2122
B. E. (Computer Science and Engineering)
Third Semester
CS-304: Microprocessors

Time allowed: 3 Hours

Max. Marks: 50

NOTE: *Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Section.*

x-x-x

1. (a) Illustrate the memory address range of chip with 128 bytes of memory. [5 x 2 = 10]

   (b) Draw and explain the timing diagram of instruction:

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   (c) Explain the relationship between counters and time delay.

   (d) Compare RIM and SIM 8085 instructions.

   (e) Write the control word for 8255 PPI to configure Port A: mode 2 Port B: mode 1 output.

SECTION – A

2. (a) Draw and explain 8085 pin diagram in detail. [4]

   (b) Interfacing of 8155 memory segment is as shown below: [2, 2, 2]
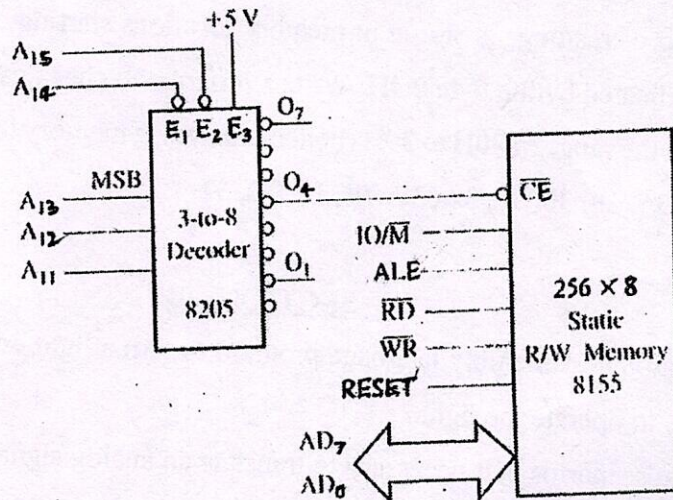
   i. In the SDK-85 system, the specified map of the 8155 memory is 2000H to 20FFH. If you enter a data byte at the location 2100H, will the system accept the data byte? If it accepts it, where will it store the data byte? Explain your answer.

   ii. Specify the memory address range if output line O_1 of the decoder 8205 is connected to the chip enable signal of 8155. Specify the range of foldback memory.

   iii. By examining the range of foldback memory, specify the relationship between the range of foldback memory and the number of don't care lines.

3. (a) The following diagnostic routine can be used to troubleshoot the interfacing circuit of an input port. [1,2,1,1]

Instruction	Bytes	T - states	Machine Cycles		
			M_1	M_2	M_3
START: IN 84H	2	10(4,3,3)			
JMP START	3	10(4,3,3)			

   i. Identify the machine cycles.

   ii. If the system clock is 2 MHz, calculate the time required to execute the routine.

   iii. Specify the number of timed the read ($\overline{RD}$) control signal is asserted if the loop is executed once.

   iv. If the loop is executed continuously, specify the time between two consecutive $IO/\overline{M}$ signals that are high.

   (b) Write an 8085 assembly language program to sort a list of 4 numbers stored in consecutive memory locations, in ascending order. Program should perform in-pace sorting. Explain your program in detail. [5]

4. (a) Write a detailed note on 8085 instructions that can perform logic operations. [5]

   (b) A string of readings is stored in memory locations starting at XX50H, and the end of the string is indicated by the byte 0DH. Write a program to check each byte in the string, and save the bytes in the range of 30H to 39H (both inclusive) in memory locations starting from XX70H.
   Data (H): 35, 2F, 30, 39, 3A, 37, 7F, 31, 0D, 32 [5]

SECTION – B

5. (a) Write an 8085 assembly language program to turn a light on and off every 5 seconds. Use data bit D_7 to operate the light. [4]

   (b) In what scenarios is it necessary to translate an analog signal into a digital signal? What is successive – approximation A/D converter? Further, explain interfacing of an 8-bit A/D converter. [1,1,4]

6. (a) Explain the data transfer during execution of CALL instructions with the help of a table having columns: Machine cycle, SP, AB, (PCH) (PCL), DB, (W) (Z). [3]

   (b) Draw and explain 8255 block diagram in detail. List the necessary steps followed for communication of 8255 with peripherals. Further explain 8255 control word. [3,2,2]

7. (a) Explain in detail Mode 2 and Bit set/reset mode of 8255A programmable peripheral interface. [3, 3]

   (b) Write a detailed note on 8257 DMA controller chip. [4]