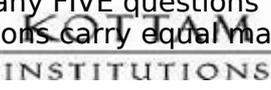III B.Tech. I Semester(R07) Regular Examinations, December 2009
MICROPROCESSORS AND INTERFACING
(Common to Computer Science & Engineering, Information Technology and Electronics &
Computer Engineering)

Time: 3 hours
Max Marks: 80

Answer any FIVE questions
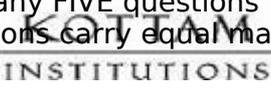All questions carry equal marks

INSTITUTIONS

1. (a) Explain in detail various addressing modes used in 8086 microprocessor with examples.

   (b) Compare the flag registers of 8086 & 8085.

2. (a) Write a program to find the smallest and biggest numbers in a given array.

   (b) Explain with simple examples how the string manipulation instructions in 8086 are useful in block transfer of data.

3. What do you mean by a DMA data transfer? Explain the implementation in 8086 system using 8257 DMA controller.

4. (a) Interface the stepper motor with 8255 and write an ALP to rotate the stepper motor continuously in clock wise direction.

   (b) Write an ALP in 8086 to generate a symmetrical square wave form with 1KHz frequency. Give the necessary circuit setup with a DAC.

5. (a) Differentiate between initialization command words and operation command words of 8259.

   (b) Describe the response of 8086 to the interrupt coming on INTR pin.

6. (a) List out the features of 8251.

   (b) Draw the flowchart showing how synchronous serial data can be sent from a postline using software routine.

7. (a) Give a note on 80286.

   (b) Explain Real and Protected mode segmentation.

8. (a) Discuss about various addressing modes of 8051.

   (b) Draw the external memory (RAM & EPROM) interface with 8051. Explain in detail, how the external memory is accessed with neat timing diagrams.

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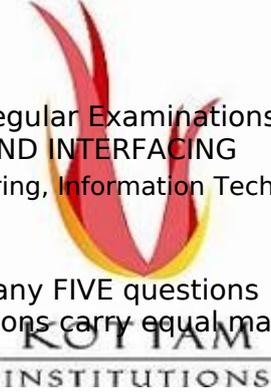All questions carry equal marks

1. (a) Explain the functions of different registers in 8086. Also discuss the flag register contents.

   (b) Draw the internal architecture of 8085? Explain about each block in detail.

2. (a) What is a recursive procedure? Write a recursive procedure to calculate the factorial of number N, where N is a two-digit Hex number.

   (b) What are the loop instructions of 8086? Explain the use of DF flag in the execution of string instructions.

3. (a) Explain the need of DMA. Discuss in detail about DMA data transfer method.

   (b) With a neat timing diagram explain how a READ operation is performed by 8086.

4. (a) Interface a typical 12-bit DAC with 8255 and write a program to generate a triangular waveform of period 10ms. The CPU runs at 5MHz clock frequency.

   (b) Distinguish between Mode Set Control word and BSR control word of 8255.

5. (a) What is the interrupt vector table? Draw and explain the interrupt vector table for 8086.

   (b) Discuss about the following control word formats of 8259.

        i. Initialization Command Words (ICWS).
       ii. Operational Command Words (OCWS).

6. (a) Explain the line driver and the line receiver circuits of serial communication.

   (b) What do you mean by I/O mapped I/O? Draw the interfacing of 8251 with 8086 in I/O mapped I/O mode.

7. (a) Explain the salient features of Pentium.

   (b) What are the characteristics of RISC processors?

8. (a) Explain the interrupt structure of 8051? Mention the priority. Explain how least priority is made as highest priority.

   (b) Interface data memory of 16K × 8 SRAM to 8051 and give memory map. The starting address of SRAM should be 0000H.

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1. (a) With a neat architectural diagram, explain the functioning of an 8086 microprocessor.

   (b) Explain the function of OPCODE prefetch FIFO Buffer in 8086.

2. (a) Write a program to check whether the given string is palindrome or not.

   (b) Briefly explain about following instructions:

      i. ADD.
      ii. NEG.
      iii. AAM.
      iv. DIV.

3. (a) With a neat pin diagram explain the minimum mode operation of 8086.

   (b) Draw a block diagram to interface two 16K × 8 SRAM to the 16-bit data bus of 8086
       based system. Design the address decoder for the address range from 00000H-07FFFH for
       both the SRAMs.

4. (a) What is meant by Interfacing? Explain in brief PPI chip.

   (b) What is BSR mode of operation? How is it useful in controlling the interrupt initiated
       data transfer for mode1 and mode2

5. (a) What are the advantages of 8259?

   (b) Draw and explain the interfacing of cascaded 8259s with 8086.

6. (a) Write the sequence of instructions required to initialize 8251 at address A0H and A1H for
       the configuration below.

      i. Character length-8 bits.
      ii. No parity.
      iii. Stop bits-1 $1\frac{1}{2}$.
      iv.
      v. Band rate-16X.
      vi. DTR and RTS asserted.
         Error flag reset.

   (b) Discuss the serial data transmission standards and their specifications.

7. Explain the salient features of:

   (a) 80386 and

   (b) Pentium.

8. (a) What are the advantages of Microcontroller Based Systems over Microprocessor Based
       Systems?

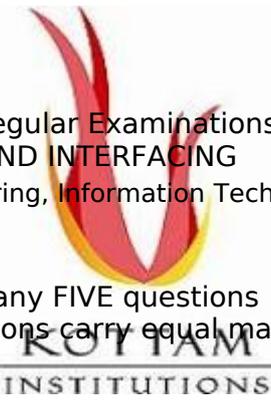   (b) With a neat sketch discuss the internal architecture of 8051.

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1. 8086 processor do not provide memory indirect addressing mode. Show all possible ways to access a word from memory where the segment address is given in location 2000H:1000H and the offset is given in location 2000H:1002H .Give the instruction sequence for every addressing mode of 8086.

2. (a) Write a program to sort an array in descending order.

   (b) Write an ALP in 8086 to exchange a block of N bytes of data between source and destination.

3. (a) With a neat block diagram, explain the working of 8251 DMA controller.

   (b) Explain how static RAMs are interfaced to 8086. Give necessary interface diagram assuming appropriate signals and memory size.

4. (a) Draw and explain the interfacing of ADC-0809 with 8086 microprocessors using 8255.

   (b) Write an assembly language program to rotate a 200 teeth, 4 phase stepper motor as specified below. Ten rotations clockwise and eight rotations anticlockwise.

5. (a) What interrupt type is associated with NMI? Mention the vector address.

   (b) What is the purpose of operational command words of 8259? Explain these format and the use.

6. (a) Draw the block diagram of 8251 and explain each block.

   (b) Describe the asynchronous transmission and reception schemes in detail.

7. (a) Explain the salient features of 80386.

   (b) Mention the characteristics of RISC processors.

8. (a) Explain the support given in 8051 instruction set to handle bit addressable RAM.

   (b) 8051 uses 11.0592 MHz crystal. To get 9600 band rate, how will you program it for serial transmission.