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17MT43

Fourth Semester B.E. Degree Examination, Dec.2023/Jan.2024
Microcontrollers

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 help of neat diagram, explain the architecture of 8051. **(12 Marks)**
   b. List out the difference between
      i) CISC and RISC
      ii) Microprocessor and microcontroller. **(08 Marks)**

OR

2 a. Mention the salient features of microcontroller. **(07 Marks)**
   b. With the neat diagram, explain PSW register of 8051 micro-controllers. **(07 Marks)**
   c. Explain the following pins of 8051 i) ALE ii) TO iii) PSEN. **(06 Marks)**

Module-2

3 a. Define addressing modes. Explain different addressing modes with suitable example. **(10 Marks)**
   b. Explain the operation performed by the following instructions.
      i) DA A   ii) MUL AB   iii) CJNE   iv) SETB C **(10 Marks)**

OR

4 a. Assume the P1 is an input port connected to a temperature sensor. Write a program to read the temperature and test it for the value 75. According to the test results place the temperature value into the register indicated by the following : If T = 75, then A = 75 if T < 75 then R1 = T, if T > 75 than R2 = T. **(10 Marks)**
   b. Assuming that ROM space starting at 250H contains "India" write a program to transfer the bytes in to RAM locations starting at 40H. **(10 Marks)**

Module-3

5 a. What are data types? Explain the different C data types for 8051 with their data size and data range. **(10 Marks)**
   b. Explain format of TMOD and TCON registers. **(10 Marks)**

OR

6 a. Define time delay? What are the ways to create time delay? Discuss factors affecting accuracy of time delay. **(10 Marks)**
   b. Explain Mode 1 programming and Mod 2 programming with diagrams. **(10 Marks)**

Module-4

7   a. List and explain the different Land shaking signals of RS232. **(06 Marks)**
    b. Write an assembly program to transfer a letter 'Y', 'E', 'S' serially at 9600 band continuously. **(08 Marks)**
    c. Write a C program for the 8051 to transfer the letter "A" serially at 4800 band rate continuously. Use 8 bit data and 1 stop bit. **(06 Marks)**

OR

8   a. Explain different interrupts of 8051 with the help of interrupt vector table. **(08 Marks)**
    b. Show instructions to
       i)   Enable the serial interrupt Timer 0 interrupt and external hardware interrupt
       ii) Disable the time 0 interrupt
       iii) Show how to disable all the interrupt with a single instruction. **(06 Marks)**
    c. Write 8051 C programs to receive bytes of data serially and put them into P1. Set the band rate at 4800, 8 bit data and 1 stop bit. **(06 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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