Second Semester M.Tech. Degree Examination, June/July 2016
Microprocessors and Microcontrollers

Time: 3 hrs.   Max. Marks:100

Note: *Answer any FIVE full questions.*

1 a. Compare and contrast between the microprocessors and microcontrollers. **(08 Marks)**
   b. Explain the functions of the following pins of 8086:
       i) $\overline{DEN}$ ii) $\overline{TEST}$
       iii) RESET   iv) READY.   **(07 Marks)**
   c. Elaborate on how the memory addresses are generated using the concept of segmentation.
                                                                         (05 Marks)

2 a. Draw and explain the functional block diagram of 8086 microprocessor.   **(08 Marks)**
   b. With a neat diagram, explain the format of flag register of 8086 microprocessor. **(07 Marks)**
   c. Compare the minimum and maximum modes of operation.   **(05 Marks)**

3 a. Identify the addressing modes of the following instructions and explain the operation:
       i)   MOV CX [BX + DI]
       ii)   ADD CL, MYLIST [SI + 2]
       iii) MOV CS, DS
       iv)   MOV AL, NUMBER.   **(08 Marks)**
   b. Write an assembly language program to exchange the contents of two words DATA1 and
       DATA2. Show the assembler directives as well.   **(07 Marks)**
   c. With neat diagrams, explain the different types of shift instructions.   **(05 Marks)**

4 a. Explain any four processor control instructions.   **(08 Marks)**
   b. Write an assembly language program to compare two sections of memory for match.
       Assume that the two strings exist namely STRING1 and STRING2, each having a length of
       16 bytes. Use CMPSB instruction. Indicate the assembler directives. **(07 Marks)**
   c. Compare the near CALL and far CALL instructions.   **(05 Marks)**

5 a. Explain the following interrupt related instructions in 8086 processor:
       i) INT   ii) IRET
       iii) INT3   iv) INTO   **(08 Marks)**
   b. Explain the SRAM and DRAM memory devices.   **(07 Marks)**
   c. What is meant by address decoding? Explain a simple NAND gate decoder for selecting a
       memory location. Draw the relevant diagram.   **(05 Marks)**

6 a. Compare the memory-mapped I/O and I/O mapped I/O techniques.   **(08 Marks)**
   b. With neat diagram, explain how a stepper motor can be interfaced with 8086
       microprocessor.   **(07 Marks)**
   c. List the salient features of PIC microcontrollers.   **(05 Marks)**

7   a. List and explain the various development tools for PIC microcontrollers.   (08 Marks)
    b. What is meant by a development system? Explain the various development systems for a microcontroller.   (07 Marks)
    c. List the additional functions added to microcontrollers to meet the market demands.   (05 Marks)

8   a. List the salient features of 8051 microcontroller.   (08 Marks)
    b. Draw the times/counter control logic diagram in 8051, and explain the operation. (07 Marks)
    c. List and explain the following special function registers of 8051:
        i) TCON   ii) SBUF   iii) IE.   (05 Marks)

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