USN [| | | | | | | | |]   **10ES42**

Fourth Semester B.E. Degree Examination, June/July 2016
Microcontrollers

Time: 3 hrs.   Max. Marks:100

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

PART – A

1   a.   Distinguish between :
         i) Microprocessor and Microcontrollers   ii) RISC and CISC Architecture.   **(08 Marks)**
    b.   Briefly discuss the features of 8051 Microcontroller.   **(06 Marks)**
    c.   With the help of a diagram, explain how to interface 8KB EPROM and 8KB RAM, to 8051
         Microcontroller.   **(06 Marks)**

2   a.   Explain the different addressing modes of 8051. Give an example for each one of them.
                                                                    (08 Marks)
    b.   Explain the following instructions :
         i) MUL AB   ii) DAA   iii)   MOVC A, @A+DPTR   iv) LJMP label   **(06 Marks)**
    c.   What is a stack? Explain with examples, the PUSH and POP instructions.   **(06 Marks)**

3   a.   What are assembler directives? Explain the functions of the assembler directives DB, EQU,
         END, ORG.   **(06 Marks)**
    b.   Write an ALP in 8051 to find the largest number among the 14_D, 8 bit number stored in
         internal RAM.   **(07 Marks)**
    c.   Write an ALP to toggle all bits of P1 every 200ms. Assume that the crystal frequency is
         11.0592MHz of 8051.   **(07 Marks)**

4   a.   Discuss the features of 4 I/O ports of 8051.   **(06 Marks)**
    b.   Interface 4 × 4 keyboard to 8051 and explain how scanning and identifying the key pressed
         is done.   **(07 Marks)**
    c.   Draw the block diagram to show how 8051 is connected to DAC 0808 at port P_1, using O/P
         buffer for DAC. Write an 8051 program to generate ramp, signal.   **(07 Marks)**

PART – B

5   a.   What is the difference between timer and counter? Explain the function of each bit in
         TMOD.   **(04 Marks)**
    b.   A switch is connected to pin P1.2. write an 8051 C program to monitor SW and create the
         following frequencies on pin P1.7 SW = 0 : 500 Hz, SW = 1 ; 750 Hz
         Use timer 0, mode 1 for both of them.   **(08 Marks)**
    c.   What are external interrupts? Draw the diagrams for activation of external interrupts. How
         level triggered interrupts are reset? How to set the two external interrupts as edge triggered
         interrupts?   **(08 Marks)**

6   a.   Write the steps required for programming 8051 to transfer data serially.   **(06 Marks)**
    b.   Write an 8051 C program to send to two messages "Normal speed" and "High speed" to the
         serial port. Assuming that SW (switch) is connected to pin P2.0, monitor its status and set
         the baud rate as follows : SW = 0 ; 28,800 baud rate, SW = 1 ; 56 K baud rate
         Assume that XTAL = 11.0592 MHz for both cases.   **(08 Marks)**
    c.   Explain the 4 modes of operation 8255 along with control word format.   **(06 Marks)**

7   a.   What are the features that make MSP430 suitable for Low-power and portable applications?
                                                                    (04 Marks)
    b.   Explain Registers and peripherals included on chip of MSP430 CPU.   **(06 Marks)**
    c.   Explain the architecture of MSP 430 with a neat diagram.   **(10 Marks)**

8   a.   Write an assembly program to generate a waveform with ON time of 7 msec and OFF time
         of 21 msec on P0.5. Assume XTAL of 11.0592MHz. Use timer 0.   **(10 Marks)**
    b.   Explain the bits of SCON register.   **(05 Marks)**
    c.   Draw the Pin diagram of 8255 and briefly explain the signals.   **(05 Marks)**

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