USN

17EC563

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

Time: 3 hrs.

Max. Marks: 100

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

Module-1

1 a. Write the comparison between Microprocessor and Microcontroller. **(05 Marks)**
   b. Define Embedded System and write the characteristics of an Embedded System. **(05 Marks)**
   c. Write and explain the Architecture of 8051 Microcontroller and also explain the PSW, RAM memory organization. **(10 Marks)**

OR

2 a. Write and explain the pin diagram of 8051 Microcontroller. **(10 Marks)**
   b. Explain the Interfacing of 16K EPROM and 8K RAM to 8051 Microcontroller. **(10 Marks)**

Module-2

3 a. Write and explain the Addressing modes of 8051 Microcontroller with an example.
   (10 Marks)

   b. Explain the following instructions with an example:
   (i)   DJNZ R_n, rel
   (ii) MOVC A, @A+DPTR
   (iii) RRC A
   (iv) PUSH 02
   (v)   DAA
   (10 Marks)

OR

4 a. Explain Call and Jump Instructions. **(06 Marks)**
   b. Explain any four directives. **(04 Marks)**
   c. Write and explain an Assembly Language Program to divide the data in RAM location in 38H by data in 15H and store the quotient in 70H and remainder in 71H. **(10 Marks)**

Module-3

5 a. Write and explain an Assembly Language Program to transfer five 8-bit of data from starting memory location 30H to other memory starting at 40H. **(08 Marks)**
   b. Write and explain an Assembly Language Program to find largest 8-bit number form the given five 8-bit numbers. **(08 Marks)**
   c. Write and explain an Assembly Language Program to toggle all the bits of port 1, with a time delay between toggling. **(04 Marks)**

OR

6 a. Write and explain an Assembly Language Program to read the lower nibble of data by P_0 is to be displayed on LEDS are connected to upper 4-bits of P_1. **(10 Marks)**
   b. Write and explain an Assembly Language Program to Add two 32-bit numbers. The numbers are stored from RAM location 40H and 50H respectively. Store the result from RAM location 60H. **(10 Marks)**

Module-4

7 a. Explain TMOD and TCON registers. **(08 Marks)**

b. Write and explain an Assembly language program to toggle $P_{1.5}$ every 1 second. Use Timer1 in mode1. Assume crystal oscillator frequency is 11.0592 MHz. **(08 Marks)**

c. Explain SCON register. **(04 Marks)**

OR

8 a. Write and explain a C program and assembly to generate a square wave of frequency 10 kHz on Pin 1.4. Use timer0 in mode2 with a crystal frequency of 22 MHz. **(10 Marks)**

b. Write and explain a C program and assembly to transfer "VTU" serially with a baud rate of 9600. Assume crystal oscillator frequency is 11.0592 MHz. **(10 Marks)**

Module-5

9 a. Explain IE register. **(04 Marks)**

b. Write and explain a C program and assembly to generate a square wave on $P_{2.4}$ with high of 1 ms and low portion of 2 ms using timer1 in interrupt mode with a crystal oscillator frequency of 11.0592 MHz and also read the value of port0 and display is on port1. **(08 Marks)**

c. Write and explain an assembly language program to do the following:
(i)   Reads data from port P_1 and writes it to P_2 continuously.
(ii) Also the data at P_1 is transferred serially.
(iii) The data received serially is displayed at P_0.
Assume 11.0592 MHz crystal frequency 9600 baud rate. **(08 Marks)**

OR

10 a. Write and explain a C program and assembly to interface an ADC 0804 to 8051 Microcontroller and display on P_2. **(10 Marks)**

b. Write and explain a C program and assembly to monitor the status of a switch SW connected to Pin P2.7 and perform the following:
(i) If SW = 0, the stepper motor rotates clockwise.
(ii) If SW = 1, the stepper motor rotates in anticlockwise.
Use the wave-drive 4-step sequence. **(10 Marks)**

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