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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 : (10 Marks)
 - i) SJMP reL ii) DA A iii) CJNE destination , source , reL
 - iv) SWAP A v) DJNZ Rn , ReL.

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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