

**Code No: V3221****R07****Set No: 1**

III B.Tech. II Semester Supplementary Examinations, November/December - 2012

**MICRO PROCESSORS AND INTERFACING**

(Common to Electronics and Communications Engineering &amp; Electronics and Instrumentation Engineering &amp; Bio-Medical Engineering)

**Time: 3 Hours****Max Marks: 80**Answer any FIVE Questions  
All Questions carry equal marks

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1. List different addressing modes of 8086 microprocessor and explain the physical address formation in different addressing modes.
2. a) Write an assembly language program in 8086 to convert packed BCD number into unpacked BCD number.  
b) Write an assembly language program to convert a BCD number to ASCII number.
3. Draw typical 8086 minimum mode configuration and explain the functions of the signals used in minimum mode.
4. What is the difference between simple I/O, strobed I/O and bidirectional I/O with reference to 8255? Discuss the required control signals and their timing sequence for each mode of operation.
5. a) What is an interrupt? Which interrupt type is associated with NMI? Mention its vector address.  
b) What is an interrupt controller? Explain the features of programmable interrupt controller 8259A.
6. List the main features of 8251. With a neat block diagram, explain the architecture of 8251 USART.
7. What is meant by paging? What are its advantages? Explain the process of converting linear address into physical address.
8. a) Enlist the salient features of 8051 microcontroller.  
b) List and explain the register set of 8051 microcontroller.

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1. a) Draw the flag register of 8085 microprocessor and explain each flag.  
b) Explain the different assembler directives of 8086 microprocessor.
2. a) Write an ALP in 8086 to convert a four digit decimal number to its binary equivalent.  
b) Write an ALP to find out the factorial of a given number.
3. Draw a diagram to interface 2 chips of 8K ROM and 2v chips of 8K RAM consecutively with microprocessor 8086. Explain the interfacing.
4. a) What is BSR mode of operation of 8255? How it is useful in controlling the interrupt initiated data transfer for mode 1 and 2?  
b) Interface a typical 12-bit DAC with 8255 and write a program to generate a sawtooth waveform of period 10 ms. The CPU runs at 5 MHz clock frequency.
5. a) Difference between maskable and non-maskable interrupts? Also give some examples?  
b) Explain the command words/control words of 8259 in details.
6. Draw and discuss the asynchronous mode transmitter and receiver data formats of 8251.
7. a) List the main features of the 80386 microprocessors.  
b) Explain the physical memory system of 80386.
8. a) Explain why data pointer is 16 bits wide and the stack pointer is 8 bit wide in 8051? Justify.  
b) What are different addressing modes supported by 8051 microcontroller? Explain with examples.

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1. a) How does the 8086 CPU identify between 8-bit and 16-bit operations? Explain.  
b) List and explain different logical instructions of 8086.
2. a) Write an ALP in 8086 to find out the number of even and odd numbers from a given series of 16-bit hexadecimal numbers.  
b) Write an ALP in 8086 to convert a four digit hexadecimal number to decimal number.
3. What is Direct Memory Access (DMA)? What is its need? Draw and discuss the block diagram of 8257 DMA controller.
4. What are the features of 8279? Draw the functional block diagram of 8279 IC and explain its input modes.
5. Explain the following modes of operation of 8259.
  - (i) Fully nested mode
  - (ii) Rotating priority mode
  - (iii) Special masked mode and
  - (iv) Polled mode
6. a) Draw and discuss the status word format of 8251.  
b) What is USB? Explain in details.
7. What are the salient features of the Pentium processor? Explain the memory system of Pentium processor. Also explain the new Pentium instructions.
8. a) Explain with suitable examples, the addressing modes used by 8051 to access program memory.  
b) Explain the interrupt structure of the 8051 microcontroller.

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1. What do you mean by an addressing mode? What are the different addressing modes supported by 8086? Explain each of them with suitable examples.
2. a) Write an assembly language program in 8086 to find out the number of positive numbers and negative numbers from a given series of signed numbers.  
b) Write an assembly language program in 8086 for the addition of two 3x3 matrices.
3. Differentiate between minimum mode and maximum mode of operation of 8086. With neat timing diagrams, explain the maximum mode operation of 8086 microprocessor. Also explain the need for bus controller.
4. Design a stepper motor controller and write an ALP to rotate a 200 teeth, 4 phase stepper motor as specified below.
  - (i) Ten rotations in clockwise direction
  - (ii) Five rotations in anticlockwise direction
  - (iii) Rotate through an angle  $135^{\circ}$  in 2 sec.
5. a) What is interrupt pointer table? Explain the dedicated interrupts of 8086.  
b) What is the purpose of operational command words of 8259? Explain their format and the use.
6. Draw and explain the synchronous mode transmit and receive data formats of 8251.
7. a) List the salient features of the 80386 processor. Also state the versions of 80386 processor.  
b) What do mean by branch prediction? How does it enhance the speed of execution?
8. a) Draw and explain the architectural diagram of 8051 microcontroller.  
b) Differentiate between a microprocessor and a microcontroller

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