

Exam.Code:0915
Sub. Code: 6779

1078
B.E. (Computer Science and Engineering)
Third Semester
CS-304: Microprocessor

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Section.

x-x-x

Q1.

- Draw the schematic diagram to generate the four control signals related to read and write operations of 8085. (2)
- Briefly explain the following instructions of 8085 indicating their addressing modes, flags affected, number and name of machine cycles in execution of each: XRA A, SUB M, DCX SP, ADC M. (2)
- Draw the timing diagram for instruction INR M of 8085 microprocessor. (2)
- If CALL and RET instructions were not there in assembly language of 8085, will it be possible to write subroutine for 8085? If Yes, how? (2)
- Calculate the count to be loaded in B register for a given instruction to obtain a delay of 100 microseconds and express the value in hex. Consider the clock frequency of 3MHz. (2)

```

                                MVI B, Count
LOOP :                          NOP
                                NOP
                                DCR B
                                JNZ LOOP

```

Section-A

Q2.

- Compare memory mapped I/O with I/O mapped I/O. (3)
- Suppose 4K RAM and 4K ROM needs to be interfaced with 8085. Chips available are of size 512 X 4 bits for RAM and 256 X 8 bits for ROM. Show the schematic interfacing diagram for RAM and ROM along with the memory address map. (4)
- Write an assembly language program to convert 16-bit binary number to BCD. (3)

Q3.

- Discuss instruction cycle, machine cycle and T-state in conjunction with 8085 microprocessor (3)
- Write a program to search a byte stored at location Y from a set of 8-bit numbers stored from location X. X stores the total number of 8-bit numbers and numbers are stored from X+1 location onwards. If the byte is found store the address of the memory location at Y+1 and Y+2. (4)
- Draw and explain the timing diagram for instruction LDAX B of 8085. (3)

Q4.

-2-

- a) Write a program to check a byte stored at X belongs to "2 out of 5" code or not. It is a valid code if the MS 3 bits are 0's and there are two 1's in LS 5 bits. Put FFH in X+1 if it is a 2 out of 5 code else 00H. (5)
- b) How many flags are there in 8085? Explain. (2)
- c) Write an assembly language program that takes data from memory location X and sets to 1 the MS 2 bits, complements the 4 bits in the middle of this byte and resets to 0 the LS 2 bits, stores the result at memory location Y. (3)

SECTION-B

Q5.

- a) With a neat diagram the data transfer from port B of 8255 PPI to 8085 in interrupt driven mode. (4)
- b) Assume that ISR (Interrupt Service Routine) for interrupt TRAP is stored at memory beginning at 2060 H. Explain the sequence of steps must occur for this ISR to be activated. (3)
- c) RST 6.5 of 8085 microprocessor is unmasked and interrupts are enabled. If the microprocessor receives a high input on RST 6.5 which remains high for 50 microseconds and 8085 services the interrupt in 10 microseconds, what is going to happen? While the processor is executing RST 6.5 service RST 7.5 occurs, what will CPU do? Why? (3)

Q6.

- a) Describe the interfacing of analog to digital connector using 8255 PPI with 8085 microprocessor. (3)
- b) Write a program and subroutine to perform $a!+b!$, store the result at location 3500H. (5)
- c) Discuss the PUSH and POP instructions in 8085. (2)

Q7.

- a) Write a short note on 8259 Programmable Interrupt Controller (5)
- b) Write a program to simulate a stopwatch to display minutes and seconds. There should be a provision to stop the stopwatch with the display continuing to show the time just before the stop command. Use RST 7.5 to interrupt the stopwatch. (5)