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Subject :- Microcontroller Embedded System.

Question 1:-

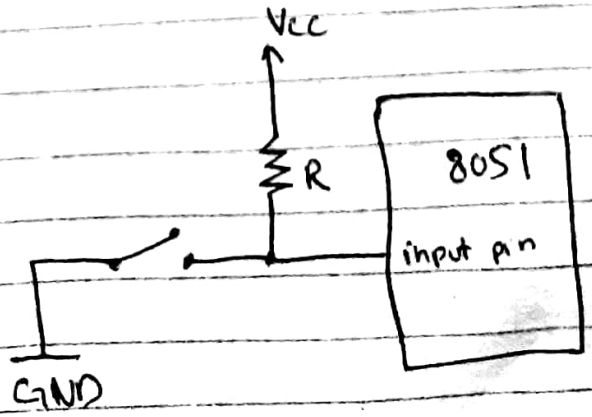
(a) Pull-up resistors:-

Pull-up resistors are fixed value resistors used between the connection of a voltage supply and a particular pin in a digital logic circuit. Which are paired with switches. Its main purpose is to ensure the voltage between Ground and Vcc is actively controlled when the switch is open. and not affecting the state of the circuit. If there are no pull-up resistors used it will end up in short-circuit.

Using Pull-up in 8051 :-

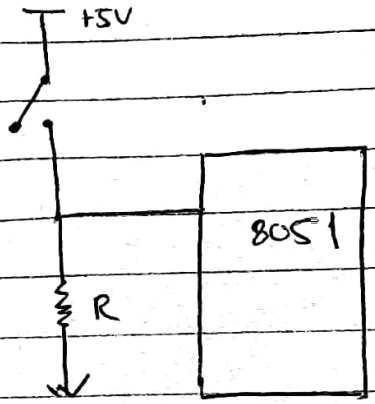
We use pull-up resistor in microcontroller when the switch is open state. and the input is in floating state. means neither low or high..

Now we will use pull-up resistor of (10K) when switch is open the input is connected to Vcc through resistor and the input reads high Now if we close it the input will be low because no current flows into input pin.



b) Pull Down Resistors:-

Pull Down resistors ensures the voltage between VCC and a microcontroller pin is actively controlled when the switch is open. Instead of pulling a pin to a high value these resistors pull the pin to a low value.



Using pull down in 8051:-

First we will connect logic gate input to the ground to Low. This pull-down resistor configuration is useful for digital circuits like latches, counters and flip flops. When we close the switch it will change its state. Also connecting inputs together will result in a larger current through the resistor.

c) In 8052 we have total three timers. which T0, T1 and T2.

d) In 89c51 we have 32 I/O pins. It means we have total 4 I/O ports. which is Port 0, Port 1, Port 2, Port 3.

e) Difference b/w Microcontroller and Microprocessor:-

*) Microprocessor consists of only a C.P.U where Microcontroller contains CPU, memory, I/O all integrated into one chip.

*) Micro processor is used in Personal computer whereas Micro controller is used in an embedded system.

*) Microprocessor uses an external bus to interface RAM, ROM and other peripherals on the other hand, Micro controller uses an internal controlling bus.

*) Microprocessor is complicated and expensive with large instructions to process while Microcontroller is inexpensive and fewer instructions to process.

Question 2 :-

a) $89501_{10} = 8?$

8	89501
8	11187 - 5
8	1398 - 3
8	179 - 6
8	21 - 6
	2 - 5

$= 256635$

b) $64101_{10} = 2?$

2	64101
2	3250 - 1
2	1625 - 0
2	812 - 1
2	406 - 0
2	203 - 0
2	101 - 1
2	50 - 1
2	25 - 0
2	12 - 1
2	6 - 0
2	3 - 0
	1 - 1

$= (1100101100101)$

c) $9AB3_{16} = ?_2$

Binary	Hexa decimal
0000	0
0001	1
0010	2
0011	3
0100	4
0101	5
0110	6
0111	7
1000	8
1001	9
1010	A
1011	B
1100	C

$9AB3_{16} = 1001101010110011$

d) $1110100100111_2 = 8?$

Using table

$\underbrace{001}_{1}\ \underbrace{110}_{6}\ \underbrace{100}_{4}\ \underbrace{100}_{4}\ \underbrace{111}_{7}$

$= (16447)_8$

e) $1011000011011_2 = 16$

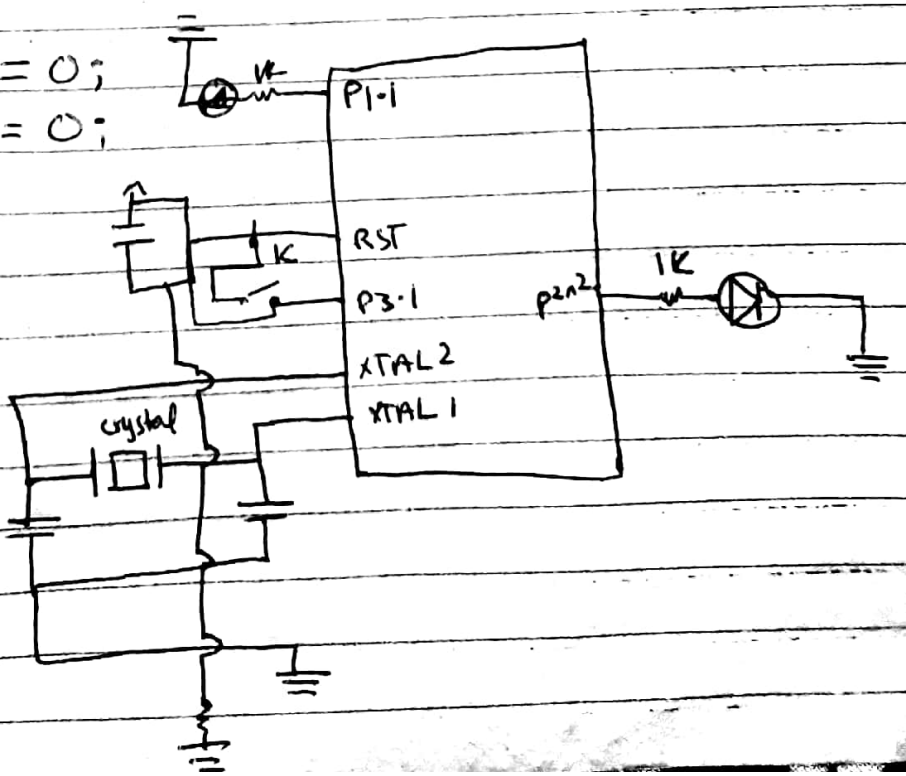
$\underbrace{0001}_{1}\ \underbrace{0110}_{6}\ \underbrace{0001}_{1}\ \underbrace{1011}_{B}$ Using above table

$= (161B)_{16}$

Question 2:-

a)

```
#include <reg51.h>
Sbit green led = P1^1
Sbit red led = P2^2
Void delay int (x);
Sbit switch = P3^1
Sbit switch = 0;
int x, y;
void main ()
{
 If (switch == 0)  ON state
 green led = 1
  red led = 0;
 }
 Else if (switch == 1) OFF state
 {
  green led = 0;
  red led = 1;
 }
 else
 {
  green led = 0;
  red led = 0;
 }
```

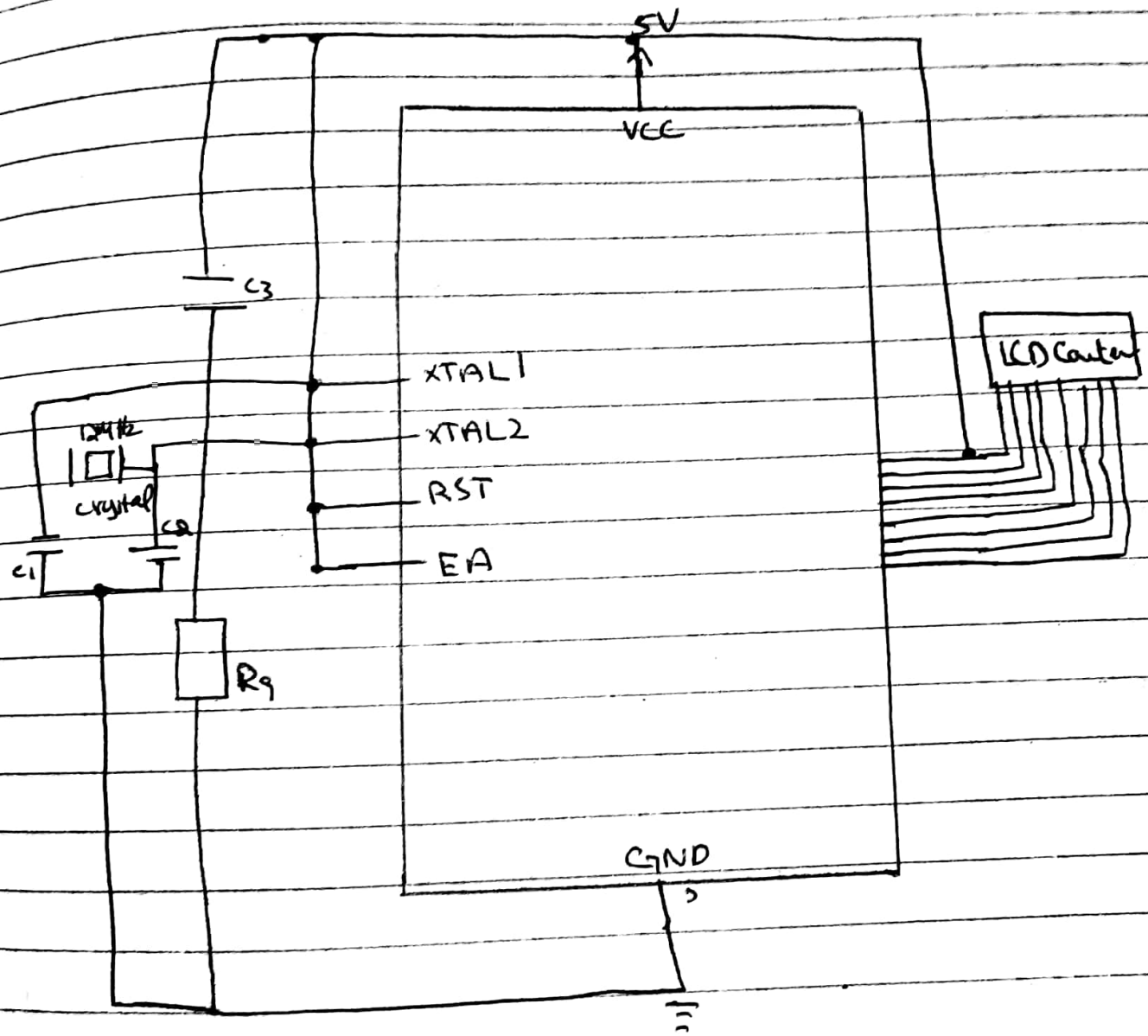


Question 2

(b)

```
#include <LiquidCrystal.h>
LiquidCrystal lcd(12,11,5,4,3,2);
int IR_1=5;
int IR_2=4;
int counter =0;
int current state =0;
int previous State_1=0;
int previous state_2=0;
int IR_1_OP;
int IR_2_op;
void setup(){
Serial.begin(9600);
PinMode(IR_1, Input);
PinMode(IR_2, Input;
lcd.begin(16,2);
}
 Void loop(){
lcd.setcursor (0,0);
lcd.set cursor (0,1);
lcd.print("CAE");
IR_1_op = digitalRead(IR_1);
IR_2_op = digitalRead(IR_2);
 Serial.println(digitalR-ead(IR_2));
If(IR_1_op == High && IR_2_OP = LOW)
{ current State =1;
}
 else
{ currentState =0;
}
 If( currentState != previous State_1)
```

```
{
  if (current State == 1)
  {
    counter = counter + 1;
    lcd.set cursor (13,0);
    lcd.print (counter);
    lcd.set cursor (4,1);
    lcd.print ("Enter");
  }
}
  previousstate_1 = currentState;
  delay (250);
  Serial.println (counte);
 if (IR1_OP == Low && IR_2_OP = HIGH)
{ currat State = 1;
}
  else
{ currentState =0;
}
 if(currentState != previousState_2)
{ if(currentState == 1)
  {
    counter = counter - 1;
   lcd.Set Cursor (13,0);
   lcd.print(Counter);
   lcd.setcursor (4,1);
   lcd.print ("Leave");
  }
}
 previousState_2= currentState;
 delay(250);
 Serial.println( counter);
```



Question 3

(a) Identify errors

```
#include <reg51.h>
Sbit led = P2^10
void delay (unsigned int x} {

    unsigned int y,z;
  for (y=0; y<=x; y++)
        for (z=0; z<=1275; z++)
}
  void main
{
    while(1) {
      led = 0
      delay (-350)      (// if we use -350 than it will be stuck in infinite loop)
      led = 1;
      delay (-350)
  }
```

All the above errors are corrected.