

CBCS SCHEME

18MT43

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Fourth Semester B.E. Degree Examination, Dec.2023/Jan.2024 Microcontroller

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 diagram, explain the architecture of 8051. (12 Marks)
b. Explain the functions of following pins of 8051, (08 Marks)
i) ALE ii) TO iii) \overline{EA} iv) $\overline{INT0}$

OR

- 2 a. List the differences between microprocessor and microcontroller with a neat block diagram. (08 Marks)
b. Illustrate how to interface 16K EPROM and 8K RAM with 8051 with a neat sketch and timing diagram. (12 Marks)

Module-2

- 3 a. Explain the junctions of following opcodes also illustrate it using example. (12 Marks)
i) MOVX ii) MOVC iii) PUSH and POP iv) XCH v) DJNZ vi) SWAP
b. With a neat diagram, explain the Range of Jump and call Instructions. (08 Marks)

OR

- 4 a. Explain the different addressing modes of 8051. Illustrate each with a suitable example. (10 Marks)
b. Consider a 10 bytes of data stored in memory location 9400h. Separate even and odd bytes store even bytes from location 30h and odd bytes from location 40h. (10 Marks)

Module-3

- 5 a. How to create a time delay in 8051C? List the 3 factors that effect the accuracy of delay. Write an 8051C program to toggle bits of P1 continuously with 250 msec. (10 Marks)
b. List and explain different data types of 8051C. Also write a 8051C program to convert packed BCD 0×29 to ASCII and display the bytes of P1 and P2. (10 Marks)

OR

- 6 a. List and explain the steps to generate time delay in mode 2. (08 Marks)
b. With a neat sketch, explain the bit configuration of TMOD register. (04 Marks)
c. Assume that XTAL 11.0592MHz, write a program to generate a square wave of 2KHz frequency on pin P1.5 using mode 1. (08 Marks)

Module-4

- 7 a. Explain different handshake signals of RS-232, Also mention the need for MAX232. (10 Marks)
b. Write an 8051 C program to transfer the message "YES" serially at 9600 baud rate, 8 bit data, 1 stop bit. Do it continuously. (10 Marks)

OR

- 8 a. What is interrupt? Explain different interrupts of 8051. Also write Interrupt vector table. (10 Marks)
- b. With a neat sketch, explain the bit configuration of IE register. (04 Marks)
- c. Show the instruction to
- enable serial interrupt timer 0 interrupt and external hardware interrupt, (EXO)
 - Disable the timer 0 interrupt
 - Show how to disable all the interrupt with single instruction. (06 Marks)

Module-5

- 9 a. With a neat figure, explain the different pins of LCD display and illustrate how to interface it to 8051 microcontroller. (10 Marks)
- b. A switch is connected to pin P2.7. Write a program to monitor the status of SW and perform the following.
- If SW = 0, the stepper motor moves clockwise
 - If SW = 1, the stepper motor moves counter clockwise. (10 Marks)

OR

- 10 a. What is DC motor? A switch is connected to pin P2.7. Write an ALP to monitor the status of SW. If SW = 0, DC motor moves clockwise and if SW = 1, DC motor moves anticlockwise. (10 Marks)
- b. With a neat flow chart illustrate 4 × 4 keyboard interfacing with 8051 microcontroller. Explain different steps involved to detect the key pressed. (10 Marks)
