Name : ……………………………………………………

Roll No. : ……………………………………………………

Invigilator's Signature : ………………………………….

CS/M.TECH(EDPS)/SEM-3/EDPM-301(B)/2012-13

2012

MICROPROCESSOR & MICROCONTROLLER

Time Allotted : 3 Hours   *Full Marks :* 70

The figures in the margin indicate full marks.

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

Answer any *five* questions.

1. a) Draw and explain memory structure of 8086 μP.   7

   b) Write a program in 8086 μP to add the elements of two (3 × 3) matrices in which first and second matrix elements are stored from 3000 H and 4000 H offset address and the results store from 6000 H.   4

   c) Select a SUB instruction that will

      i)   subtract BX from CX

      ii) subtract OEEEH from DH

      iii) subtract DI from SI.   3

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2. a) Explain the functions of the different flags of the 8086 μP. 3

b) Explain the functions of the BIU and EU of the 8086 μP with block diagram. 6

c) What are the advantages of having segmentation ? How does the 8086 microprocessor support segmentation ?

5

3. a) What do you mean by addressing mode ? What are the different addressing modes supported by 8086 ? Explain each of them with suitable examples. 5

b) A single instruction may use more than one addressing mode or some instructions may not require any addressing mode. Explain. 2

c) What is the difference between MAX Mode operation and MIN Mode operation in 8086 μP ? 3

d) Describe the process of data transfer from the peripheral to the system memory under 8237 DMA controller. 4

4. a) What are the differences between memory mapped I10 and I10 mapped I10. 3

b) Interface 16 bit 8255 ports with 8086. The address of the port A is FOH. 4

c) Interface ADC 0808 with 8086 using 8255 ports and write required ALP. 5

d) Write down the control word of I10 mode and BSR mode in 8255. 2

5. a) Draw and discuss in brief, the internal architecture of Intel 8051. 5

b) Describe different sources of interrupt in 8051. 3

c) Describe the functions of different bits of PSW register.

3

d) How many addressing modes are supported by the 8051 ? State them with example. 3

6. a) Explain the initialization sequence of 8259. 7

b) How will you provide more than eight interrupt lines to an 8086 based system ? Design an interrupt system which provides twenty-nine interrupt inputs to the 8086 system using 8259. 7

7. a) What do you mean by USART ? 2

b) Why is USART used ? 2

c) Design the hardware interface circuit for interfacing 8251 with 8086. Set the 8251 in asynchronous mode as a transmitter and receiver with even parity enabled 2 stop bits, 8-bit character length, frequency is 160 kHz and baud rate 10 k. Write an ALP to

i) transmit 100 bytes of data string stored from 2000 : 3000 H.

ii) receive 100 bytes of data string and store it from 3000 : 4000 H. 10

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