USN

15MT43

Fourth Semester B.E. Degree Examination, Jan./Feb. 2021
Microcontroller

Time: 3 hrs.   Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. With a neat sketch, explain the architecture of 8051. **(10 Marks)**
    b. Give the difference between Harvard and Von-Neumann architecture. **(06 Marks)**

OR

2 a. With a neat sketch, explain the internal memory organization of 8051. **(10 Marks)**
    b. Explain the functions of following pins of 8051 microcontroller:
     i) $\overline{EA}$ ii) ALE   iii) $\overline{PSEN}$ **(06 Marks)**

Module-2

3 a. Define addressing mode. List and explain different addressing modes supported by 8051. Also give example for each. **(08 Marks)**
    b. Write an ALP to find the sum of 10 bytes present in a array with the starting address 40h. Store the result in 50h and 51h. **(08 Marks)**

OR

4 a. With a neat sketch, explain the different ranges of call and jump instruction. **(08 Marks)**
    b. Explain the following instruction mnemonic with example:
     i) DAA   ii) XCHD   iii) DIV AB   iv) RL A **(08 Marks)**

Module-3

5 a. Explain different data types supported by 8051C, with example for each. **(08 Marks)**
    b. List the different ways used to create delay in 8051C. Also write a C code to get a byte of data from P1, wait ½ second, then send it to P2. **(08 Marks)**

OR

6 a. With a neat sketch, explain the bit configuration of TMOD register. Also list the steps to program in mode 2. **(08 Marks)**
    b. With a frequency of 22 MHz, generate a frequency of 100 kHz on pin P2.3. Use Timer1 in Mode1. **(08 Marks)**

Module-4

7 a. With the neat sketch explain the hand shake signals of RS232. Also mention the need of MAX232 in serial data transmission. **(08 Marks)**
    b. Write an ALP to transmit a message "Hello MT" using serial communication with a baudrate of 9600, use 8 data bits 1 stop bit use Timer1. **(08 Marks)**

OR

8 a. Explain the importance of TI and RI flag in serial communication.   **(08 Marks)**

   b. Explain the different interrupt supported for 8051. Also write IP register bit configuration and explain each bit.   **(08 Marks)**

Module-5

9 a. With a neat circuit diagram and flow chart, explain how to interface 8051 with keypad.   **(10 Marks)**

   b. Write a C code to generate a sine wave using DAC.   **(06 Marks)**

OR

10 a. With a neat sketch, explain the pin description of ADC0804 chip.   **(08 Marks)**

   b. Write an assembly level program to rotate the stepper motor continuously in clockwise direction using the wave drive four step sequence.   **(08 Marks)**

* * * * *