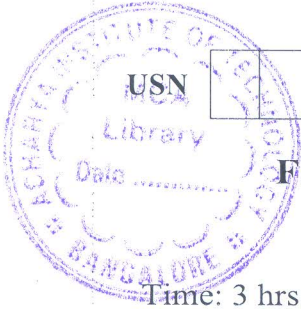


CBCS SCHEME



21MT44

Fourth Semester B.E. Degree Examination, June/July 2024 Microcontrollers and Applications

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. With a neat sketch, explain the architecture of 8051 microcontroller. (12 Marks)
b. List out the difference between:
i) Microcontroller and Microprocessor
ii) Hardware and Von-Neumann CPU architecture. (08 Marks)

OR

- 2 a. With a neat sketch, briefly explain the internal memory organization of 8051 microcontroller. (12 Marks)
b. List out the difference between RISC and CISC CPU architecture with neat sketch. (08 Marks)

Module-2

- 3 a. Define addressing modes. Explain different addressing mode with an example for each. (10 Marks)
b. With a neat sketch, explain the different range of JUMP instruction. (10 Marks)

OR

- 4 a. Explain the concepts of following:
i) Flags ii) Incrementing and Decrementing with examples. (10 Marks)
b. Explain the following instruction:
i) XCHA, Rr ii) RLC A iii) SUBBA, @Rp iv) MUL AB v) DIV AB (10 Marks)

Module-3

- 5 a. Explain the different data types in 8051C with any two types with example. (10 Marks)
b. Write an 8051 C program to toggle the bits of P1 ports continuously with a 250 ms delay. (06 Marks)
c. Mention difference between timer and counter. (04 Marks)

OR

- 6 a. Explain the different possible modes of operation timer. (10 Marks)
b. Write a 8051 C program to toggle all the bits of P0 and P2 continuously with 250ms delay. (06 Marks)
c. Define data serialization using 8051C. (04 Marks)

Module-4

- 7 a. With a neat sketch, explain the handshake signals of Rs.232. Also write null modem connection diagram. (10 Marks)
b. Define serial communication. Mention the types of serial data communication and explain different communication link or transmission with figures. (10 Marks)

OR

- 8 a. Explain different interrupts of 8051. Also write the interrupt vector table. (10 Marks)
b. Write a program to transfer a letter 'Y' serially at 9600 baud continuously and also to send a letter 'N' through port 0, which is connected to a display device. (10 Marks)

Module-5

- 9 a. Write a 8051 C program to send letter 'M', 'D' and 'E' to the LCD using delay. (10 Marks)
b. With a neat diagram, explain the interfacing of stepper motor with 8051 microcontroller. (10 Marks)

OR

- 10 a. Explain how to interface of DC motor with 8051 microcontroller with necessary diagram. (10 Marks)
b. A switch is connected to pin P2.7. Write a program to monitor the status of SW and perform the following:
i) If SW = 0, the stepper motor moves clockwise
ii) If SW = 1, the stepper motor moves counter clock wise. (10 Marks)
