CBCS SCHEME

USN

17EC563

Fifth Semester B.E. Degree Examination, Aug./Sept.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. Explain the architecture of 8051 with necessary diagram. **(08 Marks)**
b. Write the internal RAM division of 8051 and explain how it can be used. **(06 Marks)**
c. Compare microprocessor with microcontroller. **(06 Marks)**

OR

2 a. Draw the diagram to show how 4K ROM and 8K RAM can be interfaced to 8051 microcontroller and explain. **(08 Marks)**
b. Explain the PSW of 8051 microcontroller. **(06 Marks)**
c. Mention the alternate functions of PORT 3 in 8051 microcontroller. **(06 Marks)**

Module-2

3 a. Mention the four addressing modes used in 8051 microcontroller and explain each one of them with an example. **(08 Marks)**
b. What is bit level logical operation and explain the bit level instructions which affect the carry flag. **(06 Marks)**
c. Write an assembly level program to add two numbers present in external memory location 8000h and 9000h of 8051 microcontroller store the 16 bit result obtained in reg A and B with MSB of the result in reg A. **(06 Marks)**

OR

4 a. Draw a figure to indicate the relative range of all the jump instructions. Also explain bit jump instruction present in 8051 microcontroller. **(08 Marks)**
b. Explain rotate instructions available in 8051 micro controller with an example to understand its working. **(06 Marks)**
c. Write a program to exchange the contents of reg.R0 in bank0 with the contents of reg.R5 in bank2 using PUSH and POP instructions. Assume that the SP is starting from 20h. **(06 Marks)**

Module-3

5 a. What is the use of stack in 8051 microcontroller and explain the instructions used to move and retrieve the data from stack with an example. **(06 Marks)**
b. Find the time required to execute the following instructions using 8051 microcontroller.
(i) MOUR3, #55; crystal frequency is 11.0592 MHz
(ii) DJN2 R2, target; crystal frequency is 20 MHz
(iii) MULAB; crystal frequency is 16 MHz **(06 Marks)**
c. Write an assembly level program for 8051 microcontroller to find the factorial of an 8 bit number. Assume the result obtained in maximum of 8 bits only. **(08 Marks)**

OR

6 a. Write the sequence of events that happens on execution of CALL and RET instructions with necessary diagram. **(06 Marks)**

b. A switch is connected to microcontroller 8051 as shown in Fig.Q6(b). If switch is closed then switch on LED1 else switch on LED2. Write a program for the above requirement. Glow the LED for 100 μs XTAL = 11.0592 MHz.

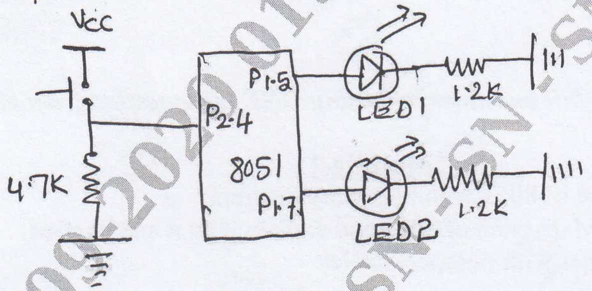

Fig.Q6(b) **(06 Marks)**

c. Write an assembly level program to find the smallest of the 05 numbers stored in consecutive memory location in internal RAM starting from 100 h and store the result in accumulator. **(08 Marks)**

Module-4

7 a. Indicate the bits present in TMOD register and explain its uses. **(06 Marks)**

b. Write the steps to program in MODE2 timer 01. Also find the frequency of square wave generated with duty cycle of 50% if TH1 is set to 05 when used in timer0 in mode 2. Given XTAL = 11.0592 MHz. **(06 Marks)**

c. Write an assembly level program to generate a square wave on $P_{1.2}$ with 50% duty cycle. Find the frequency of the square wave generated if timer0 is used in MODE1 in the above program if TH0 = 00 and TL0 = 00 and also the crystal frequency used is 11.0592 MHz. **(08 Marks)**

OR

8 a. Indicate the bits present in SCON register and explain its uses. **(06 Marks)**

b. Write the steps used to transfer the data serially in 8051 microcontroller. **(06 Marks)**

c. Write an 8051 program to transfer the message "VTU" serially at 9600 baud, 8 bit data continuously. **(08 Marks)**

Module-5

9 a. Explain IE register and TCON register of 8051 microcontroller. **(06 Marks)**

b. List the interrupt priority upon reset on 8051 microcontroller and how the highest priority can be given to serial communication after reset. **(06 Marks)**

c. Write a program to generate a square wave of 50 Hz on $P_{1.2}$ using interrupt with 50% duty cycle. Assume XTAL = 11.0592 MHz. **(08 Marks)**

OR

10 a. Explain the various pins present in ADC0804. **(10 Marks)**

b. Write the various pins present in LCD and also indicate how LCD can be interfaced to 8051 microcontroller to check the status of the busy flag. **(10 Marks)**

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