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Fourth Semester B.E. Degree Examination, June/July 2014
Microcontrollers

Time: 3 hrs.   Max. Marks:100

Note: *Answer FIVE full questions, selecting*
at least TWO questions from each part.

PART – A

1 a. What is microcontroller? List out the difference between CISC and RISC.   (06 Marks)
   b. Explain the 8051 block diagram and its features.   (10 Marks)
   c. Briefly explain about stack and stack pointer operation.   (04 Marks)

2 a. Define addressing mode. Mention the various types of addressing modes with an example with respect to 8051.   (06 Marks)
   b. Explain the following instructions with an example:
       (i) DIV AB   (ii) SWAP A   (iii) RRC A   (iv) XCHD A @R_p (08 Marks)
   c. Write an ALP to perform 16-bit × 8-bit multiplication.   (06 Marks)

3 a. List out and explain different assembler directives used in an ALP.   (06 Marks)
   b. Briefly explain about what are the steps involve to create a program in an ALP. (08 Marks)
   c. Calculate the time delay for the following subroutine program. Assume XTAL = 11.0592 MHz.
```
          MOV  TMOD, #01
HERE:     MOV  TLO, #0F2H
          MOV  THO, #OFFH
          CPL P1.5
          ACALL  DELAY
          SJMP  HERE
;  _____ delay using timer 0
DELAY:    SETB  TRO
AGAIN:    JNB  TFO, AGAIN
          CLR  TRO
          CLR TFO
          RET
```
                                                                                       (06 Marks)

4 a. Explain about stepper motor interface with diagram and also write a 'C' program if a motor takes 90 steps to make one complete revolution and show the calculation. (Both clockwise & anticlockwise).   (12 Marks)
   b. Explain DAC interface with diagram and also write a 'C' program to generate stair case waveform.   (08 Marks)

PART – B

5 a. Define interrupt and mention the difference between interrupts and polling method.
                                                                                       (06 Marks)
   b. Explain about timer/counter control logic diagram and also briefly explain various timers mode operation.   (08 Marks)
   c. List out the various types of interrupts and also write the bit pattern of IE SFR with explanation with respect to 8051.   (06 Marks)

6 a. Briefly explain about DB-9 connector pins function. **(06 Marks)**

b. Write a 'C' program to send the messages "Normal speed" and "High speed" to the serial port. Assuming that SW is connected to pin P2.0, monitor its status and set the baud rate as follows:

        SW = 0, 28,800 baud rate

        SW = 1, 56K baud rate,   Assume XTAL = 11.0592 MHz. **(08 Marks)**

c. Write the steps to receive and transfer data serially. **(06 Marks)**

7 a. List out the features of MSP430. **(06 Marks)**

b. Briefly explain about MSP430 architecture with diagram. **(08 Marks)**

c. Briefly explain about memory space distribution with respect to MSP430. **(06 Marks)**

8 Write short notes on :

a. Internal RAM structure of 8051

b. Special function registers

c. Bit addressable instructions

d. Built in timers. **(20 Marks)**

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