Indian Institute of Engineering Science and Technology, Shibpur

B.Tech. (Information Technology) 5th Semester Final Examination 2021

Subject: Microprocessor and Microcontroller (IT 3101)

Time: 90 minutes Full Marks: 50

Answer 5 questions

(90 minutes are allotted for answering the questions and 15 is allotted to scan and upload the answer sheet in the Google classroom)

1. a) Explain Instruction cycle, Fetch cycle, Execute cycle.
   b) Explain with the diagram the demultiplexing scheme of the Bus AD_7-AD_0 in 8085.
   c) Discuss the use of READY pin of the 8085 CPU.
   d) What is the clock cycle time of an 8085 microprocessor working with a crystal of 2MHz frequency ?

   3+3+2+2

2. a) Write the difference between compare and subtract instructions in 8085.
   b) Write a CALL instruction at memory location 8001H to call a subroutine specified at 8050H. Assume that stack pointer is at location 8100H.
   c) The status of the accumulator and carry flag is given as follows
      A =BAH and CY = 0. Find Accumulator contents after execution of 2+3+4+1
      a) RLC instruction
      b) RAL instruction
      c) RRC instruction
      d) RAR
   d) In the operation of XCHG Instruction, which are registers involved?

3 a) Table shows how the contents of each of the registers & the mem. locations varies after execution of each of the specified instructions.

	A	B	C	D	E	H	L	1000	1001	1002	1003	1004
Initial	35	28	41	10	02	25	00	27	25	37	41	56
LDAX D												
XCHG												
MVI M, 56H												
MVI A, 25H												
MOV C, D												

   b) Sixteen bytes of data are stored in memory locations from 8050H to 805FH. Write 8085 assembly code to transfer entire block of data to new memory locations starting at 8070H.

   5+5

4. a) What is Bus Contention?
   b) Compare the advantages and disadvantages of fully decoded memory interface scheme with the partially decoded scheme.
   c) Design a memory system of size 4K bytes using chips of size 2Kx 4 bits.
   d) 8085 has 2 K bytes of ROM and 256 bytes of RAM. It has maximum possible size of 64 K has address range from 0000H to FFFFH. 2K ROM occupies address range 0000 to 07FFH. 256 bytes of RAM occupy address space from 2000H to 20FFH. Draw the memory map. 2+3+3+2

5. a) Differentiate between memory mapped I/O & I/O mapped I/O.
   b) Discuss the operating modes of 8255 programmable peripheral interface.
   c) Write down the format for control word of 8255 PPI chip. 2+4+4

6. a) Explain the concept of segmented memory in 8086?

b) What are its advantages of the segmented memory?
c) How do you generate the Physical address in 8086?
d) Assume that segment register contains 1004H and offset address is 5434. Generate the Physical Address. 4+2+2+2

7. a) What is the difference between the jump and loop instructions?
b) Write a program to add byte 0FH to the data residing in memory location, whose address is computed using DS=3000H and offset=0300H. Store the result of the addition in 0400H.
c) Write a program to find out the largest number from an array of sixteen 8-bit numbers stored sequentially in the memory locations starting at offset 0300H in the segment 3000H. 2+4+4