



# CBCS SCHEME

17MT43

## Forth Semester B.E. Degree Examination, July/August 2021 Microcontrollers

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions.

- 1 a. Differentiate between RISE and CISE architecture. (06 Marks)  
b. Explain the bit configuration of PSW register. (06 Marks)  
c. Explain the salient features of 8051 microcontroller. (08 Marks)
- 2 a. Interface 16K EPROM and 8K RAM to 8051. (10 Marks)  
b. Explain Internal RAM memory organisation of 8051. (06 Marks)  
c. Explain the following : i) ALE ii)  $\overline{EA}$ . (04 Marks)
- 3 a. Define addressing modes. Explain different addressing modes with suitable example. (10 Marks)  
b. Explain the operation performed by the following instructions.  
i) DA A ii) MUL AB iii) CJNE iv) SETB C (10 Marks)
- 4 a. Assume the P1 is an input port connected to a temperature sensor. Write a program to read the temperature and test it for the value 75. According to the test results place the temperature value into the register indicated by the following : If  $T = 75$ , then  $A = 75$  if  $T < 75$  then  $R1 = T$ , if  $T > 75$  then  $R2 = T$ . (10 Marks)  
b. Assuming that ROM space starting at 250H contains "India" write a program to transfer the bytes in to RAM locations starting at 40H. (10 Marks)
- 5 a. Explain different data types in 8051 C with example. (10 Marks)  
b. Write an 8051 C program to convert a hexadecimal number FDH to decimal and display the digits on P0, P1 and P2. (05 Marks)  
c. Write an 8051 C program to calculate the check sum byte for the 4 bytes of hexadecimal data : 25H, 62H, 3FH and 52H. (05 Marks)
- 6 a. Explain the bit configuration of TMOD register and also write procedure for time delay generation using Timers. (10 Marks)  
b. Write a Assembly and 8051 C program to generate a square wave of frequency 10KHz on pin P1.4, use timer 0 in mode 2 with crystal frequency of 22MHz. (10 Marks)
- 7 a. Explain three modes of serial data transmission with a neat sketch. (06 Marks)  
b. With a neat sketch, explain the bit configuration of 500N register. (06 Marks)  
c. Write an ALP to send the text string "Hello" using serial data transmission, set the band rate at 9600, 8-bit data and 1 stop bit. Use T1. (08 Marks)
- 8 a. List and explain the different land shake signals of RS-232. Also mention the need for MAX-232 in serial data transmission. (10 Marks)  
b. Explain the importance of TI and RI flag. (10 Marks)

- 9 a. With a neat circuit, explain the interfacing of stepper motor with 8051. Also write a program to rotate a motor  $64^\circ$  in clock wise direction. The motor has a step angle of  $2^\circ$  use 4 step sequence and two coil excitation. (10 Marks)
- b. With a neat circuit diagram and flow chart explain how keypad is interfaced with microcontroller. Also explain the procedure used to detect the pressed key. (10 Marks)
- 10 a. Explain the pin description of LCD. Also write a program to display hello on LCD interfaced with microcontroller use delay method. (12 Marks)
- b. Write a C program to generate sine wave using DAC interfacing. (08 Marks)

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