CBCS SCHEME

18EC46

Fourth Semester B.E. Degree Examination, Feb./Mar. 2022
Microcontroller

Time: 3 hrs. Max. Marks: 100

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

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.

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Module-1

1 a. Analyze the architecture of Intel 8051 Microcontroller. **(08 Marks)**

b. Compare RISC and CISC architecture. **(04 Marks)**

c. Interface 4K ROM and 2K RAM with 8051 microcontroller with relative memory mapping. **(08 Marks)**

OR

2 a. Sketch the register organization of Intel 8051 and briefly explain. **(08 Marks)**

b. Compare microprocessor and microcontroller. **(04 Marks)**

c. What is the purpose of PSW register? How flags are affected? Give examples. **(08 Marks)**

Module-2

3 a. Briefly explain the arithmetic instructions of INTEL 8051 microcontroller. **(08 Marks)**

b. Explain four addressing modes with examples. **(04 Marks)**

c. Write assembly language programming to transfer a block of data from external RAM to internal RAM. **(08 Marks)**

OR

4 a. For 8051 microcontroller operated with 12MHz crystal frequency, solve the execution time for the following instructions.
i) DJNZ R_1, BACK
ii) MUL AB. **(08 Marks)**

b. Identify the addressing mode used in the following instructions :
i) ADD A, @R_0
ii) MOVC A, @A + PC
iii) CLR C
iv) SWAP A. **(04 Marks)**

c. Write assembly language program to convert 8-bit binary number to its equivalent BCD. **(08 Marks)**

Module-3

5 a. Examine how stack memory can be accessed using PUSH and POP instructions. **(08 Marks)**

b. Calculate the item taken to execute four machine cycle for the crystal frequency
i) 12MHz ii) 16MHz. **(04 Marks)**

c. Develop a subroutine to find the time delay of ½ second using 8051 to blink the LEDs connected to port 0, show the calculations and necessary steps used. **(08 Marks)**

OR

6 a. Write a note on subroutine using CALL and RET instructions. **(08 Marks)**

b. Develop assembly language program to load accumulator with the value 55H and complement the contents of accumulator 900 times. **(04 Marks)**

c. Write a subroutine to find the factorial of a given number. **(08 Marks)**

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Module-4

7 a. Explain the functions of each bit in the TMOD and SCON register. **(08 Marks)**

b. Write an 8051 C program to send binary counter values from OOH – FFH to port P1. **(04 Marks)**

c. Develop an 8051 C program to toggle bits of port 1 to turn OFF and ON LEDs connected to the port 1. **(08 Marks)**

OR

8 a. Anlyzee the structure of TCON register. **(08 Marks)**

b. Explain Full duplex, Half duplex and simplex serial data transfer. **(04 Marks)**

c. Write assembly language program to transfer "GOOD Luck" serially at 9600H band, 8 – bit data, 1 – slip bit. **(08 Marks)**

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Module-5

9 a. Explain different types of interrupts in 8051 microcontroller. **(08 Marks)**

b. Develop an 8051 assembly language program to flash the LED connected to port 2.0. **(04 Marks)**

c. Analyze how multiplexed 7 – segment display can be interfaced to 8051 microcontroller. **(08 Marks)**

OR

10 a. Assume that XTAL – 11.0592MHz. Write a program to generate a square wave of 2KHz frequency on pin $P_{1.5}$. **(08 Marks)**

b. Develop an 8051 C program to flash the LED connected to Port 1.0. **(04 Marks)**

c. Analyze interrupt control used in 8051 microcontroller. **(08 Marks)**

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