COMP 5 – 3 (RC)

T.E. Computer Engineering (RC) (Semester – V) Examination, May/June 2016
MICROPROCESSORS AND MICROCONTROLLERS

Duration : 3 Hours

Max. Marks : 100

Instructions : *1) Assume **suitable** data **if** necessary.*
*2) Answer **any five** questions; attempt at least **one** question from **each** Module.*
*3) Draw **neat** diagrams **if** required.*
*4) Write question numbers **legibly** while answering.*
*5) Write description for the questions based on the marks **allotted**.*

MODULE – I

1. a) Draw and discuss the architecture of 8086. Mention the job performed by BIU and EU. **8**

   b) Describe memory segmentation of 8086. What is meant by currently active segment for 8086 ? List the advantages of segmentation of memory in 8086. **6**

   c) Explain the operation performed by the following instructions independently

   SHL BYTE PTR [0400h], CL

   MOV [BX] [DI]] + 4, AX

   XLAT

   XTHL. **6**

2. a) Write an 8086 program to sort in ascending order using bubble sort algorithm, given set of byte sized unsigned numbers in memory. The sorted elements should replace the original unsorted elements in memory. Use comments to explain the logic and assumptions. **10**

   b) What are instruction prefixes in the instruction set of the 8086 ? Explain their

MODULE – II

3. a) Describe the syntax and semantics of the each of the following 8087 instructions
   fld tax_rate
   fmul inflation _factor
   fsqrt
   fldpi
   fstsw check_Answer
   fptan. 6

   b) Discuss various exception condition which can occur when 8087 is executing its instructions. How does 8087 takes care of these exceptions ? Discuss NAN for 8087. 6

   c) Write a program to compute the roots of the quadratic equation $ax^2 + bx + c = 0$. Using 8087 co-processor instructions. Show stack contents of 8087 during each instruction execution. 8

4. a) Implement the input output procedures in 8086 to perform the following user defined libraries :
      a) Input integer number
      b) Output integer number
      c) Input string
      d) Output string. .Include comments of document the code. 10

   b) With the help of block diagram, explain the working I/O processor. 4

   c) Explain the functions of the following pins of 8087 :
      i) BUSY
      ii) RQ/GT
      iii) INT, with its interaction with 8086. 6

MODULE – III

5. a) Discuss the organization and architecture of 8255 programmable peripheral

6. a) Describe the circuit for interfacing an 8 bit ADC to 8086 through 8255A for simple I/O and interrupt I/O operations. **10**

   b) With the help of neat diagram explain Synchronous and Asynchronous serial transmission with the help of USART. **10**

MODULE IV

7. a) It is required to interface two chips of 32 K x 8 ROM and four chips of 32K x 8 RAM with 8086, according to following memory map.

   ROM 1 and 2 F0000H- FFFFFH

   RAM 1 and 2 D0000H-DFFFFH

   RAM 3 and 4 E0000H- EFFFFH

   Show the implementation of this memory system. **10**

   b) Describe how the 80386 produces a physical address when it is operating in paged mode. **10**

8. a) Explain bit patterns of TMOD and TCON special function register. Also describe the different modes of operating the timers in the case of 8051 microcontroller. **10**

   b) With the help of a neat block diagram, explain the programmer model of 8051 microcontroller. **10**