Fourth Semester B.E. Degree Examination, June 2012
Microcontrollers

Time: 3 hrs.   Max. Marks:100

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

PART – A

1 a. Differentiate between RISC and CISC cpu architectures. **(06 Marks)**
   b. What is the internal memory capacity of 8051? Show the neat schematic of interface of external 8 K ROM and 16 K RAM to 8051. **(08 Marks)**
   c. Explain briefly a machine cycle. What is the time taken to execute a two –cycle instruction ANL A, #n if crystal frequency is
   i) 11.0592 MHz   ii) 16 MHz. **(06 Marks)**

2 a. What is addressing mode? Put the number 1Ah in registers R_3, R_4 and R_5 in four different addressing modes? **(07 Marks)**
   b. List bit-addressable instructions and their operation in 8051. Which flags are effected in such instructions. **(07 Marks)**
   c. The number ECh is placed some where in external Ram, between locations 2000 h and 2020h. Write program to find the address of that location and put that address in R_6(LSB) and R_7(MSB). **(06 Marks)**

3 a. Explain different ranges in jump instructions, with figure. **(08 Marks)**
   b. Compare jump and call instructions. **(04 Marks)**
   c. Two multibyte numbers num1 and num2 are stored at locations 20h, 21h, - - - - and 30h, 31h, 32h, - - - -, Add num1 and num2 store the result at locations 40h, 41h, 42h, ----, Use CALL and RET instructions in the ALP. **(08 Marks)**

4 a. What are the reasons for writing programs in C language instead of assembly language? **(04 Marks)**
   b. What are the ways to create a time delay in 8051C? Write C program to toggle all bits of ports p0 and p2 continuously, with a delay of few ms. **(08 Marks)**
   c. List bit-wise logical operators in C, with examples. Write C program to read P1.0 and P1.1 bits and issue an ASCII character to P0, according to the table given below :

P1.1	P1.0	
0	0	Send '0' to P0
0	1	Send '1' to P0
1	0	Send '2' to P0
1	1	Send '3' to P0

(08 Marks)

PART – B

5 a. Explain the different modes of operation of timer/counter with relevant block diagrams. **(12 Marks)**
   b. Write ALP to generate a square – wave of 2KHz, with a duty cycle of 66%. Use timer 0, mode 2. **(08 Marks)**

6 a. What is serial communication? How serial communication is carried- out with RS232 in 8051. **(06 Marks)**

b. Explain the bit pattern of SCON register. **(06 Marks)**

c. Write :

i) ALP to transfer serially letter 'A' continuously

ii) C program to receive bytes of data and put them in P1. Use baud rate of 9600, 8 bits and 1 stop bit, for both transmission and reception. Use timer 1, mode 2.

7 a. What are interrupts? Explain the interrupt system of 8051. **(08 Marks)**

b. With reference to Fig. Q7(b), normal status of INTI is high. Normal status of LED is OFF. When |NT| goes low, it turns ON LED and it remains ON for a fraction of second. Write program to perform the above function. **(06 Marks)**
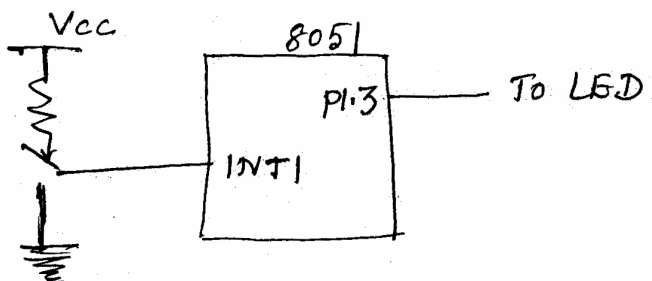

Fig. Q7(b)

c. Write C program that continuously gets a single bit of data from P1.7 and sends it to P1.0, while continuously creating a square wave of 200 μs period on P2.3. Use timer 0, mode2 to create square wave, assume XTAL = 11.0592 MHz. **(06 Marks)**

8 a. With a neat schematic diagram, show the interfacing of 8051 to ADC 0808 and write the steps to program 8051, to get data from ADC. **(10 Marks)**

b. Interface LCD module to 8051 and write program to display the word LCD. **(10 Marks)**

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