



CBCS SCHEME

21EC652

Sixth Semester B.E. Degree Examination, June/July 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. What is the difference between the microprocessor and microcontroller? (04 Marks)
- b. With a neat diagram, explain the architectural features of 8051 μ c. (08 Marks)
- c. With a neat pin diagram of 8051 μ c and explain. (08 Marks)

OR

- 2 a. Write a note on embedded microcontrollers. (04 Marks)
- b. With a neat diagram, explain the Internal RAM organization of 8051. (08 Marks)
- c. Write the interfacing diagram of 4K bytes of RAM and 8K bytes of ROM. (08 Marks)

Module-2

- 3 a. Explain the different addressing modes of 8051 μ c. (10 Marks)
- b. Identify the addressing mode and working of instruction in the following:
 - (i) MOV A, #25H
 - (ii) MOV DPTR, #nn
 - (iii) MOV R3, #1Ch
 - (iv) MOVC A, @A + DPTR
 - (v) MOVC A, @A + PC(10 Marks)

OR

- 4 a. Write a program to copy the value of 55H into RAM memory locations 40H to 41H using
 - (i) direct addressing mode
 - (ii) register indirect addressing mode without a loop
 - (iii) with a loop(10 Marks)
- b. Write a program to store data FFH into RAM memory locations 50H to 58H using direct addressing mode. (10 Marks)

Module-3

- 5 a. Explain the types of CALL instructions. (06 Marks)
- b. Write a program to compute $1 + 2 + 3 + N$ (say $N = 15$) and save the sum at 70H. (06 Marks)
- c. Write a program to clear 10 RAM locations starting at RAM address 1000H. (08 Marks)

OR

- 6 a. Write a program to toggle all the bits of port 1 by sending to it the values 55h and AAh continuously. Put a time delay in between each issuing of data to port 1. (10 Marks)
- b. Write a program to toggle the bits of port 1 delay which depends on the value of a number in R0. (10 Marks)

Module-4

- 7 a. Write a note on TMOD and TCON register. (10 Marks)
- b. Write a program to continuously generate a square wave of 2 kHz frequency on pin P1.5 using timer 1. Assume the crystal oscillator frequency to be 12 MHz. (10 Marks)

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OR

- 8 a. Explain the types of serial communication. (06 Marks)
b. Explain the serial communication modes. (06 Marks)
c. Write a program for the 8051 to transfer letter 'A' serially at 4800 baud rate, 8 bit data, 1 stop bit continuously. (08 Marks)

Module-5

- 9 a. Write a note on IE and IP register. (10 Marks)
b. Write a ALP to switch ON a load connected at port Pin 1.3 when timer 0 interrupt occurs. Assume timer 0 operates as timer in mode 1. (10 Marks)

OR

- 10 a. Write an ALP to rotate the stepper motor clockwise/anticlockwise continuously with full step sequence. (10 Marks)
b. Explain with a neat diagram of DAC and necessary equation. (10 Marks)

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