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06ES42

Fourth Semester B.E. Degree Examination, June/July 2016
Microcontrollers

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting atleast TWO questions from each part.***

PART – A

1 a. Differentiate between : i) Microprocessor and Microcontroller ii) RISC and CISC processor. **(08 Marks)**

b. With neat diagram, explain in detail the programming model of 8051. **(12 Marks)**

2 a. Explain the different addressing modes of 8051. Give an example for each one of them. **(08 Marks)**

b. Write a program to convert packed BCD number stored at 60h to two ASCII numbers and place them in 61h and 62h (with lower nibble ASCII value at 61h). **(06 Marks)**

c. Differentiate between the following instruction of 8051 microcontroller.
i) SWAP and XCHG.
ii) MOVX and MOVC.
iii) Bit level ANL and Byte level ANL. **(06 Marks)**

3 a. Explain the different types of JUMP instructions in 8051. **(08 Marks)**

b. On – chip ROM has a message. Write a program to copy it from code space into the upper memory space starting at address 80H. Also give a copy to Po at the same time. **(08 Marks)**

c. Explain with diagram how the stack is used in the case of a CALL (ACALL or LCALL) instruction. **(04 Marks)**

4 a. A door sensor is connected to P2.1 in and a buzzer is connected to P2.7. Write an 8051C program to monitor the door sensor and when it opens sound the buzzer. Buzzer is enabled by sending a square wave of 50Hz. **(08 Marks)**

b. Explain with an example, bit – wise logic operators for 8051C. **(06 Marks)**

c. Write a 8051C program to receive in a byte of data serially one bit at a time via P2.0. The LSB is read first. **(06 Marks)**

PART – B

5 a. Explain TMOD and TCON registers with its bit pattern. **(08 Marks)**

b. A 1-Hz external clock is being fed into pin To(P3.4). Write a C program for counter 0 in mode 1(16-bit) to count the pulses and display the THO and TLO registers on P_2 and P_1 respectively. **(06 Marks)**

c. Explain with the steps involved to program Timer in mode 2 with a relevant block diagram. **(06 Marks)**

6 a. What is Asynchronous serial communication and data framing? **(06 Marks)**

b. Write the steps required for programming 8051 to receive data serially. **(06 Marks)**

c. Write an 8051 C program to transfer the message "Exam" serially at 9600 based, 8 bit data, 1 stop bit serially continuously. **(08 Marks)**

7 a. Explain the six interrupts of 8051 with the priority and interrupt vector table. **(08 Marks)**

b. Write a 8051 'C' program using interrupts to do the following :

i) Receive data serially and send it to P0.

ii) Read port P1, transmit data serially and give a copy to P2.

iii) Make Timer 0 to generate a square wave of 200μs period on pin P0.1.

Assume that XTAL = 11.0592 MHz. Set the baud rate at 9600. **(12 Marks)**

8 a. Explain with a block diagram, step by step procedure involved to interface 4 × 4 matrix keyboard with 8051. **(10 Marks)**

b. A switch is connected to pinP2.7. Write a 8051 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. **(10 Marks)**

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