USN ☐☐☐☐☐☐☐☐☐☐

Fourth Semester B.E. Degree Examination, December 2012
Micro Controllers

Time: 3 hrs.   Max. Marks:100

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

PART – A

1 a. Give the comparison between microprocessor and microcontroller. **(05 Marks)**
   b. With diagram, explain the architecture of 8051. **(10 Marks)**
   c. Give the bit and byte addresses of special function registers available in 8051. **(05 Marks)**

2 a. With example, explain the following 8051 instructions:
      i) CJNE;   ii) DAA;   iii) XCHD;   iv) PUSH;   v) SUBB. **(10 Marks)**
   b. A byte is stored in internal RAM location 40h write an ALP to count the number of 1's present in the byte and store the count in external memory location 5000h. **(06 Marks)**
   c. Explain bit level logical instructions of 8051. **(04 Marks)**

3 a. With example, explain the sequence of events that occur when a subroutine is executed. **(05 Marks)**
   b. Explain jump instructions with reference to range. Give the diagram. **(06 Marks)**
   c. Give the sequence of events that occur when a interrupt signal is generated. Also explain the role of bits in IE and IP SFR's in the process of interrupt. **(09 Marks)**

4 a. Write an 8051C program to toggle all bits of Port 0 and Port 2 such that Port 0 displays the complement of Port 2 continuously with a delay of 250 m sec. **(05 Marks)**
   b. Write a 'C' program to send out the value 44h serially one bit at a time via P1.0. The MSB should go out first. **(05 Marks)**
   c. Write an 8051 C program to monitor bit P 2.5 continuously. If it is high send 11h to P1 otherwise send FFh to P0. **(05 Marks)**
   d. Give the different data types in 'C' with range. **(05 Marks)**

PART – B

5 a. Explain with diagram, different modes of operation of timers/counters in 8051. **(10 Marks)**
   b. Write an ALP to generate square wave with ON time of 10 m sec and OFF time of 3 m sec on Port P1.0. Assume XTAL of 22 MHz. Use time 0 in mode 1. **(05 Marks)**
   c. Assume that 60 Hz external clock is applied to To. Write a 'C' program for counter 0 in mode 2 to display seconds and minutes on P1 and P2. **(05 Marks)**

6 a. Explain RS 232 hand shaking signals. **(05 Marks)**
   b. Explain the steps to
      i)   Transfer character bytes serially
      ii) Receive the data serially. **(10 Marks)**
   c. Explain the methods to increase baud rate of data transfer in 8051. **(05 Marks)**

7 a. Explain with diagram, how the sampling of low level triggred interrupt and edge triggered interrupt is done XTAL = 11.0592 MHz. **(06 Marks)**
   b. Generate a square wave from all pins of Port 0 having half the frequency of signal applied to INTO pin of 8051. Use an ALP. **(05 Marks)**
   c. What is the difference between interrupts and polling? Explain. **(05 Marks)**
   d. Explain RI and TI interrupts. **(04 Marks)**

8 a. With diagram, explain how to interface 4 × 4 matrix keyboard to 8051. Give the algorithm. **(10 Marks)**
   b. Give a scheme to interface ADC with 8051. Also write a program to do the conversion. **(10 Marks)**

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