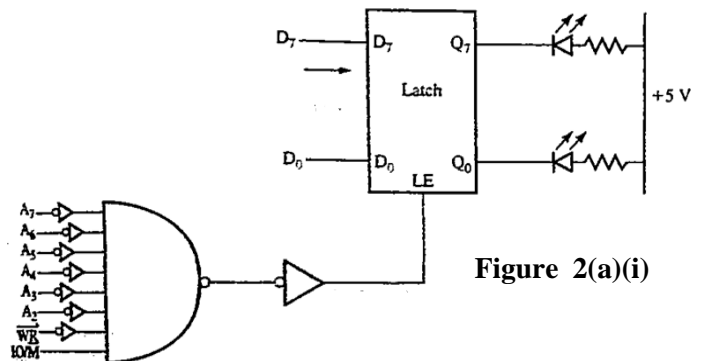
**1(a)(i)** Identify appropriate control signals that are generated at the output of 2-to-4 decoder in Figure 1(a)(i).

**(ii)** Explain why the number of output ports in the peripheral-mapped I/O is restricted to 256 ports. If an output and input port can have the same 8-bits address, how does the 8085 differentiate between the ports? Specify the two signals that are used to latch data in an output port. (10 marks)

**(b)** Instruction byte 4FH ( MOV C,A) is being fetched from the memory location 2005H. Illustrate the timing of data flow. (10 marks)



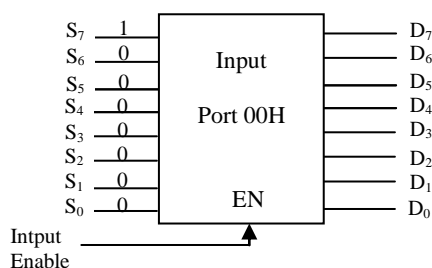
**Figure 1(a)(i)**



**Figure 2(a)(i)**

**2(a)(i)** Identify the port addresses in Figure 2(a)(i). Is it partial or absolute decoding?

**(ii)** If the switch  $S_7$  of the input PORT0 in Figure 2(a)(ii) connected to the data line  $D_7$  is at logic 1 and other switches are at logic 0, specify the contents of the accumulator when the instruction **IN PORT0** is executed. Which instruction is used to display the value of accumulator. (10 marks)



**Figure 2(a)(ii)**

**(b)(i)** Which logics can be used to setting and resetting the specific bits. How are they operated them?

**(ii)** Write instructions to (10 marks)

- 1) Load the data byte 7FH in register B and 82H in register C,
- 2) Mask the high-order bits ( $D_7$ -  $D_4$ ) from both the data bytes,
- 3) Exclusive-OR the low-order bits ( $D_3$ -  $D_0$ ),
- 4) Display the answer.

Specify the answer you would expect at the output port.

**3(a)** A set of eight data bytes is stored in memory locations starting at 2055H. Check each data byte for bits D7. If D7 is 1, reject the data byte; otherwise, store the data bytes at memory locations starting at 2070H. (10 marks)

**(b)(i)** What are the three types of D/A converters? Calculate the values of the LSB, MSB, and full scale output for an 8-bit DAC for the 0 to 10V range.

**(ii)** Calculate the decimal value in the accumulator before and after the Rotate instructions are executed, and explain the mathematical functions performed by the instructions.

MVI A,78H

RRC

RRC

(10 marks)

**4 (a)** Write a program to count from 0 to 20H with a delay of 100ms between each count. After the count 20H, the counter should reset itself and repeat the sequence. Use register pair DE as a delay register. Show your calculations to set up the 100ms delay. (10 marks)

**(b)(i)** Which instructions are used in stack pointer for putting a data and extracting a data?

**(ii)** Write a program to meet the following specifications and specify the stack locations and their contents after execution of the instructions

1) Initialize the stack pointer register at 20FFH.

2) Load register pairs B,D, and H with data 3702H, 4212H, and 8740H, respectively.

3) Call subroutine

4) Push the contents of the register pairs B, D, and H on the stack

5) Pop the contents of the register pairs.

(10 marks)

**5 (a)** Two digit BCD number is stored in memory location 4200H. Unpack the BCD number and store the two digits in memory locations 4300H and 4301H such that memory location 4300H will have lower BCD digit. (10 marks)

**(b)(i)** List four instructions which control the interrupt structure of the 8085 microprocessor.

**(ii)** Write instructions to reset RST 7.5. Assume the RST 5.5 and RST 7.5 are enabled and the interrupt process is disabled. (10 marks)

\*\*\*\*\*END\*\*\*\*\*