Printed Pages : 4 TEC-503

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 3087 Roll No.

B. Tech.

(SEM. V) EXAMINATION, 2008-09

MICROPROCESSORS AND APPLICATIONS

Time : 3 Hours] *[Total Marks : 100*

Note : *(1) Answer* ***all*** *questions. All questions carry* ***equal*** *marks.*

(2) Choices are internal to each question.

(3) Answers must be to the point.

(4) Assume missing information and or data if ***necessary.***

1 Answer any **two** parts :

(a) You want to attach 1 kB ROM with address 0000H-03FFH and 4 kB static RAM with address 2000H-2FFFH in a 8085 based system. You have sufficient supplies of 1 kB ROM chips and 1 kB RAM chips. Each of these memory chips have requisite number of address pins, one chip select ($\overline{CS}$) pin, 8 data pins, two power supply pins and a $\overline{RD}$ pin. Apart from these the RAM chips also have a $\overline{WR}$ pin. Show the connection diagram of the memory bank with justification. You may use as many decoder and gate chips as you require. **10**

(b) With a neat diagram describe the internal architecture of 8085. State the function of each block shown. **10**

(c) With reference to 8085, show the timing diagram for the instruction ADD B. The diagram must show both the 'Fetch' and 'Execution' parts clearly demarcated. The instruction sheet shows 4 T-states against this instruction. Does your timing diagram conform to this view ? If the memory is not 'Ready' where in the timing diagram the 'Wait State(s)' are inserted ? **10**

2 Answer any **two** parts :

(a) Ten integers of 1-word length are stored consecutively in the memory beginning from a given address (Choose any arbitrary value for the address). Write a program for 8086 to rearrange the integers so that the largest is now stored at the highest location address. Put meaningful comments to your program so that the logic/ algorithm behind your program is clear. **10**

(b) With examples explain the addressing modes available in the instruction set of 8086. **10**

(c) Give very short answers to the following : **5×2**

(i) How much memory can be attached to 8086 ? - Justify.

(ii) Apart from memory how many I/O devices may be accessed by 8088 ?

(iii) Contents of which register is modified in execution of 'Far Jump' but not 'Near Jump' ?

(iv) If you compare the execution of a 'Call' and a 'Jump' instruction, is there any difference in changing the contents of any memory location ?

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

3 Answer any **two** parts :

(a) Explain the keyboard scanning technique of 8279. How many keys can be attached to it ? How many simulfaneous depression keys (like 'Shift', 'Alt', 'Ctrl' etc.) does it support ? Explain your opinion. **10**

(b) Explain the facilities available in 8259. What is its main application area ? Explain the fixed and rotating priority properly. How does 8259 identify its own status as master or slave ? How does it identify its own number while on job ? **10**

(c) Explain with a neat diagram the operation and programming of 8255. Where in a PC you may find it ? **10**

4 Answer any **two** parts :

(a) An 8-bit ADC starts converting when a 'high' pulse is obtained through its 'SC' pin. When it completes its conversion, it makes available the digital value through its 8 data pins and indicates the event by a 'low' signal through its '$\overline{\text{EOC}}$' pin. You want to interface this to an 8086 board through an 8255. **10**
Draw a schematic diagram and write a supporting program for the interface.

(b) Explain the following terms with respect to an ADC : (i) Accuracy (ii) Resolution and (iii) Conversion time. 3

List the different types of ADC you know about. 2

Which of them need a built-in DAC ? Write a short note on methods of Digital to Analog conversion. 5

(c) What is the maximum clock frequency that can be input to an 8253 A timer ? Can you program an 8253 A so that gives a short high pulse at a regular interval of 10 mS ? Explain with a neat diagram your method. How you program your 8253 A ? Can you suggest any application in this entire question paper that may need such type of pulse generation ? 10

5 Answer any **two** parts : 2×5

(a) Write short notes on :

(i) 8051 memory organization

(ii) 8051 bit manipulation instructions.

(b) Write a short note on Pentium processor. 10

(c) Compare the advantages and disadvantages of RISC and CISC. How their design concept and architecture differ ? Give examples. 10