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21MT44

Fourth Semester B.E. Degree Examination, June/July 2023
Microcontrollers and Applications

Time: 3 hrs.   Max. Marks: 100

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

Module-1

1 a. Discriminate between microprocessor and microcontroller.   (04 Marks)
   b. Summarize the functions of various pins of 8051 microcontroller with PIN diagram.
                                                                              (08 Marks)
   c. Brief all the Register used in 8051.   (08 Marks)

OR

2 a. Describe Harward and Vonneuman CPU Architecture.   (04 Marks)
   b. Explain how memory is organized in 8051 micro-control in detail.   (08 Marks)
   c. Illustrate the oscillator ckt and execution timing of 8051 Microcontroller. (08 Marks)

Module-2

3 a. Explain the different Addressing modes of 8051. Give an example for such one of them.
                                                                              (08 Marks)
   b. Describe how stack implemented in 8051.   (04 Marks)
   c. Mention the function of the following Instruction of 8051 cpu.
      i) MOV CA, @ A + DPTR   ii) CJNE   iii) DJNZ   iv) ACALL.   (08 Marks)

OR

4 a. List out and explain different assembler directive used in ALP.   (04 Marks)
   b. Write a program to MOV a block of data which is stored in internal location to another
      internal memory location.   (08 Marks)
   c. Explain JUMP and CALL instruction with a neat diagram, explain the range of JUMP and
      CALL instruction.   (08 Marks)

Module-3

5 a. Explain different modes of operation of timer/counter with relevant block diagram. (08 Marks)
   b. Write an 8051 C program to toggle only PIN P1.0 continuously every 500ms. (08 Marks)
   c. Describe the bits of TCON Register.   (04 Marks)

OR

6 a. Explain the timer structure of 8051 with TMOD register.   (08 Marks)
   b. Write an 8051 C program to toggle all bits of port P_0 continuously. Use timer 0 Generate
      delay of 1 Sec between each toggle.   (08 Marks)
   c. Find the delay Generated by timer 0 in the following code. Calculate the delay generated
      excluding the instruction overhead. What count has to be loaded in TLO and THO if delay
      has to be increased to 25m Sec

      CLR P 2.3   SETB JF0,
      HERE TMOD, H01   AGAIN : JNBJF0, AGAIN
           MOVTL0, #3EH   CLRTF0
           MOVTH0, # OB8h   CLRTR0
                                  CLRP2.3   (04 Marks)

Module-4

7 a. Define serial communication? How serial communication is carried out with RS232 in 8051. **(08 Marks)**

b. Describe full Duplex, Half Duplex and simple serial data transfer. **(08 Marks)**

c. Explain bit pattern of PCON Register. **(04 Marks)**

OR

8 a. Distinguish between synchronous and asynchronous communication. **(04 Marks)**

b. Describe the Role of RS232 in serial communication. **(08 Marks)**

c. Write an assembly language program to transfer the message 'Good luck' serially at 9600 baud, 8 bit data. **(08 Marks)**

Module-5

9 a. With neat sketch describe how LED can be interfaced to 8051 **(04 Marks)**

b. Interface 4 digit 7 segment LED display to 8051 and with ALP to display 1234 on it. **(08 Marks)**

c. Summarize with diagram how LCD interfaced to 8051. **(08 Marks)**

OR

10 a. Explain the operation of ADC 804 interfacing with ALP to 8051. **(04 Marks)**

b. Interface stepper motor to 8051 microcontroller and write ALP to rotate it 180°. **(08 Marks)**

c. What is PWM? How it is used to control the speed of DC Motor. **(08 Marks)**

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