

III B.Tech II Semester Regular Examinations, Apr/May 2008
MICROPROCESSORS AND MICRO CONTROLLERS
(Electrical & Electronic Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Discuss the minimum mode memory control signals of 8086?
(b) Explain the write cycle operation of the microprocessor with a neat timing diagram in maximum mode. [8+8]
2. (a) Write short notes on Linker?
(b) Write an ALP to find the largest among a given array of 16 bit numbers? (choose the length of the array as 100) [6+10]
3. (a) Explain the steps involved in the Interfacing of an I/O device
(b) Explain various methods of interfacing of I/O devices. [6+8]
4. (a) Explain the bus structure of 8086 system
(b) Explain the differences between memory and I/O interfacing. [8+8]
5. (a) Write an 8086 instruction sequence for transmitting 50 characters which are stored from the location 2010H using 8251.
(b) Write an 8086 instruction sequence for receiving 50 characters using 8251 and store them in memory at location 2080H. [8+8]
6. Discuss the following signals of 8051
 - (a) $\overline{INT0}$ / $\overline{INT1}$
 - (b) $\overline{RD}$
 - (c) $\overline{PSEN}$
 - (d) ALE
 - (e) T0 and T1
 - (f) $\overline{EA}$
 - (g) TxD
 - (h) RxD [16]
7. (a) Write 8051 program to generate 2 kHz square waves on pin P1.0 of port 1 using Timer interrupt.
(b) Write 8051 program to receive a serial byte through RxD. [8+8]

8. (a) Interface the 7-segment displays in time-multiplexing and display select method and explain the same.
- (b) Write a 8051 program to control the operation of a 7-segment displays with time multiplexing and display method. Assume that the 7-segment codes for the characters to be displayed are at 40,42,44,46H respectively in the internal RAM. Whereas, the cathode select codes for each of the displays are at 41,43,45,47H respectively. [8+8]

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1. (a) Discuss about the interface signals of the 8086 processor in maximum mode
(b) Discuss SBB, AAD, TEST, SCAS instructions of 8086. [8+8]
2. (a) Explain the following Assembler Directives
 - i. EXTRN
 - ii. GROUP
 - iii. PUBLIC
 - iv. DW
 - v. GLOBAL(b) Write an ALP to Subtract two 16-bit numbers. [10+6]
3. Interface a 4 x 4 key board with 8086 using 8255 and write an ALP for detecting the key closure and return the key code in AL. The debouncing period for a key is 10 ms. Use software key debouncing technique. DEBOUNCE is an available 1 ms delay routine. [16]
4. (a) Explain the priorities of DMA requests
(b) Explain the interfacing of 8257 with 8086. [6+10]
5. (a) List and briefly describe the function of the three signal groups of the GPIB.
(b) Draw the data transfer and handshake waveforms. [10+6]
6. (a) Discuss in detail about 8051 instruction set.
(b) Give the comments for the following instructions.
 - i. MOV @R_P, #n
 - ii. MOV A, 80h
 - iii. MOV 0A8h, 77h
 - iv. MOV A, add
 - v. MOV add, @R_P
 - vi. MOV A, @R₀[10+6]
7. (a) Write 8051 program as an example of interrupt call to a routine, timer 0 is used in mode 0 to overflow and set the timer 0 interrupt flag. When the interrupt is generated, the program vectors to the interrupt routine, resets the timer 0 interrupt flag, stops the timer, and returns.

- (b) Discuss the bit format of IP register of 8051? [8+8]
8. (a) Draw the circuit diagram to interface the DAC to the microcontroller and explain.
- (b) Give the differences between microprocessors and microcontrollers? [8+8]

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1. Explain the arithmetic instructions of the 8086 processor. [16]
2. (a) Write an 8086 Assembler Program that adds two given 4-digit BCD numbers
(b) How do you pass parameters to a MACRO? [12+4]
3. Interface ADC 0808 with 8086 using 8255 ports. Use Port A of 8255 for transferring the digital data output of ADC to the CPU and Port C for control signals. Assume that the analog input is present at I/P of the ADC and clock input of suitable frequency is available to ADC. Draw the schematic and the required ALP. [16]
4. (a) Explain the bus structure of 8086 system
(b) Explain the fundamental concepts of DRAM controller. [8+8]
5. (a) Describe the bit assignment for mode instruction format of 8251 for both Synchronous and Asynchronous modes.
(b) Write an instruction sequence for initializing 8251 for the following combination.
 - i. Asynchronous mode
 - ii. Even parity
 - iii. 7 data bits
 - iv. 2 stop bits
 - v. 6400 baud rate[8+8]
6. (a) Explain the arithmetic instructions of 8051 with examples.
(b) Write 8051 program to subtract the contents of RAM location 13h from RAM location 2Bh, put the result in RAM location 3Ch. [8+8]
7. (a) Write 8051 program as an example of interrupt call to a routine, timer 0 is used in mode 0 to overflow and set the timer 0 interrupt flag. When the interrupt is generated, the program vectors to the interrupt routine, resets the timer 0 interrupt flag, stops the timer, and returns.
(b) Discuss the bit format of IP register of 8051? [8+8]
8. (a) Explain with a neat diagram how push button and LED can be connected to 8051

Code No: R05320202

Set No. 3

- (b) Mention any application of electromagnetic relay and explain how a electromagnetic Relay is connected to a 8051 microcontroller with diagram. [8+8]

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1. Draw the maximum mode block diagram of 8086 processor and explain its function. [16]
2. (a) What is a MACRO? How do you pass parameters to MACROs?
(b) Write a program to implement FOR loop using instructions of 8086. [8+8]
3. (a) Explain the basic steps involved in an A/D converter
(b) Explain the block diagram of an ADC 0808/0809. [8+8]
4. (a) Explain the Static Ram interfacing
(b) Interface TWO 4KX8 EPROMS and two 4K X 8 RAM chips with 8086. Select suitable memory map. [6+10]
5. (a) Draw the internal block diagram of 8251 and explain about each block in detail.
(b) Distinguish between Synchronous and Asynchronous data formats. [10+6]
6. (a) Explain the following instructions?
 - i. ANL P0, #0Fh
 - ii. CPL A
 - iii. CLR ACC.5
 - iv. XRL add, #n
(b) Write 8051 program to OR the contents of ports 1 and 2, put the result in external RAM location 0102h. [8+8]
7. (a) Write 8051 program to initialize timer 1 in mode 1.
(b) Write 8051 program to generate 2 kHz square waves on pin P1.0 of port 1 using Timer 0 auto reload mode. [8+8]
8. (a) Interface the 7-segment displays in time-multiplexing and display select method and explain the same.
(b) Write a 8051 program to control the operation of a 7-segment displays with time multiplexing and display method. Assume that the 7-segment codes for the characters to be displayed are at 40,42,44,46H respectively in the internal RAM. Whereas, the cathode select codes for each of the displays are at 41,43,45,47H respectively. [8+8]
