



# CBCS SCHEME

15EE52

## Fifth Semester B.E. Degree Examination, Jan./Feb. 2021 Microcontroller

Time: 3 hrs.

Max. Marks: 80

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

### Module-1

- 1 a. With a neat block diagram, explain the function of each block of 8051 micro controller. (10 Marks)  
b. Explain the memory organization in 8051. (06 Marks)

OR

- 2 a. What is stack? Explain the instructions used to access them. (10 Marks)  
b. Explain the different addressing modes of 8051. Any three give an example for each of them. (06 Marks)

### Module-2

- 3 a. Explain the following instructions of 8051 with examples:  
i) XCHD A, @R<sub>i</sub> ii) MOVC A, @A+PC iii) RL A iv) MUL AB v) DA A. (10 Marks)  
b. What are assembler directives? Explain the functions of the assembler directives with an example for each. (06 Marks)

OR

- 4 a. Write 8051 ALP which checks whether the ten numbers stored from external RAM memory address, 2000H are odd/even. The program should store accordingly OOH/FFH from internal location 30H onwards. (10 Marks)  
b. Write an ALP to toggle all bits of port 1 every 200ms. Assume that the crystal frequency is 11.0592MHz of 8051. (06 Marks)

### Module-3

- 5 a. Write an 8051C program to read the content of port P<sub>1</sub>. If it is greater than 200, wait for 250msec and send the data to port P<sub>2</sub>. Otherwise wait for 150Msec and send the data to Port P<sub>0</sub>. (10 Marks)  
b. Discuss the data types in 8051C. (06 Marks)

OR

- 6 a. Write an assembly language program to generate 2kHz square wave on port 1.0 using timer 1, mode 1. Assume oscillator frequency of the  $\mu$ c is 12MHz. (10 Marks)  
b. Mention the difference between counter mode and timer mode of operation. With necessary format, explain the various bits of TMODSFR. (06 Marks)

### Module-4

- 7 a. Explain how 8051 transmits the character serially using its UART. (06 Marks)  
b. Write 8051 C program to transmit serially the message "SWITCH ON" or "SWITCH OFF" depending on the status of the simple switch connected to pin 1.2. Use 2400 baud rate, 1 stop bit, 8 data bit format and assume XTAL frequency as 11.0592 MHz. (10 Marks)

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.

OR

- 8 a. Explain the interrupts of 8051 clearly mentioning the vector address and priorities. (06 Marks)  
b. Write AL program that continuously gets 8 bit data from P<sub>0</sub> and sends it to P<sub>1</sub> while simultaneously creating a square wave of 200 $\mu$ s period on pin P2.1. Use timer 0, mode 2 to create the square wave. Assume that XTAL = 11.0592MHz. (10 Marks)

**Module-5**

- 9 a. Explain the features of ADC 0804. Also draw the pin diagram of the same mentioning the various pins. (06 Marks)  
b. Write a C program to rotate the stepper motor in the clock wise for 4 steps and in the antilock wise for 6 steps. Show the relevant calculations. (10 Marks)

OR

- 10 a. Draw the block diagram to show how 8051 is connected to DAC 0808 at port P<sub>1</sub>, using O/P buffer for DAC. Write an 8051 C program to generate a ramp signal (10 Marks)  
b. Explain the any two modes of operation of 8255 along with control word format. (06 Marks)

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