



CBCS SCHEME

21EC652

Sixth Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025 Microcontrollers

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. List any four differences between a microprocessor and a microcontroller. (08 Marks)
- b. With a neat block diagram, explain the architecture of 8051 microcontroller. (10 Marks)
- c. What is the advantage of EEPROM version of microcontrollers? (02 Marks)

OR

- 2 a. What is the difference between Von Neumann architecture and Harvard architecture? (03 Marks)
- b. With a neat diagram, explain Internal RAM organization of 8051 microcontroller. (10 Marks)
- c. Draw a diagram showing the connection between a 8051 microcontroller and an external memory configuration consisting of 16K bytes of EPROM. (07 Marks)

Module-2

- 3 a. What is addressing mode? Explain different addressing modes of 8051 microcontroller. (10 Marks)
- b. Write an assembly language program to exchange the contents of external memory with addresses 8000H and 8001H. (10 Marks)

OR

- 4 a. Explain PUSH and POP instructions of 8051 microcontroller. (10 Marks)
- b. Explain the difference between MOVX and MOVC instructions of 8051 microcontroller. (06 Marks)
- c. Write an assembly language program to add two 8-bit numbers in internal RAM locations 40H and 41H and store the results (carry in 42H and sum in 43H) without using any Jump instruction. (04 Marks)

Module-3

- 5 a. Explain different Jump instructions in 8051 microcontroller. (09 Marks)
- b. Write an assembly language program to transfer a block of data of 140 numbers starting from internal RAM location 40H to internal RAM location starting from 50H. (06 Marks)
- c. What are the different data types of 8051 C? (05 Marks)

OR

- 6 a. Explain different types of CALL instructions in 8051 microcontroller. (08 Marks)
- b. Write an assembly language program's subroutine to create a delay using a single register. (05 Marks)
- c. Write an 8051 C program to toggle bits of P1 continuously with a 250 ms delay. (07 Marks)

Module-4

- 7 a. Explain TMOD register. (06 Marks)
b. Explain how to generate a time delay using 8051 timer in mode 2 operation. (08 Marks)
c. Write a C program for 8051 to transfer the letter "B" serially at 4800 baud continuously. Use 8-bit data and 1 stop bit. (06 Marks)

OR

- 8 a. Explain steps involved in transferring character bytes serially in 8051. (08 Marks)
b. Write an 8051 C program to toggle all the bits of Port P1 continuously with some delay in between. Use Timer 0, 16-bit mode to generate the delay. (10 Marks)
c. Define baud rate. (02 Marks)

Module-5

- 9 a. What is an interrupt? What is the advantage of interrupt over polling? (04 Marks)
b. Explain IE register. (08 Marks)
c. Draw the diagram showing interfacing of a stepper motor with 8051 microcontroller. (08 Marks)

OR

- 10 a. With a neat diagram, explain the interfacing of LCD to 8051 microcontroller. (10 Marks)
b. Write 8051 C program that creates a square wave 5 KHz frequency on pin P2.5 using timer 0 interrupt. Assume that XTAL = 11.0592 MHz. (10 Marks)
