

III B.Tech I Semester Regular Examinations, November 2006
MICROPROCESSORS AND INTERFACING
(Production Engineering)

Time: 3 hours**Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. (a) What is a Microprocessor?
(b) Explain in detail the pin diagram of 8085 Microprocessor. [6+10]
2. (a) Draw and explain the pin out diagram of 8086.
(b) Explain the various operations performed by Bus Interfacing unit in 8086. [10+6]
3. (a) Explain the following Instructions.
 - i. MOV
 - ii. POP
 - iii. XCHG
 - iv. SAHF(b) Write a program to convert a Binary Number to a BCD Number. [8+8]
4. A set of code is reused several times with a separate stack in a program. The remainder of the program uses another stack segment. Define a macro with the necessary instructions at the beginning and end of this set of code in order to switch stacks and then switch back again. Also give the necessary code to define the two stacks and initially set SS and SP? [16]
5. (a) Write an instruction sequence that converts unpacked BCD digits to seven-segment code using a conversion table. Assume the necessary data.
(b) Explain string instructions supported by 8086 processor? [8+8]
6. It is necessary to serve 15 interrupt requests using 8259's. The address map for the 8259's is given from 0100H to 0103H. Show the complete interface with 8086 system bus? These 15 interrupts are to be requested from interrupt type 060H on words, with level triggered mode and auto end of interrupt. Give the initialization sequence for all 8259's. [16]
7. Interface an 8-bit DAC to 8255 with an address map of 0100H to 0103H. The DAC provides output in the range of +5V to -5V. Write the instruction sequence for the following?
 - (a) For generating a square wave with a peak to peak voltage of 2V and the frequency will be selected from memory location 'FREQ'.
 - (b) For generating a triangular wave with a maximum voltage of +4V and a minimum of -2V. [8+8]

8. (a) Explain demand transfer mode and block transfer mode of 8237?
(b) Show how 8237s are cascaded to provide more number of DRQ's and explain the operation?
(c) Explain how memory to memory transfer is performed with 8237? [6+5+5]

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(b) Explain the various operations performed by Bus Interfacing unit in 8086. [10+6]
3. (a) Explain the following Instructions.
 - i. LDS
 - ii. PUSHF
 - iii. XLAT
 - iv. XCHG(b) Write a program to convert a BCD Number to a Binary Number. [8+8]
4. (a) Write a procedure COMPUTE for performing the computation $R \leftarrow X + Y - 3$ The word variables X, Y, R and COMPUTE are in the same code segment. The variables X and Y are defined in data segment D1_SEG. The data segment D2_SEG contains the variable R. Show the necessary definition along with the procedure?
(b) Give the definition of a macro RESTORE that will pop the register contents that have been pushed in the order AX, BX, CX, DX, SI and DI? [8+8]
5. (a) Explain string instructions supported by 8086 processor?
(b) Give the instruction sequence that compares the first 10 bytes beginning at STRG_1 with the first ten bytes beginning at STRG_2 and branches to MATCH if they are equal, otherwise continues in sequence? [8+8]
6. It is necessary to serve 18 interrupt requests using 8259's. The address map for the 8259's is given from 0A00H to 0A0FH. Show the complete interface with 8086 system bus? These 18 interrupts are to be requested from interrupt type 040H on words, with edge triggered mode and auto end of interrupt. Give the initialization sequence for all 8259's. [16]
7. Interface an 8-bit DAC to 8255 with an address map of 0100H to 0103H. The DAC provides output in the range of +5V to -5V. Write the instruction sequence for the following?

- (a) For generating a square wave with a peak to peak voltage of 2V and the frequency will be selected from memory location 'FREQ'.
 - (b) For generating a triangular wave with a maximum voltage of +4V and a minimum of -2V. [8+8]
8. Interface 8251 with 8086 at address 40H. Initialize it in asynchronous transmit mode, with 7 bit character size, baud rate factor 16, one start bit, one stop bit, even parity enable. Further transmit a message "BEST OF LUCK" in ASCII from to a modem? [16]

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1. (a) What is a Microprocessor?
(b) Explain in detail the pin diagram of 8085 Microprocessor. [6+10]
2. (a) Explain the different types of addressing modes used for indicating branch addresses in 8086.
(b) Develop the machine code for the following
 - i. MOV BX, 2000
 - ii. MOV AX, [6000]
 - iii. MOV CX, DX Take 6 bit code for MOV = 100010 [8+3+3+2]
3. (a) Write a program to sort a given array in descending order.
(b) Write short notes on the following.
 - i. SAR
 - ii. JNAE
 - iii. MUL
 - iv. LAHF [8+8]
4. (a) Discuss the difference between intra segment and inter segment procedures? Explain the return procedure in the above cases? Give the sequence of statements for defining the above procedures and return methods?
(b) Give the sequence of instructions that pushes the offsets of word variables X, Y and Z in data segment onto stack? [8+8]
5. (a) Write an assembly language program that will examine an ASCII string of 100 characters and replace each decimal digit by a %. The character string starts at STRG.
(b) Explain the prefix instruction format of 8086 processor? Discuss how these instructions are useful in string manipulation? [8+8]
6. (a) Give the machine language code for each of the following instructions?
 - i. IN AL, 52H
 - ii. OUT 0CH, AL
 - iii. OUT DX, AX
 - iv. IN AX, DX [2+2+2+2]

- (b) Give the priority of 8086 interrupts, hardware and software? Explain why single step interrupt is having lower priority? [8]
7. (a) What is BSR mode operation? How it is useful in controlling the interrupt initiated data transfer for mode 1 and 2?
- (b) Explain the transistor buffer circuit used to drive 7-segment LEDs? [8+8]
8. (a) Explain demand transfer mode and block transfer mode of 8237?
- (b) Show how 8237s are cascaded to provide more number of DRQ's and explain the operation?
- (c) Explain how memory to memory transfer is performed with 8237? [6+5+5]

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1. (a) List out the various addressing modes used in 8085 Microprocessor.
(b) Explain the following pins of 8085 Microprocessor
 - i. SID, SOD
 - ii. ALE
 - iii. HOLD, HLDA
 - iv. TRAP[8+8]
2. (a) Draw and explain the pin out diagram of 8086.
(b) Explain the various operations performed by Bus Interfacing unit in 8086.[10+6]
3. (a) Explain the following Instructions.
 - i. PUSH
 - ii. XLAT
 - iii. LEA
 - iv. LAHF(b) Write a program to sort a given array in Ascending order. [8+8]
4. (a) Write the sequence of statements that declare the word named 'NWORD' and FAR label 'EXTMOD' as being external and the variable 'IWORD' and the label 'LOCMOD' as being local and accessible by other source modules?
(b) Give the sequence of instructions that pushes the offsets of word variables X, Y and Z in data segment onto stack? [8+8]
5. (a) Write an instruction sequence that converts 4-digit ASCII coded decimal number into ASCII coded hex equivalent number?
(b) Explain string instructions supported by 8086 processor? [8+8]
6. It is necessary to serve 15 interrupt requests using 8259's. The address map for the 8259's is given from 0100H to 0103H. Show the complete interface with 8086 system bus? These 15 interrupts are to be requested from interrupt type 060H on words, with level triggered mode and auto end of interrupt. Give the initialization sequence for all 8259's. [16]
7. It is necessary to initialize interrupt for mode 2 operation of port-A and mode 1 operation of port-B with the 8255 address map of 0800H to 0803H. Give the

complete hard ware design to interface 8255 to 8086 processor with this address map? Write the instruction sequence for the initialization of 8255 in the above modes? Give the instruction sequence to change the operation modes of port A and Port B to mode 1? [16]

8. (a) Explain demand transfer mode and block transfer mode of 8237?
(b) Show how 8237s are cascaded to provide more number of DRQ's and explain the operation?
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