

CBCS SCHEME

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15MT43

Fourth Semester B.E. Degree Examination, June/July 2018 Microcontrollers

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Explain the architecture of 8051 with neat block diagram. (08 Marks)
b. Explain the significance of program status word. Briefly discuss PSW registers of 8051. (08 Marks)

OR

- 2 a. With neat diagrams explain program memory and data memory of 8051. (08 Marks)
b. Distinguish between microcontroller and microprocessor. (04 Marks)
c. Explain the function of the following pins of 8051:
(i) \overline{EA} (ii) ALE (iii) RST (iv) \overline{PSEN} (04 Marks)

Module-2

- 3 a. Define addressing modes? Explain different addressing modes involved in assembly language program. (08 Marks)
b. Explain arithmetic instructions of 8051 microcontroller with examples. (08 Marks)

OR

- 4 a. Explain the different types of conditional and unconditional jumps instruction of 8051. Specify the different range associated with jump instruction. (08 Marks)
b. Explain the following instruction of 8051 with examples:
(i) XCHD A, @R₁
(ii) SWAP A
(iii) DA A
(iv) RL A (08 Marks)

Module-3

- 5 a. Explain C data types for 8051 with their data size in bits and data range. (08 Marks)
b. Explain TMOD and TCON registers with its bit pattern. (08 Marks)

OR

- 6 a. Write an 8051 C program to convert ASCII digits of '4' and '7' to packed BCD and display them on P₁. (04 Marks)
b. Write an 8051 C program to toggle all the bits of P₀, P₁ and P₂ continuously with a 250 ms delay. Use the EX-OR operator. (08 Marks)
c. What are the differences between timer and counter. (04 Marks)

Module-4

- 7 a. Discuss the different handshake signals of RS-232. Also explain the need serial communication with a block diagram. (08 Marks)
b. Mention the significance of RI and TI flag. (08 Marks)

OR

- 8 a. Explain the interrupts of 8051 clearly mentioning the vector address and priorities. (08 Marks)
b. What is baud rate? Which timer of the 8051 is used to set the baud rate? (04 Marks)
c. Explain the various modes of serial communication operation. (04 Marks)

Module-5

- 9 a. With a neat sketch and flowchart, explain how to interface a keypad to 8051 microcontroller. (08 Marks)
b. Explain the different pins of LCD. Also write an ALP to display message "Hello" on LCD. (08 Marks)

OR

- 10 a. With necessary diagram, explain the interfacing of stepper motor to 8051 and write an assembly level program to rotate motor clockwise for 180° rotation. (08 Marks)
b. Write a C program to generate a sine wave DAC. (08 Marks)

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