COMP 5 – 3 (RC)

T.E. (Computer) Semester – V (RC) Examination, Nov./Dec. 2010
MICROPROCESSOR AND MICROCONTROLLER

Duration : 3 Hours Total Marks : 100

Instructions : *1) Answer **five** questions by selecting at least **one** from **each** Module.*
*2) Make suitable assumptions **if required**.*

MODULE – I

1. a) Explain with an example following instructions with respect to 8086. 8
   i) XCHG
   ii) IN
   iii) SAHF
   iv) CBW.
   b) Explain the timing diagrams for read cycle and write cycle of 8086 in minimum mode operation. 8
   c) Write a 8086 ALP to transfer a block of data from one location to another location. 4

2. a) The contents of registers and memory locations of 8086 system at a given time are given below : 8

   (DS) = 6000H, (DI) = 3000H, (BX) = 2000H, (AX) = 2000H, (SS) = 3000H
   (SI) = 5000H, (CX) = 4000H, (BP) = 4000H, (SP) = 7000H, (CS) = 0000H,
   (IP) = 4000H.

   Find the effective address for the following addressing modes.
   i) Direct addressing mode
   ii) Register relative addressing mode
   iii) Based indexed addressing mode
   iv) Relative based indexed addressing mode.

P.T.O.

b) Explain the following with respect to 8086.

i) DB

ii) END

iii) EQU

iv) GROUP. 4

c) Write a short note on MACRO's and also explain :

i) Defining a MACRO

ii) Passing parameters to a MACRO. 8

MODULE – II

3. a) Explain the different data types supported by 8087. 7

b) Explain the purpose following instructions of 8087. 8

i) FSTCW

ii) FCLEX

iii) FLDLG2

iv) FLDPI.

c) Write 8087 ALP to find hypotenuse of a right angled triangle. 5

4. a) Explain in detail INT, INT3, INT0 interrupts in 8086 processor. 8

b) Perform the following data conversions with respect to 8087.

i) $(87.136)_{10}$ to long real format. 3

ii) $(23.25)_{10}$ to temporary real format. 3

iii) $(145.57)_{10}$ to short real format. 2

c) Explain the purpose of signals on the following pins of 8087. 4

i) INT

ii) Ready.

MODULE – III

5. a) Explain Asynchronous mode of operation in 8251. 8

   b) Explain with a neat sketch, the internal block diagram of 8254 timer. 8

   c) Explain the mode control word w.r.t. 8251. 4

      i) Mode instruction control word.

      ii) Command instruction control word.

6. a) Consider the port addresses as follows :

      Port A = 8000, Port B = 8001, Port C = 8002H, Control register = 8003H

      1) Identify the mode 0 control word to configure Port A and Port C_L as output ports and Port B and Port C_U as input ports. 2

      2) Write a program to read and display the reading from Port B at Port A and from Port C_L to Port C_U. 4

   b) Explain the purpose of signals on the following pins of 8251. 8

      i) TXE

      ii) $\overline{RTS}$

      iii) TXRDY

      iv) $\overline{RXC}$

   c) Give the features of Mode 0, Mode 1, Mode 2 operation of a Port of 8255. 6

MODULE – IV

7. a) State salient features of 80286. 4

   b) Explain in detail external H/W interrupts of 8051. 8

   c) Interface two 8K*8 EPROMS and two 8K*8RAM chips with 8086. Select suitable maps. 8

8. a) Give the advantages and disadvantages of register indirect addressing mode in 8051 microcontroller. 4

   b) What do you mean by descriptor ? 2

   c) Explain in detail the TMOD register in 8051.

   Find the value for TMOD if we want to program timer 0 in mode 2, use 8051 XTAL for the clock source, and use instructions to start and stop the timer. 9

   d) Write a short note on memory management unit of 80286. 5