Total No of Questions: [12] *SEAT NO. :* [ ]

[Total No. of Pages : 02]

T. E. 2008 (Electronics Engineering)

Microcomputer Based System

(Semester - II)

Time: 3 Hours *Max. Marks : 100*

Instructions to the candidates:

1) ***Answers to the two sections should be written in separate answer books.***
2) ***Answer three questions from each section.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Figures to the right indicate full marks.***
5) ***Assume Suitable data if necessary.***

SECTION I

Q1) a) How many functional units does 8086 contains? Draw and explain them in brief. [10]

b) What is the function of READY, ALE, HOLD and NMI signals in the 8086? [08]

OR

Q2) a) How the 20 bit physical memory address is calculated in the 8086 processor? The content of DS and BX register are 2500H and 1000H respectively, while executing the instruction MOV CX,[BX], from which memory location the 8086 will fetch the data? [06]

b) State the difference between minimum and maximum mode operation of 8086. [06]

c) What is pipelining? How it is achieved in 8086? What are its advantages? [06]

Q3) a) Explain with suitable example [08]
i) PUSH ii) AAA iii) TEST iv) CMPSW

b) Write an assembly language program of 8086 to convert upper case to lower case and lower case to upper case. [08]

OR

Q4) a) Draw and explain interrupt response sequence of 8086, when any hardware or software interrupt is arrived. [08]

b) Write an assembly language program to find the number of positive and negative data items in an array of 50 bytes of signed data stored from the memory location 3000H:4000H. Store the result in the offset address 1000H and 1001H in the same segment. Assume that the negative numbers are represented in 2's complement form. [08]

Q5) a) Draw the register set of 80386 in protected mode and explain a typical function of each register. [10]

b) Write a short note on virtual 86 mode of 80386. [06]

OR

Q6) a) Draw and explain the paging mechanism of 80386. [08]

b) Draw and explain the structure of 80386 descriptor. Enlist different descriptor types supported by 80386. [08]

SECTION II

Q7) a) Explain with block diagram IBM PC System based motherboard. [10]

b) Draw pins and signals of serial COM port and describe each signal. [08]

OR

Q8) a) State and explain the features of USB. [10]
Explain with respect to USB
i) Endpoint
ii) Enumeration
iii) Different types of data transfer

b) Write short note on : [08]
i) BIOS ii) PS/2

Q9) a) Draw and explain ARM7 TDMI core data flow model. [08]

b) Explain the following instructions of ARM7TDMI with example [08]
i) LDR ii) UMULL iii) B iv) MLA

OR

Q10) a) List and explain register structure of ARM core. [08]

b) Enlist and explain various modes of operation of ARM core. [08]

Q11) Design 8086/ARM7 based system to control the furnace temperature, whose temperature should be constant at 100^0c. If temperature goes beyond 100^0c then system should turn on RED LED and if temperature goes below 100^0c system should turn on GREEN LED. [16]
i) Design signal conditioning circuit.
ii) Explain important design steps.
iii) Draw the complete interfacing diagram.
iv) Draw the flow chart.

OR

Q12) a) State and explain various design steps involved in designing Data Acquisition System. [08]

b) Interface a DC motor to 8086 / ARM7 processor and draw flow chart. [08]