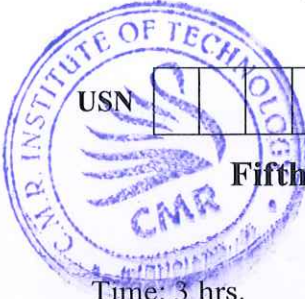


CBCS SCHEME

17EE52



USN

Fifth 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.

Module-1

- 1 a. List the differences between Microcontroller and Microprocessor. (06 Marks)
- b. Show the contents of the PSW Register after the execution of the following instructions.
(i) MOV A, #0BFH (ii) MOV A, #250
ADD A, #1BH ADD A, #50 (06 Marks)
- c. Explain the Pin diagram of 8051 microcontroller with a neat diagram. (08 Marks)

OR

- 2 a. Compare the RISC and CISC architectures. (04 Marks)
- b. Identify the addressing modes of the following instructions:
(i) MOV DPTR #ABCDH (ii) CJNE A, 40H, NEXT
(iii) PUSH 30H (iv) XRL A, @R0
(v) MOVC A, @A + DPTR (vi) DJNZ 30H, LOOP (06 Marks)
- c. Design an memory interface to connect 4 KB ROM memory using 74LS138 decoder with address space 4000H – 4FFFH. (10 Marks)

Module-2

- 3 a. Explain the following instructions:
(i) SUBB A, 30H (ii) CJNE A, 30H, BACK
(iii) RRL A (iv) XRL A, #78H (08 Marks)
- b. Find the delay in the following program for a 8051 system with crystal frequency of 22MHz
DELAY : MOV R2, #19
MOV R3, #255
AGAIN : DJNZ R3, AGAIN
DJNZ R2, HERE
RET (04 Marks)
- c. Write a program to find the SUM of 5 BCD numbers stored in RAM locations starting at 40H and the Result must be in BCD. (08 Marks)

OR

- 4 a. Write sequence of events that occur in 8051 microcontroller when the CALL and RET instructions are executed? (06 Marks)
- b. Write a program to add two 32-bit numbers stored in RAM locations 40H and 50H respectively and result must be stored from 60H location. (08 Marks)
- c. Write a program to check the status of SW connected to Pin P1.7 perform the following:
(i) If SW = 0, send letter "N" to P2
(ii) If SW = 1, send letter "Y" to P2 (06 Marks)

Module-3

- 5 a. Explain C data types for 8051 with data size in bits and data range. (06 Marks)
- b. Write an 8051 C program to get a byte of data from P0, if it is less than 100 send it to P1, otherwise send it to P2. (06 Marks)

- c. Write a program to generate a square wave on Pin 3.4 with ON time 4 msec and OFF time 3 msec using timer 0, mode 0 with crystal frequency of 22 MHz. (08 Marks)

OR

- 6 a. What are the different ways to create time delay in C? Discuss the factors affecting the accuracy of the time delay. (06 Marks)
- b. Write an 8051 C program to toggle all bits of port P₀ continuously use timer 0 to generate delay at 1 sec between each toggle. (06 Marks)
- c. Write a C program to send out the value 44H serially bit at a time via P_{1.0}. The LSB should go out first. (08 Marks)

Module-4

- 7 a. Explain asynchronous serial communication format. (04 Marks)
- b. Explain the importance of the RI and TI flag bits. (06 Marks)
- c. Write an 8051 C program to send two different strings to the serial port. A switch SW is connected to Pin 2.0 monitor its status and
If SW = 0 ; send your first name
If SW = 1 ; send your last name
Assume XTAL = 11.0592 MHz, baud rate of 9600 8-bit data, 1 stop bit continuously. (10 Marks)

OR

- 8 a. Compare Interrupts and Polling. List the various interrupts of the 8051 with their vector address. (06 Marks)
- b. Explain how to double the baud rate in the 8051. (04 Marks)
- c. Write a program to generate two square waves one on P_{1.3} of 5 KHz frequency and another on Pin P_{2.3} of frequency 25 KHz with XTAL 22 MHz. (10 Marks)

Module-5

- 9 a. Explain 8255 control word format for BSR and I/O modes (10 Marks)
- b. A switch is connected to Pin P_{2.3}. Write C program to monitor the status of SW and perform the following : (10 Marks)
- (i) If SW = 0 ; the stepper motor moves clockwise
- (ii) If SW = 1 ; the stepper motor moves counter clockwise

OR

- 10 a. Draw and explain the steps to interface ADC 0808 to the 8051 microcontroller. (10 Marks)
- b. Write an 8051 C program to display "HELLO" on the LCD connected to 8051. (10 Marks)
