

# CBCS SCHEME

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17EC563

## Fifth Semester B.E. Degree Examination, Jan./Feb. 2021 8051 Microcontroller

Time: 3 hrs.

Max. Marks: 100

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

### Module-1

- 1 a. Differentiate between Microprocessor and Microcontroller with respect to their architecture and instructions. (06 Marks)
- b. Explain the Oscillator circuit and machine cycle of 8051 Microcontroller. (06 Marks)
- c. Explain the Internal Memory Organization in 8051. (08 Marks)

**OR**

- 2 a. With a neat block diagram, explain the architecture of 8051 Microcontroller. (10 Marks)
- b. Write the circuit diagram for Part – 1. Explain the input, output operations in 8051 using Part – 1. (10 Marks)

### Module-2

- 3 a. Explain the different addressing mode of 8051. Give an example for each one of them. (10 Marks)
- b. Explain the following instructions with examples :  
i) SJMP reL    ii) DA A    iii) CJNE destination , source , reL  
iv) SWAP A    v) DJNZ Rn , ReL. (10 Marks)

**OR**

- 4 a. Explain Data transfer instructions with examples. (10 Marks)
- b. Explain byte and bit level logical AND Operation with example. (05 Marks)
- c. Write an ALP to verify whether the data present in Accumulator is odd/even if odd store 00H in R0 register. Otherwise store FFH in R0 register. (05 Marks)

### Module-3

- 5 a. Write an ALP to find the smallest number of an array of N – 8 bit unsigned numbers. (08 Marks)
- b. Write an ALP to arrange the Numbers in Ascending order. (08 Marks)
- c. Write an ALP to rotate the contents of A to the left by one position with carry. (04 Marks)

**OR**

- 6 a. Write a program to move block of data from Internal data memory to External data memory location. (10 Marks)
- b. Write a program to find the factorial of a number. (05 Marks)
- c. Write a program to count the numbers of 1's and 0's in 8 – bit data. (05 Marks)

### Module-4

- 7 a. What is the difference between timer and counter? (02 Marks)
- b. Explain the functions of each bit in the TMOD and TCON register. (08 Marks)
- c. Write an ALP to generate square wave on Pin P1.5 of 500Hz (approximately) with using timer 0 , mode 1. Assume that crystal frequency of 8051 is 11.0592 MHz. (10 Marks)

OR

- 8 a. Explain Full duplex, Half duplex and Simplex serial data transfer. (06 Marks)  
 b. Write the steps required for programming 8051 to transfer data serially. (06 Marks)  
 c. Write an 8051 C program to transfer the message "YES" serially at 9600 baud , 8 – bit data 1 – stop bit do this continuously. (08 Marks)

Module-5

- 9 a. Explain the function of each bit in the (IE) Interrupt Enable register. (08 Marks)  
 b. Define Interrupt. List the various interrupts of the 8051. (08 Marks)  
 c. Bring out the difference between Interrupt and Pooling. (04 Marks)

OR

- 10 a. A switch is connected to Pin P2.5 and a stepper motor to Port 1. Write a program to monitor the status as of switching and  
 if Sw = 0 , Stepper motor rotate clockwise,  
 if Sw = 1 , Stepper motor rotate Anti clockwise continuously. (10 Marks)  
 b. Discuss interfacing of ADC 0804 with 8051 using timing diagram for ADC. (10 Marks)

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