Second Semester M.Tech. Degree Examination, December 2010
Microprocessors and Microcontrollers

Time: 3 hrs.   Max. Marks:100

Note: *Answer any FIVE full questions.*

1 a. Compare the microprocessors and microcontrollers. **(04 Marks)**
   b. Explain a µp based computer system, with a block diagram. **(10 Marks)**
   c. What are the segments registers? What are the advantages of using segment registers in 8086? **(06 Marks)**

2 a. Explain the following, with respect to the 8086 processor.
      i) General purpose registers   ii) Flag register
      iii) Instruction queue   iv) Ready signal and wait states. **(10 Marks)**
   b. Explain the different data related addressing modes, with examples. **(10 Marks)**

3 a. Explain with an example, the following instructions of 8086.
      i) LEA   ii) ADC   iii) MUL   iv) IDIV   v) AAM. **(10 Marks)**
   b. Write an ALP to add two packed BCD numbers (BCD1) = 1234 and (BCD2) = 4612. After each instruction, write the status of flags affected. **(06 Marks)**
   c. Write an ALP to add two double words in memory locations DP1 and DP2. Store the sum in memory location DPSUM. **(04 Marks)**

4 a. Explain with an example, the following instructions of 8086.
      i) JE   ii) JBE   iii) JMP   iv) LOOP Z   v) RET. **(10 Marks)**
   b. Write an ALP to move the contents of a block of memory to another area in memory. Use string instructions. **(06 Marks)**
   c. Explain with an example, REP prefix in 8086. What is the advantage of using REP prefix? **(04 Marks)**

5 a. Write a note on 8086 interrupts. **(10 Marks)**
   b. Compare input/ output mapped input/output and memory mapped input/ output. **(04 Marks)**
   c. Explain briefly, the static RAM (SRAM) and dynamic RAM (DRAM) memory devices. **(06 Marks)**

6 a. Write a schematic diagram of interface for temperature measurement. With a flow chart, explain how the temperature is controlled. **(10 Marks)**
   b. Show the general interfacing connections of a stepper motor. Explain a microprocessor based scheme to control the stepper motor speed and direction. **(10 Marks)**

7 a. Write notes on development systems for microcontrollers. **(04 Marks)**
   b. Write a note on PIC microcontrollers. **(06 Marks)**
   c. What are the functions of following 8051 pins?
      i) $\overline{EA}$ ii) PSEN   iii) ALE   iv) ADO – AD$_7$ v) RESET. **(10 Marks)**

8 a. Explain the internal RAM and internal ROM organization in 8051, with a diagram. **(06 Marks)**
   b. Write a note on input/output ports of 8051. **(06 Marks)**
   c. What are special function registers? List the special function registers of 8051. **(04 Marks)**
   d. Write a note on interrupts of 8051. **(04 Marks)**

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Second Semester M.Tech. Degree Examination, June-July 2009
Microprocessors and Microcontrollers

Time: 3 hrs.

Max. Marks:100

Note: *Answer any FIVE full questions.*

1 a. Explain in detail the salient features of 8086 microprocessor. (10 Marks)
   b. With a neat block diagram differentiate between a microprocessor and a microcontroller. (06 Marks)
   c. List the applications of a microcontroller. (04 Marks)

2 a. Explain the register organization of 8086. (06 Marks)
   b. What are 8086 flags and explain its functions. (06 Marks)
   c. Explain the memory segmentation in 8086 and how the 20 bit physical address is generated. (08 Marks)

3 a. With a neat diagram explain the functional architecture of 8086. (08 Marks)
   b. Draw the functional pin diagram of 8086 and briefly explain the pins of 8086. (12 Marks)

4 a. With a neat block diagram, explain the memory interfacing in 8086. (08 Marks)
   b. Explain the various addressing modes in 8086 with an example. (12 Marks)

5 a. Explain the following instructions :
      i)   SAL
      ii)   SHR
      iii) ROL
      iv)   STC
      v)   CMC. (10 Marks)
   b. Explain the various types of jump instructions used in 8086. (05 Marks)
   c. Explain the use of PUSH and POP instructions. (05 Marks)

6 a. Differentiate between I/O mapped I/O and memory mapped I/O. (08 Marks)
   b. What do you mean by interrupt priorities and state the interrupt priorities for 8086. (06 Marks)
   c. What is interrupt service routine? Explain. (06 Marks)

7 a. With a neat block diagram explain 8051 microcontroller. (10 Marks)
   b. Explain the special function registers of 8051. (05 Marks)
   c. Explain the timer modes of operation in 8051. (05 Marks)

8 a. Explain the TCON and TMOD function registers of 8051. (10 Marks)
   b. Explain 8051 interrupts and IE and IP function registers. (10 Marks)

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