41614 M.

COMP 5 – 3 (RC)

T.E. (Comp.) (Semester – V) (RC) Examination, May/June 2014
MICROPROCESSORS AND MICRO CONTROLLERS

Duration : 3 Hours | Max. Marks : 100

Instructions : *1) Answer **any 5** questions by selecting atleast **one** from **each** Module.*
*2) **Assume** appropriate data **wherever** necessary.*

MODULE – I

1. a) Draw and explain the timing diagram for read cycle and write cycle of 8086 in minimum mode operation. **8**

   b) For the following instruction compute the address of memory operand for 8086
      i) MOV AX, [DX]
      ii) MOV AL, [BP+SI]
      iii) MOV [SI], BX

   Assume :

   CS = 0100 BP = 0100 DX = 0020 ES = 0300
   DS = 0200 SS = 0400 SI = 0300 SP = 0030. **5**

   c) Describe response of 8086 to following primitive string operations with example programs
      i) MOVS
      ii) CMPS
      iii) SCAS. **7**

2. a) Write 8086 ALP to sort set of N unsigned 8 bit numbers is descending order using selection sort. Add proper comments in the program. **8**

   b) Explain I/O addressing modes of 8086 processor with an example each. **6**

   c) Explain usefulness of the following instruction is 8086 with example.
      i) SAHF
      ii) CBW
      iii) IN
      iv) IMUL. **6**

P.T.O.

MODULE – II

3. a) With block diagram explain synchronization of 8086 and 8087. 8

   b) Explain working of stack in 8087. Support your answer with appropriate example. 6

   c) Explain functionalities provided by following interrupt service routines with example.
      i) INT 21h
      ii) INT 2h
      iii) INT 3h. 6

4. a) Draw and explain internal architecture of 8087. 8

   b) Explain the following instructions on detail
      i) FPTAN
      ii) FPREM
      iii) FSUBR
      iv) FXAM. 6

   c) Write 8087 program to prove the following identity $\sin^2(\text{theta}) + \cos^2(\text{theta}) = 1$ Add proper comments to explain the logic. 6

MODULE – III

5. a) Explain with neat block diagram the interval architecture of 8254 timer. 7

   b) Write notes on :
      i) Synchronous mode 8251
      ii) Asynchronous mode 8251. 7

   c) Draw block diagram of 8255. Explain control word register of 8255. 6

6. a) Explain purpose of the following signals
      i) SYNDET/BD
      ii) $\overline{DSR}$
      iii) TXRDY
      iv) $\overline{RTS}$
      v) $\overline{TXC}$. 5

b) Explain two methods of interfacing I/O devices. 6

c) Interface a 4 * 4 keyboard with 8086 using 8255. Also draw a flowchart for detecting a key closure and return the key code in AL. 9

MODULE – IV

7. a) Interface two 4K * 8 ROM and two 4K * 8 RAM chips with 8086. Select suitable map. 8

b) List major hardware and software features of 80286. 5

c) What are interrupts ? Explain different interrupts present in 8051. 7

8. a) Draw and explain all bits of flag register of 80286. 6

b) Explain different types of memories supported by 8051. 7

c) Explain addressing modes supported by 8051. 7