



CBCS SCHEME

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 R₁, res (ii) DA A (iii) MOVX A, @ DPTR
(iv) SWAP A (v) XCHD @R₁ (vi) INC R₂ (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 P₁ 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 P₂. (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 P₁ and P₂. (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 μ s period on P1A P2.5. Use timer-0 to create square wave Assume XTAL = 11.0592 μ sec. (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 is connected to DAC 0808 at port P₁. (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)
