

**III B.Tech. II Semester Regular Examinations, April/May -2005**  
**MICROPROCESSORS**  
**(Mechatronics)**

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

**Answer any FIVE Questions**  
**All Questions carry equal marks**

★ ★ ★ ★ ★

1. (a) Explain in detail the various addressing modes used in 8085 Microprocessor with examples.  
 (b) Explain the following pins of 8085 Microprocessor.
  - i. ADO-AD 7
  - ii.  $IO/\overline{M}$
  - iii.  $S_0, S_1$
  - iv. INTR
2. (a) Explain the flag register of 8086.  
 (b) Explain the concept of memory segmentation.  
 (c) Explain, when Queue is failing to speed up the execution.
3. (a) Explain the following instructions with examples
  - i. XLAT
  - ii. MUL
  - iii. TEST
  - iv. SHL
 (b) Write a program to convert a BCD number to an equivalent Binary number.
4. Write a recursive routine to evaluate the following polynomial  $Y = A_0 + A_1X + A_2X^2 + A_3X^3 + \dots + A_NX^N$ . The coefficients  $A_0, A_1, A_2, \dots, A_N$  are to be successive words in memory and all parameter addresses are to be passed via the stack.
5. (a) Explain the following instructions and the flags that are affected by these instructions
  - i. SCAS DST
  - ii. STOS DST
  - iii. MOVSW
  - iv. CMPSB
 (b) With a 5-MHZ clock estimate the time needed to execute the following instruction sequence.

```
MOV    SI, OFFSET  STG_1
MOV    DI, OFFSET  STG_2
MOV    CX, 0010H
```

```
MOVE:MOV    AL, [SI]
           MOV    [DI], AL
           INC    SI
           INC    DI
           LOOP   MOVE
```

6. The I/O circuitry in an 8086 based system consists of five I/O devices with one status signal for each device. Design the required hardware providing two address locations to each device, one for status and other for data. In the range 0F00H to 0FOFH. Write an instruction sequence to test the status of each device and store it.
7. Explain why 8255 ports are divided into two groups? Discuss how these groups are controlled in different modes of operation? Explain different control signals and their associated pins for bi-directional I/O mode of operation?
8. (a) How do we connect RS-232C equipment
  - i. To data terminal type devices?
  - ii. To serial port of SDK 86, RS-232C connection?(b) Draw the block diagram of 8272 floppy disk controller and explain each block?

\*\*\*\*\*

**III B.Tech. II Semester Regular Examinations, April/May -2005**  
**MICROPROCESSORS**  
**(Mechatronics)**

Time: 3 hours

Max Marks: 80

**Answer any FIVE Questions**  
**All Questions carry equal marks**

★ ★ ★ ★ ★

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
  
2. (a) Explain :
  - i. Immediate operand to register and
  - ii. Immediate operand to memory with 16 bit displacement instruction formats with examples.
 (b) Explain the timing diagram for a read cycle of 8086.
  
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.
  
4. (a) Explain with example the necessity of linker in modular programming?  
 (b) Explain how inter-segment CALL and intra-segment CALL instructions are executed? Clearly mention the changes in stack during the execution of above instructions?  
 (c) Discuss the five types of interrupts and their use?
  
5. A logic network is having input variables A,B,C,D. The output variables are given
 
$$W = \overline{A}.\overline{BC} + ABC + \overline{AD}$$

$$X = AC + BA + AD$$
 below.
 
$$Y = \overline{A}.\overline{B} + \overline{A}.\overline{C} + D.\overline{B}$$

$$Z = ABC + ACD + \overline{A}.\overline{BC}$$

The array INPUT\_1 contains 10 different combinations of input variables. Write an instruction sequence that determine the outputs for each combination of INPUT\_1 array and store the output variables in the string OUTPUT\_1.

6. (a) Show the circuit required to generate the upper and lower I/O strobes in minimum and maximum modes of 8086?  
(b) What is the minimum no. of bus cycles that can occur between the time an interrupt request is recognized and the first instruction in the interrupt service routine is fetched. Show the interrupt acknowledge cycle with a flow chart?
7. What is the difference between simple I/O, strobed I/O and bi-directional I/O with reference to 8255? Discuss the required control signals and their timing sequence for each mode of operation?
8. (a) A terminal is transmitting asynchronous serial data at 1200 bd. What is the bit time? Assuming 8 data bits, a parity bit and 1 stop bit how long does it take to transmit one character?  
(b) Draw necessary circuit to interface 8251 to an 8086 based system with an address 0C0H. Write the sequence of instructions to initialize 8251 for synchronous transmission? (Assume the necessary data)

\*\*\*\*\*

**III B.Tech. II Semester Regular Examinations, April/May -2005**  
**MICROPROCESSORS**  
**(Mechatronics)**

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

**Answer any FIVE Questions**  
**All Questions carry equal marks**

\*\*\*\*\*

1. (a) Draw the block diagram of 8085 Microprocessor.  
(b) Explain various interrupt pins of 8085 Microprocessor, and also write their priority.
2. (a) Explain :
  - i. Immediate operand to register and
  - ii. Immediate operand to memory with 16 bit displacement instruction formats with examples.(b) Explain the timing diagram for a read cycle of 8086.
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.
4. (a) Define a macro for moving an arbitrary character string that ends with an EOT character from one string of bytes in memory to another?  
(b) 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?
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?
6. The I/O circuitry in an 8086 based system consists of five I/O devices with one status signal for each device. Design the required hardware providing two address locations to each device, one for status and other for data. In the range 0F00H to 0F0FH. Write an instruction sequence to test the status of each device and store it.
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. (a) Distinguish between synchronous and asynchronous serial data transmission techniques? Discuss the advantages and disadvantages?
- (b) Draw the block diagram of combination of FAX and Data Modem? Explain each block?

\*\*\*\*\*

**III B.Tech. II Semester Regular Examinations, April/May -2005**  
**MICROPROCESSORS**  
**(Mechatronics)**

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions  
All Questions carry equal marks

\*\*\*\*\*

1. (a) Explain various interrupt of 8085 Microprocessor and their priorities.  
(b) Explain the
  - i. SID
  - ii. SOD
  - iii.  $S_0, S_1$ ,
  - iv.  $\overline{INTA}$  pins of 8085 Microprocessor
2. (a) Explain the flag register of 8086.  
(b) Explain the concept of memory segmentation.  
(c) Explain, when Queue is failing to speed up the execution.
3. (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
4. (a) Explain with example the necessity of linker in modular programming?  
(b) Explain how inter-segment CALL and intra-segment CALL instructions are executed? Clearly mention the changes in stack during the execution of above instructions?  
(c) Discuss the five types of interrupts and their use?
5. (a) Explain the prefix instruction format of 8086 processor? Discuss how these instructions are useful in string manipulation?  
(b) Evaluate the result after each instruction for the following sequence.

```
MOV    BX, 006h
MOX    AX, 00H
MOV    CX, BX
REP    ADD  AX, BX
MOV    CX, BX
REP    ADD  AX, AX
```

6. (a) Write an instruction sequence that will cause the priority of an 8259, whose even address is 0200H, to be  $IR_5, IR_6, IR_7, IR_0, IR_1, IR_2, IR_3, IR_4$ . Solve this problem when the current priority is  $IR_3$  and for the second time assuming the current priority to be  $IR_6$ ?
- (b) Under what conditions type 0 interrupt is initiated? List out the instructions that may cause type 0 interrupt?
7. Explain why 8255 ports are divided into two groups? Discuss how these groups are controlled in different modes of operation? Explain different control signals and their associated pins for bi-directional I/O mode of operation?
8. (a) Explain demand transfer mode and block transfer mode of 8237?
- (b) Show how 8237s are cascaded to provide more number of DRQs and explain the operation?
- (c) Explain how memory to memory transfer is performed with 8237?

★ ★ ★ ★ ★