USN ☐☐☐☐☐☐☐☐☐☐   **18EE52**

Fifth Semester B.E. Degree Examination, June/July 2024
Microcontroller

Time: 3 hrs.   Max. Marks: 100

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

Module-1

1   a. With a neat block diagram, explain the functions of each block of 8051 Microcontroller. **(10 Marks)**
   b. Draw and explain 8051 connection to Interface External RAM and External ROM. **(10 Marks)**

OR

2   a. Write the features of Microcontroller. **(06 Marks)**
   b. With an example, explain addressing modes of 8051 Microcontroller. **(08 Marks)**
   c. Explain the PSW and flag bits. **(06 Marks)**

Module-2

3   a. What are assembler directives? Explain the functions of the assembler directives with an example for each. **(06 Marks)**
   b. Explain the following instructions:
     (i) MUL AB   (ii) DA A   (iii) MOV C A, @A + DPTR
     (iv) LJMP label   (v) SWAP A   **(10 Marks)**
   c. Explain Jump and CALL instruction. **(04 Marks)**

OR

4   a. Write an 8051 assembly program to find average of five numbers stored starting from internal data memory address 40 + 1. **(08 Marks)**
   b. Write a program to complement the contents of accumulator 700 times. **(06 Marks)**
   c. Explain with an example of instructions:
     (i) ANL A, add   (ii) XRL A, @ Rp   (iii) SUBB A, Rr   **(06 Marks)**

Module-3

5   a. Explain the different data types supported by 8051C Microcontroller. **(08 Marks)**
   b. Write an 8051C program to toggle the bits of P_1 ports continuously with a 250 MS delay. **(06 Marks)**
   c. Write an 8051 C program to convert packed BCD to ASCII and display the bytes on P_1 and P_2. **(06 Marks)**

OR

6   a. Explain TMOD Register. **(06 Marks)**
   b. Find the values of TMOD to operate as time is in the following modes:
     (i)   Mode 1, Timer 1
     (ii)   Mode 2, Timer 0, Mode 2 Timer 1
     (iii)   Mode 0, Timer 1   **(06 Marks)**
   c. Write an 8051 C program to toggle all the bits of port P_1 continuously with some delay in between. Use Timer-0, 16-bit mode to generate the delay. **(08 Marks)**

Module-4

7 a. Explain simplex, half duplex and free duplex. **(06 Marks)**
   b. Explain how 8051 transmits the character serially using its UART. **(06 Marks)**
   c. Write a C program for the 8051 to transfer the letter 'c' serially at 9600 band continuously, use 8-bit data and 1 stop bit. **(08 Marks)**

OR

8 a. Explain different interrupts of 8051 indicating their vector address. **(06 Marks)**
   b. Write an 8051 C program to transfer the message 'ELECTRICAL' serially at 9600 band rate, 8-bit data, 1-stop bit. **(08 Marks)**
   c. Explain the bit status of SCON register. **(06 Marks)**

Module-5

9 a. Explain the architecture and working of 14 pin LCD. Draw the Interface diagram of LCD with 8051 Microcontroller. **(10 Marks)**
   b. Explain with neat diagram of interfacing of DC motor with 8051. **(10 Marks)**

OR

10 a. A switch is connected to pin P2.7. Write a C program to monitor the status of SW and perform the following:
   (i)   If SW = 0 ; The stepper motor moves clockwise.
   (ii) If SW = 1; The stepper motor moves counter clockwise. **(08 Marks)**
   b. Explain the pin diagram of 8255. **(06 Marks)**
   c. Draw the block schematic of DAC 0808 Interfaced to 8051. **(06 Marks)**

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