USN | | | | | | | | | | **15EC563**

Fifth Semester B.E. Degree Examination, Dec.2017/Jan.2018
8051 Microcontroller

Time: 3 hrs.   Max. Marks: 80

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

Module-1

1   a.   Compare and contrast microprocessors and microcontrollers.   (04 Marks)
    b.   What does the term Embedded system mean?   (02 Marks)
    c.   Describe the hardware features of 8051 microcontrollers, with a neat internal block diagram.
                                                                             (10 Marks)

OR

2   a.   Briefly discuss the uses of A, B and PSW registers.   (06 Marks)
    b.   Show how to interface external PROM and external RAM to 8051. Explain how 8051 access them.   (10 Marks)

Module-2

3   a.   Explain any 4 data addressing modes of 8051 with an example for each mode.   (06 Marks)
    b.   Show the status of CY, AC and P flags after execution of following instructions
            MOV A, # 9 C H
            ADD A, # 64H.   (04 Marks)
    c.   Write a program to copy the value 55H into RAM location 40H to 45H using
            i) Direct addressing, without using loop.
            ii) Register indirect addressing, without using loop.   (06 Marks)

OR

4   a.   Discuss the three address ranges that are utilized by jump and call instructions.   (06 Marks)
    b.   Explain byte and bit level logical OR operation with examples.   (04 Marks)
    c.   Write an ALP to verify whether the data present in location 1000H is odd/even. If odd store 00H in location 2000H. Otherwise store EEH in 2000H.   (06 Marks)
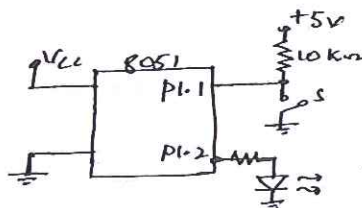
Module-3

5   a.   What are the benefits of subroutines?   (02 Marks)
    b.   Discuss two instructions used to call subroutines with their ranges and write the significance of stack with respect to all instructions.   (06 Marks)
    c.   Ten 8 - bit numbers are stored in RAM locations 40H onwards. Write an ALP to find the Largest number and store it in memory location 50H.   (08 Marks)

OR

6   a.   Write an ALP to read switch given in fig.Q6(a). if switch is closed turn ON the LED else turn OFF the LED.   (04 Marks)

Fig.Q6(a)

b. For an 8051 system of 11.0592 MHz. Find the time delay for the following subroutine
   Delay : MOV R3 , # 250   **(06 Marks)**
   Back : Nop
          Nop
          DJNZ R3 , BACK
          RET

c. Write an ALP to find factorial of an 8 – bit number N. Assume value of N! does not exceed 8 bit.   **(06 Marks)**

Module-4

7 a. Describe the various modes of operation of 8051 Timers.   **(04 Marks)**

    b. Write an ALP to create a pulse width of 50ms on P2.3 using Timer '0' operating in Mode 1. Assume crystal frequency = 11.0592 MHz.   **(06 Marks)**

    c. Write an ALP to generate a square wave of frequency 1KHz on P1.3 using Mode 2. Timer 0. Assume crystal frequency = 22MHz.   **(06 Marks)**

OR

8 a. List the advantages of serial data communication over parallel and explain briefly details of SCON register.   **(04 Marks)**

    b. Write an ALP to transfer a letter 'M' serially at 9600 baud rate continuous by through P3.1. Assume XTAL frequency as 11.0592MHz.   **(06 Marks)**

    c. Write an 8051 'C' program to receive data bytes serially and put them in P1. Set the baud rate at 4800, 8 bit data and 1 stop bit. Assume XTAL frequency as 11.0592 MHz. **(06 Marks)**

Module-5

9 a. Briefly explain the software interrupts of 8051.   **(04 Marks)**

    b. Discuss the role of TCON register in handling interrupts giving its bit details.   **(04 Marks)**

    c. Write a program using interrupts to get data from P1.0 and send it to P2.0, while timer '0' is generating a square wave of 4KHz, on P2.4. Assume XTAL frequency as 11.0592 MHz.
          (08 Marks)

OR

10 a. A switch is connected to pin P2.7 and a stepper motor to port 1. Write a program to monitor the status as of switching and
   If SW = 0, stepper motor should rotate clock wise, continuously.
   If SW = 1, stepper motor should rotate anti clock wise, continuously.   **(08 Marks)**

    b. Interface ADC-0804 to 8051 and write an ALP to convert the analog input to digital value.   **(08 Marks)**

* * * * *