

Reg. No. 

## Fourth Semester B.E. Degree Examination, January/February 2006

BM/EC/EE/TE/ML/IT  
Microprocessors

Time: 3 hrs.)

(Max.Marks : 100)

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

1. (a) Which are the microprocessor initiated operations? With a block diagram, explain the 8085 bus organization. (8 Marks)
  - (b) Explain the operation of the following pins of 8085  
i) READY ii) S 1 and S 0 iii)  $IO/\overline{M}$  ii) ALE (8 Marks)
  - (c) Assume that the GO 2000 EXEC command is given in a 8085 microprocessor trainer kit. List the activities that take place in the sequence of their happenings. (4 Marks)
2. (a) What do you mean by addressing modes of data? Explain the four important such modes of 8085 with an example for each one of them. (9 Marks)
  - (b) Following program has been written to pick the largest out of six 8 bit numbers stored in the memory starting with the address 1020H containing 20H, 1AH, 23H, 40H, 48H and 22H in the same order. Indicate the contents of the registers HL, C, A, M and status of CY flag at the end of the execution of the program. (9 Marks)
 

```

LXI H, 1020 H
MVI C, 05H
MOV A, M
INX H
LOOP: CMP M
      JNC NEXT
      MOV A, M
NEXT: DCR C
      JNC LOOP
      HLT
      
```
  - (c) If a 8085 microprocessor system is to have one 2K ROM and one 2K RAM chip, what should be the starting addresses of these chips? (2 Marks)
3. (a) Write an ALP to find the average of six, 8 bit numbers stored from memory location XX20H. Store the average value after the last number in the memory. (10 Marks)
  - (b) i) What are the uses of subroutines?  
ii) Initially if SP=2000H, BC=1234H, HL=5678H, sketch the stack memory contents after the execution of the following program segment indicating the SP value  

```

PUSH H
POP D
PUSH B
      
```

 (6 Marks)
  - (c) Calculate the time required to execute the following program segment with a 8085 CPU connected with a crystal of 2 MHz. (4 Marks)
 

```

MVI D, 04H
BACK: DCR D
      JNZ BACK
      
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4. (a) Sketch and briefly explain the timing diagram of the instruction ADD M. (8 Marks)
- (b) Write an ALP to store the status of the flags S,Z,AC, P and CY as 00H(FFH) if they are reset (set) in five memory locations starting with the address 1020H. (10 Marks)
- (c) i) Which 8085 arithmetic instruction does not affect zero flag?  
ii) What is the value of SP upon reset of 8085? (2 Marks)
5. (a) Interface 2Kx8 bit ROM starting with address 0000H and 4K x 8 bit RAM starting with address 1000H using 2716 and 6116 chips respectively, to 8085. Indicate the address map and use absolute decoding with the help of 74138. Show clearly all the control signals. (10 Marks)
- (b) Interface 8 dip switches and 8 relays to 8085 in memory mapped I/O with addresses FFF8H and FFF9H, respectively. Use 74LS244 and 74LS373 chips. Write a program to switch ON/OFF relays depending on the status of the switches whether they are ON/OFF. (8 Marks)
- (c) If a subroutine is entered using a CALL instruction and returned to main program from subroutine by a jump instruction instead of a RET instruction, what is the disadvantage? (2 Marks)
6. (a) Explain the SIM and RIM instructions of 8085. (6 Marks)
- (b) Explain the sequence of operations that takes place when the interrupt on INTR pin of 8085 is active. (4 Marks)
- (c) Design a 1-minute timer using a 60 Hz power line as an interrupting source for 8085. The two output ports PORT 1 and PORT 2, respectively should display minutes and seconds. (10 Marks)
7. (a) Explain the internal schematic of 8255 chip and its operating modes briefly. (10 Marks)
- (b) Interface a 8255 to 8085 and write an ALP to generate a rectangular waveform with 1 msec ON time and 2 msec OFF time. (10 Marks)
8. Write short note on :
- (a) Demultiplexing scheme of addr/data bus of 8085.
- (b) 8253 timer
- (c) 8279 keyboard/display controller
- (d) D/A conversion with 8085. (5x4=20 Marks)

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