



CBCS SCHEME

18EE52

Fifth Semester B.E. Degree Examination, June/July 2023 Microcontroller

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. What is the need of stack memory in microcontroller? How stack is operated in 8051 microcontroller? (10 Marks)
- b. Explain the different addressing modes of 8051 with an example. (10 Marks)

OR

- 2 a. Describe the bit pattern of Program Status Word (PSW). (06 Marks)
- b. Explain the memory organization of 8051. (07 Marks)
- c. Discuss the working of 8051 microcontroller with the help of block diagram. (07 Marks)

Module-2

- 3 a. Explain the unconditional jump instruction with address range. (08 Marks)
- b. Describe the following instructions with an example for each:
(i) XCHD A, @R₀ (ii) MOVC A, @A + PC (iii) SWAPA
(iv) MOV A, @R₁ (v) DAA (vi) ADDC A, @R₀ (12 Marks)

OR

- 4 a. Write an assembly language program to convert ASCII number to BCD number. (05 Marks)
- b. Analyze the following instructions and write the comment line for each?
MOV A, #85H
RR A
XCH A, R₀
ADD A, R₀
SWAP A (05 Marks)
- c. Explain PUSH and POP instructions with an example. (10 Marks)

Module-3

- 5 a. Explain the different data types supported by 8051C microcontroller. (08 Marks)
- b. Describe the significance of TMOD instruction in detail. (08 Marks)
- c. Write a 8051 ALP program to complement bit P_{1.5} ON and OFF 10000 times. (04 Marks)

OR

- 6 a. Write an ALP to create a square wave of 100 Hz with a duty cycle of 80% on port 1. Use timer '0', and operate that timer 0 in mode 1. Assume crystal frequency as 12 MHz. (10 Marks)
- b. A switch is connected to PM P_{1.2}. Write on 8051 C program to monitor 'SW' and create the following frequencies on P_{1.7}.
SW = 0; 500 Hz
SW = 1; 750 Hz
Use timer 0, mode 1 for both of them. Assume crystal frequency as 11.0592 MHz. (10 Marks)

Module-4

- 7 a. Explain the importance of TI and RI flags. (04 Marks)
 b. Describe simplex, half duplex and full duplex serial data transfer. (06 Marks)
 c. Write a C program to transfer the message "EXAM" serially at 9600 baud rate, 8 bit data and one stop bit continuously. (10 Marks)

OR

- 8 a. What is an interrupt? List various interrupts with their corresponding vector address. (06 Marks)
 b. Write a program to retrieve the data serially and put them in P₀. Set the baud rate at 4800, 8-bit and one stop bit. (06 Marks)
 c. Explain the asynchronous serial communication and data frame format. (08 Marks)

Module-5

- 9 a. Explain the architecture and working of LCD. Draw its schematic diagram. (10 Marks)
 b. Explain the construction and working of stepper motor. Also explain two phase, 4-step stepping sequence, step angle and steps per revolution. (10 Marks)

OR

- 10 a. Explain the control word format of 8255 IC. Find the control word for following configurations: (12 Marks)
 (i) All ports of A, B and C are O/P ports (mode '0')
 (ii) PA = IN, PB = OUT, PCL = OUT and PCH = OUT
 b. Explain the steps to interface ADC 0808 to the 8051 microcontroller with interfacing diagram. (08 Marks)
