

USN

--	--	--	--	--	--	--	--	--	--

18EC46

Fourth Semester B.E. Degree Examination, Dec.2023/Jan.2024
Microcontroller

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. With a block diagram explain the architecture of 8051 microcontroller. (10 Marks)
 b. Explain when overflow, auxiliary and parity flag bit is set in 8051 Program Status Word (PSW) register. What will be the value of PSW after the execution of following instructions:

MOV A, #40H

MOV B, #3FH

ADD A, B

(10 Marks)

OR

- 2 a. Interface 8051 microcontroller with 4KB of ROM and 64KB of RAM. (10 Marks)
 b. With diagram explain the structure of RAM. (05 Marks)
 c. Explain Port0 pin configuration with a diagram. (05 Marks)

Module-2

- 3 a. What is an addressing mode? Explain the different types of addressing modes with an example each. (10 Marks)
 b. Explain the operation of following instructions with one example each:
 i) PUSH ii) XRL A, B iii) DIV A B (06 Marks)
 c. Write assembly level program to add the contents of A and B Register and store result in 50H location. (04 Marks)

OR

- 4 a. Explain conditional and unconditional Jump instruction with an example. (08 Marks)
 b. Check if the instructions given are valid or not. Write the reason and correct the invalid instruction.
 (i) MOV R₀, DPT R (ii) MOV A, @R_y
 (iii) MOV #20H, 30H (iv) MOV R₀, @R₁ (08 Marks)
 c. Write assembly level program to multiply the contents of A and B register and store result in 30H location. (04 Marks)

Module-3

- 5 a. What is a subroutine? Explain the advantages of a subroutine. What are the sequence of operations that takes place when call and return instructions are executed? (08 Marks)
 b. With a diagram explain stack structure and its operation. (07 Marks)
 c. Write assembly level program to check the position of switch connected to P_{0.0}. If the switch is ON turn on LED connected to P_{1.0}. (05 Marks)

OR

- 6 a. Explain PUSH and POP instructions with an example. (08 Marks)
b. Write assembly level program to add two numbers stored in locations 20H and 21H using stack instructions. (04 Marks)
c. Explain CALL and RET instructions. (08 Marks)

Module-4

- 7 a. With the bit pattern explain TMOD register. (08 Marks)
b. Explain autoreload mode of timer1. How to make timer1 work as a counter? (08 Marks)
c. Write assembly level program using autoreload mode of timer0 to generate a frequency of 10 kHz on P_{1.2}. (04 Marks)

OR

- 8 a. With a bit pattern explain TCON register. (08 Marks)
b. Explain bit pattern of SCON register. (08 Marks)
c. Explain the importance of MAX232IC in serial communication. (04 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 a assembly level code to interface ADC 0804 to 8051 microcontroller. (10 Marks)

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 interface with 8051 microcontroller. Write a program to generate any waveform. (10 Marks)

* * * * *