15181

B. Tech 5th Semester Examination

Microprocessor Theory & Applications (NS)

EC-311

Time : 3 Hours   **Max. Marks : 100**

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt five questions in all. Selecting at-least one question from Sections A, B, C and D. Question No. 9 of Section E is compulsory.

SECTION - A

1. (a) Explain the architecture of 8085 with the help of a block diagram.   (10)

    (b) (i) What is the function of following signals of 8085?

         IO/$\overline{\text{M}}$, INTR, ALE, S1 and S2.   (5)

         (ii) What is the importance of address bus and control bus?   (5)

2. (a) What are the addressing modes of following instructions. Explain your answer:-

         STC; MOV A, M; LHLD 2000; STAX H and LXIH 2100.
                                                          (10)

    (b) Draw and explain timing diagrams of opcode fetch and memory write operations.   (10)

SECTION - B

3. (a) Write an assembly language program to add two 8 bit BCD numbers to get 16 bit BCD sum.   (10)

    (b) What will be the status of Carry flag, Zero flag and Parity Flag after the execution of each instruction in the following code. (Initially all flags are reset=0)

         XRA A

         CMA

         INR A

         CMC

         SUB A   (10)

4. (a) Explain different IO mapping techniques with their merits and demerits.   (10)

    (b) What are vectored interrupts? Explain enabling, disabling and masking of interrupts. How can data be transferred by using interrupts?   (10)

SECTION - C

5. (a) What is DMA? Explain different DMA Modes.   (10)

    (b) Differentiate between synchronous and asynchronous data transfer. How synchronous and asynchronous data can be transferred using 8251?   (10)

6. (a) Draw and explain the architectural block diagram of 8279 or 8259.   (10)

    (b) Explain the interfacing between 8085 and 8257 DMA Controller.   (10)

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SECTION - D

7. Draw and explain the basic maximum and minimum mode configuration of 8086 microprocessor. Show the address latches, transceivers, clock generators required for the system design.   (20)

8. (a) (i) A memory device has 20 address lines. What can be the maximum capacity of the memory device if 16 bits are stored at one memory location?   (5)

    (ii) What is the use of address decoders in a microcomputer?   (5)

    (b) Explain the various status flags of 8086.   (10)

SECTION - E

9. (a) Is microprocessor data saved in stack while acknowledging DMA request? Justify your answer.

    (b) Explain following 8085 instructions: MOV A, M and LDAX D.

    (c) What will be the status of zero and carry flag after the execution of following instructions:-
    MVI A, 00
    DCR A

    (d) What is the use of SID and SOD lines of 8085?

    (e) What is the difference between 8086 and 8088?

    (f) Why is it necessary at the start of an interrupt service procedure to PUSH all registers used in the procedure and to POP them at the end of the procedure?

    (g) List out some modern microprocessors.

    (h) Differentiate between assembly language and machine language.

    (i) What is the use of prefetch queue in microprocessors?

    (j) Explain TRAP and NMI.   (2×10=20)