USN ☐☐☐☐☐☐☐☐☐☐   **15EC563**

Fifth Semester B.E. Degree Examination, Dec.2019/Jan.2020
8051 Microcontroller

Time: 3 hrs.   Max. Marks: 80

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

Module-1

1   a. Compare microprocessor and microcontroller.   (04 Marks)
    b. Explain the internal organization of 8051 microcontroller RAM. (04 Marks)
    c. Write the block diagram of 8051 and explain its features.   (08 Marks)

OR

2   a. Write bit pattern of PSW register and explain the conditional flags present in PSW.
                                                                        (04 Marks)
    b. How many SFR's present in 8051 and write the bit addressable SFR's present in 8051 with its address.   (04 Marks)
    c. Explain how $4K \times 8$ bit RAM and $8K \times 8$ EPROM can be interfaced to 8051 with necessary control signal.   (08 Marks)

Module-2

3   a. Write the any four addressing modes percent 8051 and explain each one of them with an example.   (08 Marks)
    b. Write a program to add the BCD numbers 99 and 85 present in RAM address 32 and 33. Store the BCD result in memory location 34 and 35. Also show how the BCD instruction works.   (08 Marks)

OR

4   a. Explain how MUL and DIV instruction works with an example in 8051 microcontroller.
                                                                        (08 Marks)
    b. Find the time required to execute the following instructions if AT 89C51 microcontroller is used :
        i)   ADDCA,#54 if XTAL frequency is 12MHz
        ii) XRL 35, # 47h if XTAL frequency is 11.0592
        iii) MULAB if XTAL frequency is 12 MHz
        iv) NOP if XTAL frequency is 11.0592MHz.   (04 Marks)
    c. Explain how the following instructions works with an example.
        i)   MOUX A, @ DPTR
        ii) MOVC A, @A + PC.   (04 Marks)

Module-3

5 a. What is stack and explain push and pop instruction works with an example. **(06 Marks)**

b. Calculate the delay produced in the program shown and XTAL used is of value 11.0592 MHz

```
        MOUR2, #250
100P NOP
     NOP
     NOP
     NOP
     DJN2 R2, 100P
     RET.
```
(05 Marks)

c. Write an ALP to read the number from P1 if it is odd find the compliment of the number and send it though P2 otherwise send it through P3. **(05 Marks)**

OR

6 a. Write an ALP to read the status of witch S connected to P1.2 if it is in the on condition switch on the LED connected P2.2 otherwise off LED connected P2.2. **(06 Marks)**

b. What is subroutine and mention the advantages of subroutine. **(05 Marks)**

c. Use subroutine to find the factorial of a number stored in memory location 45. Assume that the number stored in memory location is ≤ 05. **(05 Marks)**

Module-4

7 a. Explain TMOD and SCON register with its bit pattern. **(05 Marks)**

b. Write the steps to be followed for using timer1 in mode 2 and also find the value to be stored in reg. THI and get a delay of 100 µS when XTAL frequency is 11.0592MHz. **(05 Marks)**

c. Using time 0 write a program to generate a square wave on P1.4 of frequency of 2KHz in model. Assume XTAL frequency is 11.592MHz. **(06 Marks)**

OR

8 a. What are advantages of serial communication over parallel communication? **(05 Marks)**

b. Write a program to transfer the message 'HELLO' serially at 4800 baudrate with 1 stop bit. **(05 Marks)**

c. Write a C program for 8051 to transfer the letter 'V' serially at 9600 baud continuously use 8 bit data and 1 stop bit. **(06 Marks)**

Module-5

9 a. Explain the bit pattern of IE registrar and how (i) to enable the serial interrupt, time r0 interrupt and external hardware interrupt in 8051. **(04 Marks)**

b. Write a ALP that continuously gets 8 bit data from P0 and sends it to P1 while simultaneously creating a square wave of 200µs on pin 2.1 use timer 0 to create a square wave and XTAL frequency is 11.592MHz. **(06 Marks)**

c. Explain how TCON can be used in handling the interrupts and also indicate its bit pattern. **(06 Marks)**

OR

10 a. Write the name of the interrupt present in 8051 and also indicate the starting address reserved in ROM for each interrupt. **(05 Marks)**

b. Write a ALP to switch on LED connected on P1.3 for 500µsec when INT1 is activated. XTAL used 12MHz. **(06 Marks)**

c. Name the 14 pins present in LCD and show how it can be interfaced to microcontroller 8051 with P1 connected to data lines. **(05 Marks)**

* * * * *