USN | | | | | | | | | | 17MT43

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

Time: 3 hrs.   Max. Marks: 100

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

Module-1

1   a.   With the neat diagram, explain the internal memory organization of 8051.   **(10 Marks)**
    b.   Explain the functions of following pins of 8051:
         i) $\overline{EA}$ ii) $\overline{PSEN}$ iii)ALE   iv) TO   v) $\overline{INTO}$ **(10 Marks)**

OR

2   a.   With a neat diagram, explain the architecture of 8051.   **(12 Marks)**
    b.   List out the difference between Microcontroller and Microprocessor.   **(08 Marks)**

Module-2

3   a.   Explain the operation of following mnemonics in 8051 microcontroller with example for each: i) PUSH   ii) MOVE   iii) DAA   iv) XCHG   v) ANL.   **(10 Marks)**
    b.   Define addressing modes. List and explain different addressing modes with example for each.   **(10 Marks)**

OR

4   a.   Write Instructions to, swap the contents of register R7 and R6 in register bank 0 using 3 different method.   **(09 Marks)**
    b.   Write three different methods to clear the content of accumulator.   **(03 Marks)**
    c.   Explain different rotate instructions with neat sketch.   **(08 Marks)**

Module-3

5   a.   Write a 8051e program to toggle all the bits of P0 and P2 continuously with 250msec delay. Use EX-OR operator.   **(10 Marks)**
    b.   Explain different data types of 8051e.   **(10 Marks)**

OR

6   a.   With a neat sketch, explain the bit configuration of TMOD register. Also explain the steps involved in model Timer programming.   **(10 Marks)**
    b.   Write an 8051 e program to create a frequency of 2500Hz on pin P2.7. Use Timer 1, mode 2 to create the delay. XTAL = 11.0592MHz.   **(10 Marks)**

Module-4

7   a.   Explain three modes of serial data transmission with a neat sketch.   **(06 Marks)**
    b.   With a neat sketch, explain the bit configuration of 500N register.   **(06 Marks)**
    c.   Write an ALP to send the text string "Hello" using serial data transmission, set the band rate at 9600, 8-bit data and 1 stop bit. Use T1.   **(08 Marks)**

OR

8   a.   List and explain the different land shake signals of RS-232. Also mention the need for MAX-232 in serial data transmission.   **(10 Marks)**

    b.   Explain the importance of TI and RI flag.   **(10 Marks)**

Module-5

9   a.   With a neat circuit, explain the interfacing of stepper motor with 8051. Also write a program to rotate a motor 64° in clock wise direction. The motor has a step angle of 2° use 4 step sequence and two coil excitation.   **(10 Marks)**

    b.   With a neat circuit diagram and flow chart explain how keypad is interfaced with microcontroller. Also explain the procedure used to detect the pressed key.   **(10 Marks)**

OR

10 a.   Explain the pin description of LCD. Also write a program to display hello an LCD interfaced with microcontroller use delay method.   **(12 Marks)**

    b.   Write a C program to generate sine wave using DAC interfacing.   **(08 Marks)**

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