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Fourth Semester B.E. Degree Examination, Dec.2014/Jan.2015
Microcontrollers

Max. Marks: 100

Time: 3 hrs.

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

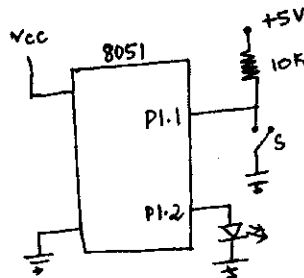
PART - A

- 1 a. With neat diagram, explain the internal architecture of 8051. (10 Marks)
 b. Compare microprocessor with microcontroller. (06 Marks)
 c. Calculate the time required for 2 machine cycle instruction (04 Marks)
 i) 12MHz ii) 11.0592MHz.

- 2 a. Explain following instructions mentioning their addressing mode and byte size. (12 Marks)
 i) XCHD A, @R₀ ii) MOVC A, @ A + DPTR iii) SUBB A, # 55h
 iv) DA A v) JBC bit, rel vi) ORL C, 100h.
 b. Explain the operation of following code with respect to stack. (05 Marks)
 MOV SP, # 10h
 PUSH SP
 POP 0E0h
 ADD A, # 10h. (03 Marks)
 c. Briefly explain the range of relative addressing. (04 Marks)

- 3 a. Explain ORG, END, DB and EQU directives. (04 Marks)
 b. Using subroutine, write a subroutine to get one second delay. Use subroutine names as follows : (10 Marks)
 for 1 ms subroutine: ONE_MILI_SUB
 for 1s Subroutine: ONE_SEC_SUB.
 c. Write a program to add 5 numbers. Numbers are stored between internal RAM 60h to 64h. (06 Marks)
 Store the result in R₀ & A.

- 4 a. With neat diagram, explain the internal structure of P1.0. (07 Marks)
 b. Write a program to read switch as shown below. If switch is closed, turn ON the LED else turn OFF the LED. (05 Marks)



- c. With interfacing diagram, write a program to rotate a stepper motor clockwise. (08 Marks)

PART - B

- 5 a. Explain TMOD & TCON registers with its bit pattern. (08 Marks)
 b. What are interrupts? Specify vector location or interrupts in 8051. (04 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

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- c. Generate square wave of 5kHz & 10kHz on P1.2 & P1.3. Continuously use timer 1 and time 2 in mode 2 for the purpose. (08 Marks)
- 6 a. Write the steps required to transfer data serially on 8051. (08 Marks)
b. Write a program to send 'Y' serially on 8051. Use baud rate of 2400 bauds. (06 Marks)
c. Briefly show control word of 8255 & specify mode selection. (06 Marks)
- 7 a. Explain the internal registers of MSP 430. (10 Marks)
b. Explain status register of MSP 430. (10 Marks)
- 8 a. Explain different addressing modes supported by MSP 430. (12 Marks)
b. Briefly explain the clock system of MSP 430. (08 Marks)
