CBCS SCHEME

USN | | | | | | | | | | |

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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