15EE52

Fifth Semester B.E. Degree Examination, Aug./Sept.2020
Microcontroller

Time: 3 hrs.   Max. Marks: 80

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

Module-1

1 a. Sketch PSW register. Also, explain its flag bits.   **(06 Marks)**
   b. Explain any four addressing modes of 8051 with examples.   **(06 Marks)**
   c. With a neat block diagram, explain the RAM memory space allocation in the 8051.
                                                                                  (04 Marks)

OR

2 a. With a neat block diagram, explain the various features of 8051 microcontroller.   **(08 Marks)**
   b. What are stack? Explain the PUSH and POP Instructions with examples.   **(06 Marks)**
   c. What are SFR'S? List any four bit and byte SFR'S and their addresses.   **(02 Marks)**

Module-2

3 a. Define assembler directives. Explain the functions of various assembler directives in 8051
      Microcontroller.   **(06 Marks)**
   b. Explain the following instructions:
      (i) Div AB   (ii) DA A   (iii) SWAP A   (iv) MOVC A, @A+DPTR   **(06 Marks)**
   c. Write an assembly language program to convert packed BCD number to two ASCII
      Numbers.   **(04 Marks)**

OR

4 a. Explain the different types of conditional and unconditional jump instructions of 8051.
                                                                                  (06 Marks)
   b. Write an ALP to check if the character string of length 5, stored in RAM locations 50 H
      onwards is a palindrome, if it is palindrome, display output character 'Y' to port P1.
                                                                                  (06 Marks)
   c. Classify the CALL Instruction in 8051. Explain each one.   **(04 Marks)**

Module-3

5 a. Explain the bit status of TMOD register.   **(06 Marks)**
   b. Write an ALP to generate a square wave of frequency 1 kHz on pin P1.2 using Timer 0,
      Mode 2. Assume that crystal frequency of 8051 is 22 MHz.   **(06 Marks)**
   c. Explain different Data types in 8051C.   **(04 Marks)**

OR

6 a. A switch is connected to pin P1.2. Write an 8051C program to monitor SW and create the
      following frequencies on pin P1.7.
      SW = 0 ; 500 Hz
      SW = 1 ; 750 Hz
      Use timer 0, mode 1 for both of them.   **(06 Marks)**
   b. Write a C program for counter 0 in Mode 1 to count the pulses and display the THO and
      TLO registers on P2 and P1 respectively. Assume that a 1 Hz external clock is being fed in
      to pin P3.4.   **(06 Marks)**
   c. Explain the different logical operations supported by 8051 C.   **(04 Marks)**

Module-4

7 a. Explain the bit status of SCON special function register. **(06 Marks)**

   b. Write an 8051 C program to send two messages "Normal Speed" and "High Speed" to the serial port. Assuming that SW (Switch) is connected to pin P2.0, monitor its status and set the baud rate as follows:
   SW = 0 ; 28,800 baud rate
   SW = 1 ; 56K baud rate
   Assume that XTAL = 11.0592 MHz for both cases. **(06 Marks)**

   c. Explain the 9 pins of RS232. **(04 Marks)**

OR

8 a. Explain the different interrupts of 8051 along with their vector addresses. **(06 Marks)**

   b. Explain the activation of external hardware interrupts using level-triggered interrupt and edge triggered interrupt method. **(10 Marks)**

Module-5

9 a. Explain the various pins of ADC0808 chip with a pin diagram. **(08 Marks)**

   b. With a neat circuit diagram, explain the connection of 8051 to ADC 0848 and temperature sensor. **(08 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 **(06 Marks)**

   b. Draw a circuit DC motor connected using a Darlington transistor. **(04 Marks)**

   c. Explain the four modes of operation 8255 along with control word format. **(06 Marks)**

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