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10ES42

Fourth Semester B.E. Degree Examination, June/July 2018
Microcontrollers

Time: 3 hrs.

Max. Marks:100

Note: 1. *Answer FIVE full questions, selecting*
at least TWO questions from each part.
2. *Standard notations are used.*
3. *Missing data may be suitably assumed.*

PART – A

1   a. What are the differences between microprocessor and microcontroller? **(04 Marks)**
    b. Explain in brief Harvard and Von-Neumann CPU architecture. **(06 Marks)**
    c. With neat block diagram, explain the architecture of 8051. **(10 Marks)**

2   a. Identify the addressing modes used in the following instruction:
       (i) MOV A, @ R1   (ii) MOV A, #52h   (iii) MOV A, 50h   (iv) SJMP NEXT
       (v) LJMP 1C00h. **(05 Marks)**
    b. With an example write the classification of instructions in 8051. **(10 Marks)**
    c. Explain the different types of Jump instruction in 8051. **(05 Marks)**

3   a. What are assembler directives? Explain any four assembler directives. **(08 Marks)**
    b. Write a program to subtract two 16-bit numbers in assembly language. **(06 Marks)**
    c. Find the delay produced by the following program, and assume that clock frequency is 11.0592 MHz.
       Delay : MOV R2, #30
       HERE : DJNZ R2, HERE
              NOP
              NOP
              RET **(06 Marks)**

4   a. Describe with functional block diagram 'Port 0' and 'Port 1' of 8051. **(10 Marks)**
    b. Write an 8051 C program to turn port line $P_{0.5}$ on and off 500 times, with a suitable delay. **(05 Marks)**
    c. Explain the technique of debouncing a key using a circuit diagram. **(05 Marks)**

PART – B

5   a. With a neat diagram, describe the interrupt structure of 8051 and also explain the interrupt control register. **(12 Marks)**
    b. Describe the mode 1 operation of Timer 0 with timer control logic diagram. **(08 Marks)**

6   a. Explain the function of each bit of SCON register in 8051. **(06 Marks)**
    b. Write the sequence of actions to be performed for serial data transmission. **(06 Marks)**
    c. Write the assembly language program to transfer letter C serially at 9600 baud rate continuously. Assume clock frequency of 11.0592 MHz. **(08 Marks)**

7   Write short notes on:
       (i)   Clock system of MSP 430   (ii)   Real time clock.
       (iii) 8255 PPI.   (iv)   Features of MSP430. **(20 Marks)**

8   a. Explain the bits of TCON register. Write an 8051 C program to toggle only bit P1.5 continuously every 50 msec. Use timer1 to generate the delay.
       Assume XTAL = 11.0592 MHz. **(10 Marks)**
    b. Give the control word format of 8255. Write an ALP (Assembly program) to send data 55H and AAH to port B continuously. Assume base address for 8255 as 4500H. **(10 Marks)**

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