[Total No. of Questions - 9] [Total No. of Printed Pages - 3]
(2123)

1406

B. Tech 5th Semester Examination

Microprocessor Theory and Applications (O.S.)

EC (ID)-5001

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, by selecting at least one question from Sections A, B, C and D. Question number - IX of Section E is compulsory. All questions carry equal marks.

SECTION - A

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

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

   HOLD, INTR, IO/$\overline{M}$, XI and X2.

   (ii) What is the importance of address bus and control bus? **(20)**

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

   LXI B, 2000; CMA; SHLD 4000; LDAX D and INX H.

   (b) Draw and explain timing diagrams of opcode fetch and memory write operations. **(20)**

SECTION - B

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

   (b) Write an assembly language program to find smallest number in a data array. **(20)**

4. (a) Explain following 8085 instructions:- XCHG, PUSH PSW, RRC, PCHL and DAD H.

   (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
   INR  A
   ADI  FF
   CMC
   CMA
   ```

   (20)

SECTION - C

5. (a) Explain vectored interrupt? Explain enabling, disabling and masking of interrupts. How can data be transferred by using interrupts?

   (b) (i) Differentiate between edge triggered and level triggered interrupts.

   (ii) What is the need of both RAM and ROM in a microprocessor based system? **(20)**

6. (a) What is the need of DMA? Explain different DMA schemes.

   (b) Write a note on DMA controllers and their interfacing with CPU. **(20)**

SECTION - D

7. Explain 8279 (Programmable Keyboard/Display Interface) and 8253 (Programmable Interval Timer) with the help of functional block diagrams. **(20)**

8. Explain with the help of a neat functional block diagram, how square wave is generated and how its parameters can be changed? **(20)**

SECTION - E

9. (a) List 16 - bit registers of 8085 microprocessor.

   (b) What is the advantage of using microprocessor registers for temporary data storage over using a memory locations?

   (c) What determines whether a microprocessor is considered as 8-bit or 16-bit?

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

   (e) Explain memory mapped 10.

   (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) What is the use of RIM and SIM instructions in 8085?

   (h) Differentiate between INR B and INX B.

   (i) What is the difference between assembly language and machine language?

   (j) What is the need of wait state? **(10×2=20)**