USN

18EE52

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

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. Draw and explain the architecture of 8051 microcontroller. **(08 Marks)**
b. Compare the microprocessor and microcontroller. **(06 Marks)**
c. Explain with the help of diagram, how to interface external code memory to 8051 microcontroller. **(06 Marks)**

OR

2 a. Describe the functions of various pins of 8051 microcontroller with pin diagram. **(08 Marks)**
b. Explain the various addressing modes of 8051 microcontroller examples. **(08 Marks)**
c. List and explain the criteria for choosing a microcontroller. **(04 Marks)**

Module-2

3 a. Define assembler directives. Explain the assembler directives of 8051 micronctroller with examples. **(08 Marks)**
b. Write a program to load the accumulator with the value 55H and complement the ACC 700 times. **(06 Marks)**
c. Write a program to count positive and negative numbers in a given array. **(06 Marks)**

OR

4 a. Explain the operation performed by the following instructions with examples.
i) DJNZ R1, rel ii) DA A iii) MOVX A, @ DPTR iv) SWAP A. **(08 Marks)**
b. Write a program to find factorial of a number. **(06 Marks)**
c. Write an assembly language program to toggle the bits of port P1. **(06 Marks)**

Module-3

5 a. Write 8051 program to generate square wave with t_{ON} = 3ms and t_{OFF} = 10ms an all pins of port 0. **(08 Marks)**
b. Explain the bit structure of TMOD register. **(06 Marks)**
c. Write an 8051 C program to convert FD hex to decimal and display the digits on P0, P1 and P2. **(06 Marks)**

OR

6 a. Explain Mode – 2 programming of 8051 timer. Describe the different steps to program in Mod 2. **(08 Marks)**
b. Write a 8051 C program to bring in a byte of data serially one bit at a time Via P2.0. The LSB should come in first. **(06 Marks)**
c. Write a 8051 C program to toggle all the bites of port P2 continuously with some delay in between. Use Timer 0, 16 bit mode to generate the delay. **(06 Marks)**

Module-4

7 a. Compare Interrupt and Polling. Explain the steps in executing an interrupt. (08 Marks)

b. Write an 8051 C program to transfer the message "YES" serially at 9600 baud, 8 bit data, 1 stop bit. Do this continuously. (06 Marks)

c. Explain the importance of TI and RI flags. (06 Marks)

OR

8 a. Explain the bit constants of SCON and PCON registers. (08 Marks)

b. Explain the various handshaking signals of RS232 communication standard. (06 Marks)

c. Write a 8051 C program using interrupts to generate 10000 Hz frequency on P2.1 using To 8 bit auto reload and also use Timer 1 as event counter to count up 1Hz pulse and display on P0. Pulse is connected to Ex1. Assume XTAL = 11.0592MHz. Baud rate = 9600. (06 Marks)

Module-5

9 a. Interface LCD to 8051 microcontroller and write an 8051 assembly/8051 C program to send VTU to LCD display using busy flag. (08 Marks)

b. Write an ALP to rotate stepper motor continuously. (06 Marks)

c. Explain the block diagram of 8255 chip. (06 Marks)

OR

10 a. Explain the H-Bridge configuration of DC motor and also show interfacing of 8051 microcontroller with DC motor through opto isolator. (08 Marks)

b. Show interfacing between 8051 microcontroller and keyboard and explain scanning and indentifying the key pressed. (06 Marks)

c. Explain the 8051 microcontroller interfacing to ADC. (06 Marks)

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