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17EC563

Fifth Semester B.E. Degree Examination, July/August 2021
8051 Microcontroller

Time: 3 hrs. Max. Marks: 100

Note: ***Answer any FIVE full questions.***

1 a. Explain the architecture of 8051 microcontroller with a neat diagram. **(10 Marks)**
b. Compare microprocessor and microcontroller. **(04 Marks)**
c. Explain the working of port 0 and port 1 with the help of necessary diagram. **(06 Marks)**

2 a. Show the internal memory organization of 8051. **(06 Marks)**
b. Explain the interfacing of external ROM and RAM to 8031 microcontroller with the help of a neat diagram. **(10 Marks)**
c. Explain the addressability and byte addressability with examples. **(04 Marks)**

3 a. Explain the different addressing modes with examples. **(08 Marks)**
b. Explain the following instructions with examples.
i) DJNZ R2, again ii) MOV A, 50h iii) INC R1 iv) DA A **(08 Marks)**
c. Write an ALP to add two 16-bit numbers. **(04 Marks)**

4 a. Write an ALP to transfer the data bytes 10h, 20h, 30h, 40h, 50h to memory locations 60h, 61h, 62h, 63h, 64h without using loops. **(08 Marks)**
b. Explain different rotate instructions with examples. **(08 Marks)**
c. Mention the flags of PSW and its applications in instructions. **(04 Marks)**

5 a. Explain the sequence of events when a call opcode occurs in the program and use of stack with necessary diagram. **(08 Marks)**
b. Write an ALP to find factional of an 8-bit number. The result should be maximum of 8-bit. **(06 Marks)**
c. Write an ALP to add first 10 natural numbers. **(06 Marks)**

6 a. Write an ALP to find smallest number in an array of 10 bytes from location 60h. **(10 Marks)**
b. Show different jump instructions in 8051 with diagram based on range. **(06 Marks)**
c. In the Fig Q6(c), write an ALP to turn on LED when switch is pressed and turn off, LED when switch is not pressed.

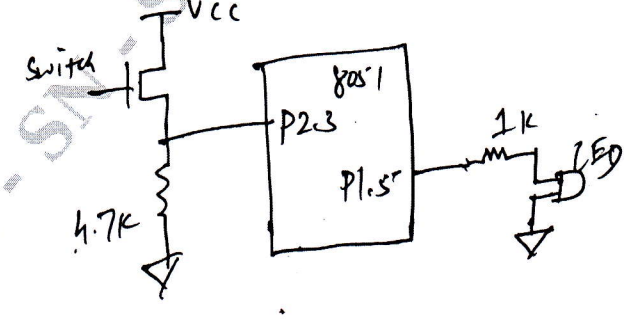

Fig Q6(c) **(04 Marks)**

7 a. Explain the brief the operation of timer in mode 1 and mode 2. Also calculate the maximum delay for both modes if XTAL is 11.0592MHz. **(10 Marks)**

b. Generate a waveform given in Fig Q7(b), if XTAL = 11.0592MHz P1.3 use timer 0 in mode 1.

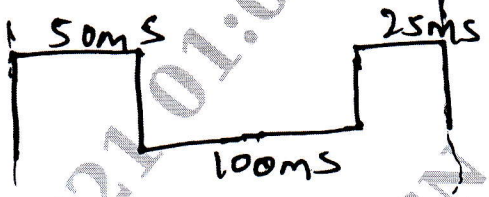

Fig Q7(b) **(10 Marks)**

8 a. Generate a square wave of frequency of 1KHz and 2KHz using timer 1 in mode 2 Assume XTAL = 22MHz. **(10 Marks)**

b. Write an 8051 C program to send two different strings to the serial port. Assuming that SW is connected to pin P2.0, monitor its status and make a decision follows :
SW = 0 : Send your data as BE
SW = 1 : Send your data as VTU
Assume XTAL = 11.0592MHz, baud rate of 9600, 8-bit data, 1 stop bit. **(10 Marks)**

9 a. Two switches are connected to pins P3.2 and P3.3. When a switch is pressed, the correspond lines goes low. Write an assemble language program to
i) Light an LED's connected to port 0 , if first switch is pressed
ii) Light all LED's connected to port 2 ; if the second switch is pressed **(10 Marks)**

b. Write a C program to create a square wave of 200ms period on pin 2.5. Use timer 0 in mode 2. Assume XTAL = 11.0592MHz. Simultaneously get data from P1.7 and send it to P1.0. **(10 Marks)**

10 a. With a neat diagram, explain interfacing of LCD to 8051. **(06 Marks)**

b. A switch is connected to pin P2.7. Write a assembly language 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)**

c. With the neat diagram, explain the interfacing of ADC 0804 to 8051 Microcontroller **(06 Marks)**

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