SE418

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S.E. (Electronics & TC / Electronics & Comm Engg) (Sem-IV) (Revised Course 2016-2017)
EXAMINATION Nov/Dec 2019
Microprocessors and Interfacing

[Duration : Three Hours] **[Total Marks : 100]**

Instructions:
1) Assume suitable data **if necessary**
2) Notations have their **usual** meaning

PART - A

Answer **any two** full questions from the following:

Q.1 a) Explain the following signals with respect to 8085. **(6)**
i) ALE ii) IO/$\overline{M}$ iii) TRAP

Q.1 b) With a neat timing diagram, explain the execution of the following instruction in 8085 microprocessor. **(8)**

Memory Address	Instruction	Hex code
F009H	STAX B	02H

Assume BC = F 100H and A= FFH

Q.1 c) The following block of data is stored in the memory locations from 8055H to 805AH. Write instructions to transfer the data to the locations 8080H to 8085H in reverse order. **(6)**
(eg. data byte 22H should be stored at 8085H and 37H at 8080H.)
Data (H) 22, A5, B2, 99, 7F, 37

Q.2 a) Calculate the number of memory chips needed to design 16K – byte of memory if the memory chip size is 2048 x 8 bits. **(4)**

Q.2 b) Identify the addressing mode, number of bytes, type of machine cycle and T- states for each of the following instructions. **(8)**
i) DCR D ii) DAD B iii) LXI H, F100H iv) SUB L

Q.2 c) What is a subroutine? Explain 8085 instructions used to implement subroutines. Hence explain the concept of nesting and multiple- ending subroutines. **(8)**

Q.3 a) Write an 8085 assembly language program (ALP) to find the largest in a series of 10 numbers stored from memory location F100H. **(8)**

Q.3 b) Write an 8085 program to count from 0 to 9 with a 1 – second delay between each count. At the count of 9, the counter should reset itself to zero and repeat the sequence continuously. Display the count at one of the output ports. Assume clock frequency= 1MHz. show the delay calculations. **(12)**

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PART- B

Answer **any two** full questions from the following:

Q.4

a) With the help of neat block diagram explain the typical successive approximation A/D converter as an integrated circuit. Also list the steps to interface an A/D converter with the microprocessor. **(7)**

b) Discuss memory mapped I/O in detail. **(8)**

c) What are software interrupts in 8085? List the different software interrupts and their locations. **(5)**

Q.5

a) Describe the 8255 internal architecture with a block diagram. **(10)**

b) Draw a neat diagram and explain how an 8259 is interfaced with 8085. **(5)**

c) Write a short note on serial communication supported by 8085. **(5)**

Q.6

a) Write the initialization instructions for the 8259 interrupt controller to meet the following specifications. **(10)**

i) edge triggered, single and ICW4 are not needed.

ii) mask interrupts IR_1 and IR_3.

iii) interrupt vector address for IR_0 is 6280H

iv) call address intervals are four bytes.

b) Write a subroutine to transmit an ASCII character stored in Reg. C using SOD line as a 1- bit output port. **(5)**

c) Draw the format of SIM instruction of 8085 and explain its bit pattern. **(5)**

PART- C

Answer **any one** full questions from the following:

Q.7

a) Write an 8085 program to subtract one packed BCD number from another BCD number. The minuend is placed in B, and the subtrahend in C. Place the result in A. **(10)**

b) Specify the number of times the following loops are executed. **(6)**

i)
```
LXI B, 1000H
LOOP : DCX  B
       NOP
       JNZ LOOP
```

ii)
```
MVI A, 17 H
LOOP: RAL
      ORA A
      JNC LOOP
```

c) Register BC = 2793H and DE= 3182 H. Write instructions to add these two 16 – bit numbers and place the sum in memory locations 2050H and 2051H. **(4)**

Q.8

a) Write a program to blink Port C, bit 0 of an 8255. Assume address of control word register of the 8255 as 83H. Use Bit Set/Reset mode. **(7)**

b) Explain in detail the RST instruction. Also draw the circuit diagram to implement RST 56. **(6)**

c) Write a program to enable all the interrupts in 8085 system. **(4)**

d) Calculate the values of LSB, MSB and full scale output for an 8 bit DAC for 0 to 10 V range. **(3)**