21EE43

Fourth Semester B.E. Degree Examination, June/July 2023
Microcontrollers

Time: 3 hrs.   Max. Marks: 100

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

Module-1

1   a. Explain the block diagram 8051 microcontroller.   (10 Marks)
    b. List the features of 8051 microcontroller.   (06 Marks)
    c. Explain the P.S.W and flag's bits.   (04 Marks)

OR

2   a. Explain the various addressing modes of 8051 microcontroller with examples.   (10 Marks)
    b. Explain with the help of diagram, how to interface external code memory to 8051 microcontroller.   (10 Marks)

Module-2

3   a. What are assembler directives? Explain various assembler directives.   (08 Marks)
    b. Explain the following Instructions of 8051 with examples:
       (i)   DJNZ R_1 , res   (ii) DA A   (iii) MOVX A, @ DPTR
       (iv) SWAP A   (v) XCHD @R_1 (vi) INC R_2 (12 Marks)

OR

4   a. With a neat diagram explain, the range of JUMP and CALL Instruction.   (08 Marks)
    b. Write an 8051 assembly program to find average of five numbers stored from Internal Data Memory address 40H.   (08 Marks)
    c. Explain Rotate Instruction of 8051 with examples.   (04 Marks)

Module-3

5   a. Explain the various data types in 8051 C.   (08 Marks)
    b. Write an 8051 C program to toggle the bits of P_1 ports continuously with a 250ms delay.   (06 Marks)
    c. Write an 8051 C program to toggle bit P2.4 continuously without disturbing the rest of bits of P_2.   (06 Marks)

OR

6   a. Explain TMOD register.   (06 Marks)
    b. Explain Mode-1 programming of 8051 Timer.   (06 Marks)
    c. Write an 8051 C program to convert packed BCD to ASCII and display the bytes on P_1 and P_2.   (08 Marks)

Module-4

7   a. What is serial data communication? Explain simplex, half duplex and full duplex transfer.   (08 Marks)
    b. Draw and explain the interface of RS232 to 8051 using MAX232.   (06 Marks)
    c. Write a C-program the 8051 to transfer the letter 'C' serially at 9600 baud continuously. Use 8-bit data and 1 stop bit.   (06 Marks)

OR

8 a. What is an Interrupt? List the various interrupts of 8051 with their corresponding vector address. (08 Marks)
   b. Explain the bit status of SCON Register. (06 Marks)
   c. Write a C-program that continuously get a single bit of data from P1.7 and send it to P1.0. While simulation creating a square wave of 200 μs period on P1A P2.5. Use timer-0 to create square wave Assume XTAL = 11.0592 μsec. (06 Marks)

Module-5

9 a. Explain pin diagram of 8255 chip. (07 Marks)
   b. Draw and explain the interface diagram of LCD with 8051 microcontroller. (07 Marks)
   c. Write an C-program to rotate stepper motor continuously in clockwise direction. (06 Marks)

OR

10 a. Draw the block diagram to show how 8051 in connected to DAC 0808 at port P_1. (07 Marks)
   b. Write a C-program to generate a sine wave using DAC. (06 Marks)
   c. Explain the Internal architecture of ADC 0804. (07 Marks)

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