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

Microcontrollers

Time: 3 hrs.   Max. Marks:100

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

PART – A

1 a. With neat diagram, with the programming model of 8051 with addresses of SFR's and ports. Also give 128 bytes RAM allocation. **(12 Marks)**
   b. Interface 8051 to 8K external RAM and 32K external ROM and explain how 8051 access them? **(08 Marks)**

2 a. Explain difference addressing modes of 8051. Give an example for each of them and mention limitations of each. **(07 Marks)**
   b. Explain the following instruction of 8051 with example (values).
      i) XCHD A_1 @ Ri   ii) MOVC A_1 @ A + PC   iii) SWAP A
      iv) RL A   v) MUL AB   vi) DA A   **(09 Marks)**
   c. Examine the following code and analyse the result with flag register. Content
      MOV A_1 # −30d
      MOV R_2, # −50d
      ADD A, R_2 **(04 Marks)**

3 a. Explain the different types of conditional and unconditional jump instruction of and unconditional jump instruction of 8051. Specify the difference range associated with jump instruction. **(08 Marks)**
   b. Classify the CALL instruction in 8051. Explain each one. **(06 Marks)**
   c. Write a program to generate and store Fibonacci terms, which are less then FFh. **(06 Marks)**

4 a. What are assembler directives? Explain any four of them. **(05 Marks)**
   b. Write a program to find LCM (List Common Multiplier) of two number m_1 and m_2. **(09 Marks)**
   c. Explain C data types for 8051 with their data size in bits and data range. **(06 Marks)**

PART – B

5 a. Explain TMOD and TCON register of 8051 timers. **(10 Marks)**
   b. For every 50 chocolates, vending machine is getting heated up, it requires minimum of 1sec break after every 50 chocolates. Provide solution for this real time problem. **(10 Marks)**

6 a. What is baud rate? Which timer of the 8051 is used to set the baud rate? **(04 Marks)**
   b. Explain SCON register with its bit pattern. **(08 Marks)**
   c. Write a 8051 program to send the data message " MICROCONTROLLERS " of the length 17 character at a baud rate 2400, 8bit data, 1stop bit serially. **(08 Marks)**

7 a. Compare polling and Interrupt. Explain the six interrupt of 8051, with primary and interrupt vector table. **(08 Marks)**
   b. Write a program to move stepper motor by 20steps is anticlockwise direction interface. **(08 Marks)**
   c. Explain the advantages of interfacing 8255 with 8051 μc. **(04 Marks)**

8 a. Explain MSP430 architecture with neat block diagram. **(08 Marks)**
   b. Explain memory address space of MSP430 with neat diagram. **(04 Marks)**
   c. Write ALP to find larger element in a block of data using MSP430. **(08 Marks)**

* * * * *