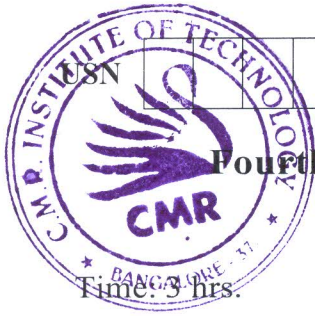


# CBCS SCHEME



18EC46

## Fourth Semester B.E. Degree Examination, June/July 2024 Microcontroller

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. (04 Marks)
- b. With a neat diagram, discuss the architectural features of 8051 Microcontroller. (08 Marks)
- c. Discuss the internal RAM structure of 8051 Microcontroller. (08 Marks)

OR

- 2 a. Explain the pin description of 8051 Microcontroller. (08 Marks)
- b. Interface 4K bytes ROM and 8K bytes RAM to 8051 Microcontroller in such a way that starting address of ROM is 1000 H and RAM is C000 H. (08 Marks)
- c. Define embedded system systems. Mention its applications. (04 Marks)

### Module-2

- 3 a. Explain any five different addressing modes with an example. (10 Marks)
- b. Show the status of CY, AC and P flags after execution of following instructions:  
MOV A, #9C H  
ADD A, #64 H (06 Marks)
- c. Write an ALP to convert a packed BCD to unpacked BCD number. (04 Marks)

OR

- 4 a. Discuss PUSH and POP instructions with an example. (06 Marks)
- b. Explain the following instructions mentioning their addressing mode and byte size.  
(i) MOVC A, @A + PC (ii) DA A (06 Marks)
- c. Write an ALP to find whether the given number is even or odd, and store the result at 50 H and 51 H internal RAM location. (08 Marks)

### Module-3

- 5 a. Discuss two instructions used to call subroutines with their ranges and write the significance of stack with respect to all instructions. (06 Marks)
- b. Write an assembly language program to sort an array of n = 5 byte of data in descending order stored from location 30 h (Use bubble sort algorithm). (08 Marks)
- c. Write an assembly language program to count the number of 1's and 0's in an 8-bit data received from port P1. Store the count of 1's and 0's in 30H and 31H. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and/or equations written eg, 42+8 = 50, will be treated as malpractice.

OR

- 6 a. Write an ALP to find factorial of an 8-bit number N. Assume value of N does not exceed 8-bit. (06 Marks)
- b. Write an ALP to read switch given in Fig.Q6(b), if switch is closed turn ON the LED else turn OFF the LED.

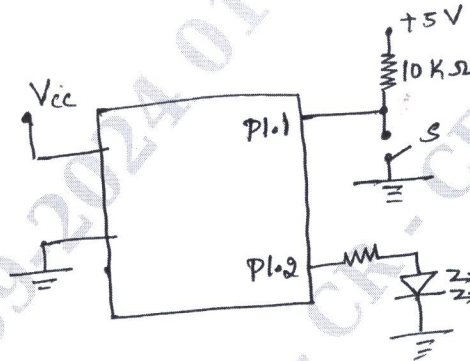


Fig.Q6(b)

(08 Marks)

- c. Define subroutine. Differentiate between CALL and JUMP. (06 Marks)

**Module-4**

- 7 a. Explain the bit contents of TCON and TMOD registers. (08 Marks)
- b. Explain the importance of RI and TI flag of 8051 Microcontroller. (04 Marks)
- c. Write an ALP to create a pulse width of 50 ms on P2.3 using Timer 0 operating in Mode 1. Assume crystal frequency = 11.0592 MHz. (08 Marks)

OR

- 8 a. Write an ALP to generate a square wave of frequency 2 kHz on P1.3 using Timer 0 in mode 2. Assume crystal frequency = 12 MHz. (10 Marks)
- b. Write an 8051 assembly language program to interface stepper motor to rotate in clockwise direction in Port 1. (10 Marks)

**Module-5**

- 9 a. With a bit pattern, explain IE register. Explain how interrupt priority can be changed using IP register. (10 Marks)
- b. With a diagram, explain 8051 interface with ADC. Write an assembly level code to interface ADC 0804 to 8051 Microcontroller. (10 Marks)

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OR

- 10 a. Explain stepper motor interface with a microcontroller. Write assembly level code to run stepper motor continuously in clockwise direction. (10 Marks)
- b. Explain DAC interfaces with 8051 Microcontroller. Write a program to generate any waveform. (10 Marks)

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