

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

Time: 3 hrs.

Max. Marks:100

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
 - i) 12MHz ii) 11.0592MHz. (04 Marks)

- 2
 - a. Explain following instructions mentioning their addressing mode and byte size.
 - i) XCHD A, @R₀ ii) MOVC A, @ A + DPTR iii) SUBB A, # 55h
 - iv) DA A v) JBC bit, rel vi) ORL C, 100h. (12 Marks)
 - b. Explain the operation of following code with respect to stack.


```
MOV SP, # 10h
PUSH SP
POP 0E0h
ADD A, # 10h.
```

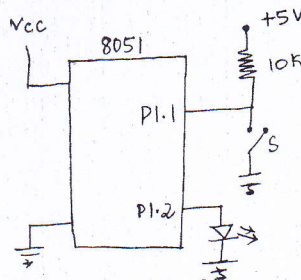
 (05 Marks)
 - c. Briefly explain the range of relative addressing. (03 Marks)

- 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 :


```
for 1 ms subroutine : ONE_MILI_SUB
for 1s Subroutine : ONE_SEC_SUB.
```

 (10 Marks)
 - c. Write a program to add 5 numbers. Numbers are stored between internal RAM 60h to 64h. Store the result in R₀ & A. (06 Marks)

- 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)

- 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)

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