USN | | | | | | | | | | |

2002 SCHEME **EC45**

Fourth Semester B.E. Degree Examination, June-July 2009
Microprocessors

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions.***

1 a. Sketch a 4 bit x 4 location R/W memory with all possible details and indicate how to
   i) Read the contents of 2nd location and
   ii) Write data '5' into 4th location. **(08 Marks)**

   b. Sketch the interfacing of a CPU with a ROM and write the steps the CPU follows to fetch and execute an instruction from ROM. Sketch the required blocks in CPU. **(10 Marks)**

   c. The different devices interfaced to a CPU are normally Tri-state devices, why? **(02 Marks)**

2 a. Sketch and explain the programming model of 8085. **(05 Marks)**

   b. Explain the functions of status signals and external input pins of 8085 (other than the interrupt and power supply pins). **(07 Marks)**

   c. Give the opcode format of MOV instruction and obtain from that the opcode of MOV A, A. **(04 Marks)**

   d. If initially (DE) = FFFFH, indicate the status of all flags after executing the following instructions: INR D; INX D. **(04 Marks)**

3 a. Explain the different addressing modes available for 8085 data. With an example. **(08 Marks)**

   b. Following program is written to count the number of negative data bytes available among six bytes stored from location 20FEH. Correct the program if it is wrong, without altering the nature and order of instructions. **(08 Marks)**

```
        LXI   B, 0006H
        LXI   H, 20FEH
BACK :  MOV   A, H
        ORA   A
        JM    NEXT
        INX   B
        INR   L
NEXT :  DCR   C
        JNC   BACK
        MOV   M, A
        HLT
```

   c. Explain the Rotate instructions of 8085. **(04 Marks)**

4 a. Sketch the timing diagram for the instruction ADD B. What are the different possible machine cycles of 8085? **(08 Marks)**

   b. Write a program to obtain the 7-segment code for a BCD number stored in location XX20H. The code so obtained should be stored in location XX21H. The 7-segment codes are stored in a memory block starting with the address XX50H for the numbers 0 to 9. **(10 Marks)**

   c. Why the start pointer of 8085 has to be initialized towards the end of R/W memory? **(02 Marks)**

5 a. Interface 8085 to a ROM chip of 4K x 8 bit and RAM chip of 2k x 8 bit. With starting addresses 0000H and 8000H respectively use a 74138 decoder. **(08 Marks)**

   b. Compare the memory mapped I/O with I/O mapped I/O. **(06 Marks)**

   c. Explain the working of the instructions DAA, XTHL and PCHL. **(06 Marks)**

6 a. For INTR and vector interrupts of 8085, indicate
   i) How to generate interrupts over these lines
   ii) What is the response of 8085 if any of these lines are activated and
   iii) How to enable or mask each one of them. **(10 Marks)**

   b. Design a Real time clock using a 50 Hz power line. Display the seconds and minutes on output parts with I/O addresses 40H and 80H. Give the interfacing details with 8085 and the program. **(10 Marks)**

7 a. Explain the Mode-O and BSR modes of 8255 along with he format of forming the control words. Obtain the control words for
   i) Mode-O: Port A, B and port C lower as input ports and port C upper as output port and
   ii) BSR mode to set PC_4. **(08 Marks)**

   b. Interface two push button keys and one 7-segment display digit to 8085. Write a program to display '1' or '2' on the display depending on whether key '1' or '2' is pressed. **(10 Marks)**

   c. What are the advantages of using the display / keyboard interface chip 8279 with 8085? **(02 Marks)**

8 a. i) Explain the features of the timer 8253/8254 with its block schematic diagram.
   ii) Write a program segment, which generates a square wave using 8253. **(10 Marks)**

   b. Explain the Transmitter and Receiver sections operation of 8251. **(05 Marks)**

   c. Explain the features of 8259 and how this can be interfaced to 8085. **(05 Marks)**

* * * * *