

CS/B.Tech/Even/EIE/6th Sem/E1-603/2014

**2014**

**Advanced Microprocessors & Microcontrollers**

**Time Alloted : 3 Hours**

**Full Marks : 70**

*The figure in the margin indicate full marks.*

*Candidates are required to give their answers in their own words as far as practicable*

**GROUP - A**

**( Multiple Choice Type Questions )**

1. Choose the correct alternatives for any ten of the following 10x1=10
- i. Which technology is used in 8086 microprocessor:-  
a. HMOS      b. CMOS      c. PMOS      d. NMOS
  - ii. When 8086 processor sends out data, which signal is active high:  
a. (DEN)'                      b. DT/R'  
c. (BHE)'/S<sub>0</sub>                      d. ALE
  - iii. How many segments are present in 8086 1MB memory space:  
a. 12              b. 10              c. 18              d. 16
  - iv. 8086 exchanges data word with odd memory bank when:-  
a. (BHE)'=0 and A<sub>0</sub>=0              b. (BHE)'=0 and A<sub>0</sub>=1  
c. (BHE)'=1 and A<sub>0</sub>=0              d. (BHE)'=1 and A<sub>0</sub>=1
  - v.  $\overline{\text{TEST}}$  input pin in 8086  $\mu\text{p}$  is checked by the instruction  
(a) WAIT      (b) LOCK      (c) NOP      (d) ESC
  - vi. Which registers are used as the base location for all executable

CS/B.Tech/Even/EIE/6th Sem/E1-603/2014

Instruction and stack?

- a) CS & SS respectively
- b) DS & SP respectively
- c) ES & SS respectively
- d) SS & CS respectively

vii. What physical address is represented by 4370:561EH?

- a) 4370EH
- b) 0561EH
- c) 48D1E
- d) 5A550H

viii. The instruction queue length of 8086 microprocessor is

- a) 4 bytes
- b) 6 bytes
- c) 8 bytes
- d) 9 bytes

ix. In the 8086 interrupt pointer table, address location 00008H - 0000BH indicates

- a) CS Base address in 00008H - 00009H & IP Offset address in 0000AH-0000BH of Type 1 Interrupt
- b) IP offset address in 00008H - 00009H & CS Base address in 0000AH-0000BH of Type 2 Interrupt
- c) CS Base address in 00008H - 00009H & IP offset address in 0000AH-0000BH of Type 2 Interrupt
- d) None of these.

x. The number of 16 bit timer/counter register present in 8051 is

- a) 3
- b) 4
- c) 2
- d) 5

xi. Which of the following pins is used for external access enable pin for 8051?

- a)  $\overline{\text{PSEN}}$
- b)  $\overline{\text{EAV}}_{\text{pp}}$
- c) XTAL1
- d) RST/ $V_{\text{PD}}$

xii. Which of the following registers of 8051 is bit addressable

- a) SBUF
- b) TMOD
- c) PCON
- d) PSW

**GROUP - B****( Short Answer Type Questions )**Answer any *three* of the following.

3x5=15

2. a) Explain the concept of segmented memory. What is its advantage?

CS/D.Tech/Even/EIE/6th Sem/E1-603/2014

- b) Describe the operation that an 8086 will perform when it executes each of the following instructions:

**MOV BX, 03FFH**

**MOV DH, CL**

**MOV AX, BX**

**SHL 01H**

(3+2)

3. Write a program in 8086 to find out the number of even and odd numbers from a given series of 16 bit hexadecimal numbers.

4. Describe the different addressing modes of 8086. (5)

5. Explain the role of the following pins

**NMI,  $\overline{\text{DEN}}$ ,  $\overline{\text{DT/R}}$ ,  $\overline{\text{BHE}}$ ,  $\overline{\text{MN/MX}}$**

(5)

6. (a) What is the addressing mode that is suitable for look-up table access in 8051?

(b) What is the difference between LJMP, SJMP and AJMP instructions in 8051 microcontroller 8051?

(1+4)

### GROUP - C

( Long Answer Type Questions )

Answer any *three* of the following.

3x15=45

7. a) Interface an 8255 with 8086 to work as an I/O port. Initialize port A as output port, port B as input port and port C as output port. Port A address should be 0740H. Write a program to sense switch positions SW<sub>0</sub> - SW<sub>7</sub> connected at port B. The sensed pattern is to be displayed on port A, to which 8 LEDs are connected, while the port C<sub>lower</sub> displays number of ON switches out of the total 8 switches.

b) Initialize the 8237 for memory to memory DMA transfer mode using channel 0, masking all other channels. Initialize the 8237 for normal timings, fixed priority, extended write with DREQ & DACK as active high. The 8237 should work in auto initialization mode with address increment, block mode select with read transfer on channel 0. Further, write a program to transfer a data block of

CS/B.Tech/Even/EIE/6th Sem/E1-603/2014

size 4KB available at 5000H:0000H to 5000H: 1000H (8+7)

8. a) Briefly discuss different transfer modes of 8237 DMA controller.  
b) Why are the program counter & data pointer registers of 8051 16 bit wide, where as the 8051 stack pointer register is 8 bit wide only? Justify.  
c) Briefly discuss the bit formats of TMOD, TCON registers of 8051 micro controller.  
d) Write the functions of PSEN & ALE pins of 8051 microcontroller (5+2+6+2)
9. a) Design an interface between 8086 CPU and two chips of 16K x 8 EPROM and two chips of 32K x 8 RAM. The RAM address must start at 00000H. Select the starting address Of EPROM suitably.  
b) Explain mode instruction control word format of 8251 USART.  
c) In context of 8259 Priority interrupt controller, briefly describe Fully Nested Mode and EOI command. (6+4+5)
10. a) Describe the difference between microprocessor and microcontroller.  
b) What are the special purpose register available in 8051 microcontroller?  
c) Write the different addressing modes of 8051 micro controller.  
d) Explain the following instructions of 8051:  
i) ACALL  
ii) MOV.R0, # 30H  
iii) DJNZ 40H, LABEL- 1 (2+3+4+6)
11. Write short notes on (any three): 3x5  
a) Read & write cycle of 8086.  
b) Interrupt sequence of 8086,  
c) Clock generator 8284 A.  
d) SFR of 8051 microcontroller.  
e) Square wave generation using Bit addressing of a I/O port.

