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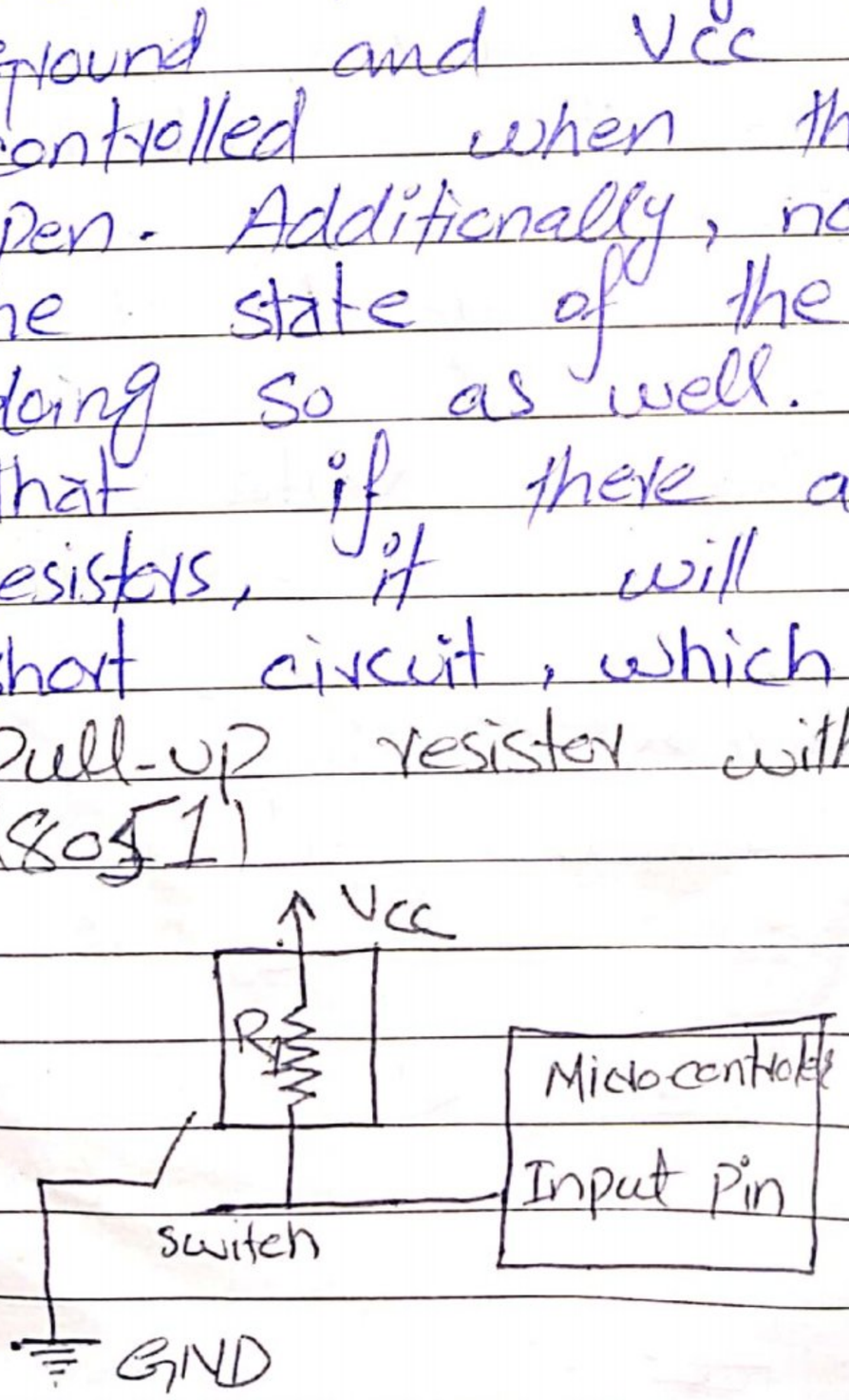
Subject Micro controller
Exam Summer (MID)

Question # 1

Part : a

(a) Pull-up resistor:-

It is a fixed value resistors used between the connection of a voltage supply and a particular pin in a digital logic circuit. More commonly paired with switches, its purpose is to ensure the voltage between ground and Vcc is actively controlled when the switch is open. Additionally, not affecting the state of the circuit when doing so as well. Do understand that if there are not pull-up resistors, it will result in a short circuit, which is not ideal. Pull-up resister with micro-controller (8051)



When switch open;

R_1 = Pull-up resistor
V_{cc} = current path → Input pin
V_{cc}(High) = voltage it input pin.

When closed switch:

current path = Vcc → Input pin → GND
voltage at input pin = GND (Low)

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using pull-up in 8051:

we use pull-up resistor in micro-controller 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 inped is connected to Vcc through resistor and the input reads high.

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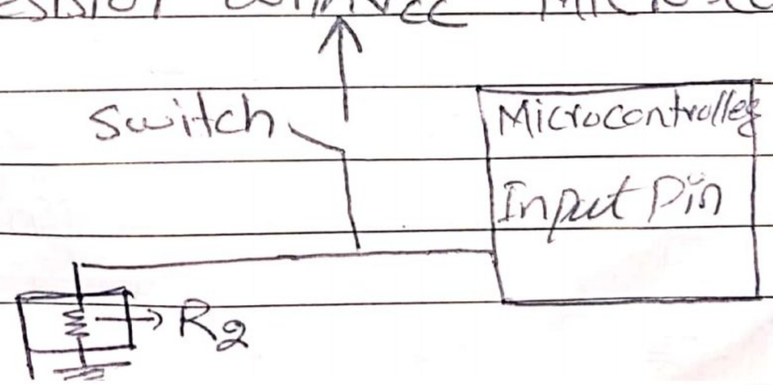
*(b) Pull-down resistor:

They pull the pin to a low value. Pull down resistor are conneted between a particular pin and the Ground terminal. Pull-down resistors should have higher resistance than the impedence of a logical circuit. It might be able to pull the voltage down and iput voltage of the Pin of micro-controler would remain at constant logical values, regardless of switch Positions.

Pull-down resistor with Vcc (8051).



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When switch open:
Rg = pull-down resister
current path = Input Pin → GND
voltage at input pin = GND (low)

When switch close:
current path = Vcc → input Pin → GND
voltage at input pin = Vcc (high)

using pull-down in 8051:

First we will convert logic gate input to the ground to low. This pull-down resistor configuration is usefull. for digital circuits like latches, counter 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) Answer:

In 8052 we have total three timers, which are T_0, T_1 and T_2

(d) Answer:-
Micro-controller 89C51 have four/4 ports. These all ports are 8-BIT bie directional ports. They can be used both is input and out-put ports. These ports are design as P0, P1, P2, P3. This micro-controller consists of 40 pins.

(e) Answer:-
Differences

Micro-controller	Micro-Processor
(1) In Micro-controller extenal Peripheral are RAM, ROM, EEPROM.	(1) In Micro-Processor extenal Peripheral is the extenal circuit.
(2) M.C are single chip	(2) M.P are bulky.
(3) M.C are cheap	(3) M.P are expensive
(4) Processing speed of micro-controller as 8 mega Hz to 50 mega Hz.	(4) Processing speed of micro-Processor is 1 giga Hz.
(5) M.C have power saving system	(5) M.P don't have power saving system.
(6) Tasks perform by M.C are simple	(6) Tasks perform by M.P are complex.

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Question # 1
Part : b

a: $89501_{10} = ?_8$

Answer: Decimal to octal

8	89501	
8	11187	5
8	1398	3
8	174	6
8	21	6
8	2	5
	0	2

$(89501)_{10} \longrightarrow \boxed{256635}$

(b) $6410l_{10} = ?_2$

Decimal to binary.

2	64101	
2	32055	1
2	16027	1
2	8013	0
2	4006	1
2	2003	0
2	1001	0
2	500	0
2	250	0
2	125	0
2	62	1
2	31	0
2	15	1
2	7	1
2	3	1
	1	1

$(6401)_{10} \rightarrow$ $(1100100001011)_2$

★ ★

(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

$9AB3_{16} = 1001101010110011_2$

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(d) 001110100100111 $_2$ = ? $_8$

(B)	0	0	→	0
0	0	1	→	1
0	1	0	→	2
0	1	1	→	3
1	0	0	→	4
1	0	1	→	5
1	1	0	→	6
1	1	1	→	7

$= 16447_8$

(e) 1011000011011 $_2$ = ? $_{16}$

0001	0110	0001	1011
1	6	1	B

By using the above hexadecimal table..

$(1\ 6\ 1\ B)_{16}$

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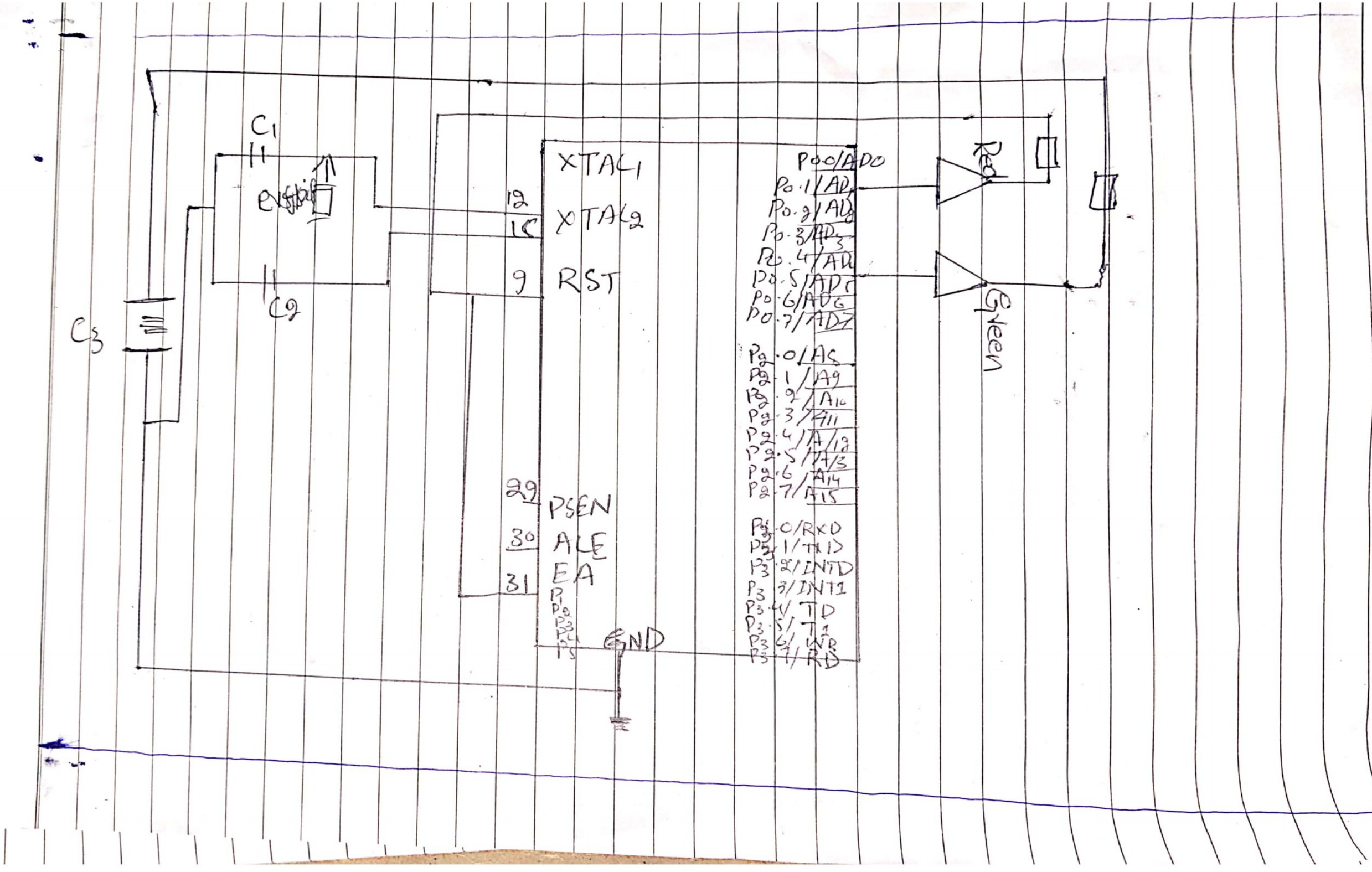
Question # 2
Part : a :

```
# include < reg 51.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 i
   void main ()

{ if (switch==0) ON state.
    green led = I
    red led = 0i }

Else if (switch = =1) OFF state

{
    green led = 0;
    red led = 1;
}
   else
{
    green led = 0;
    red led = 0;
}
```



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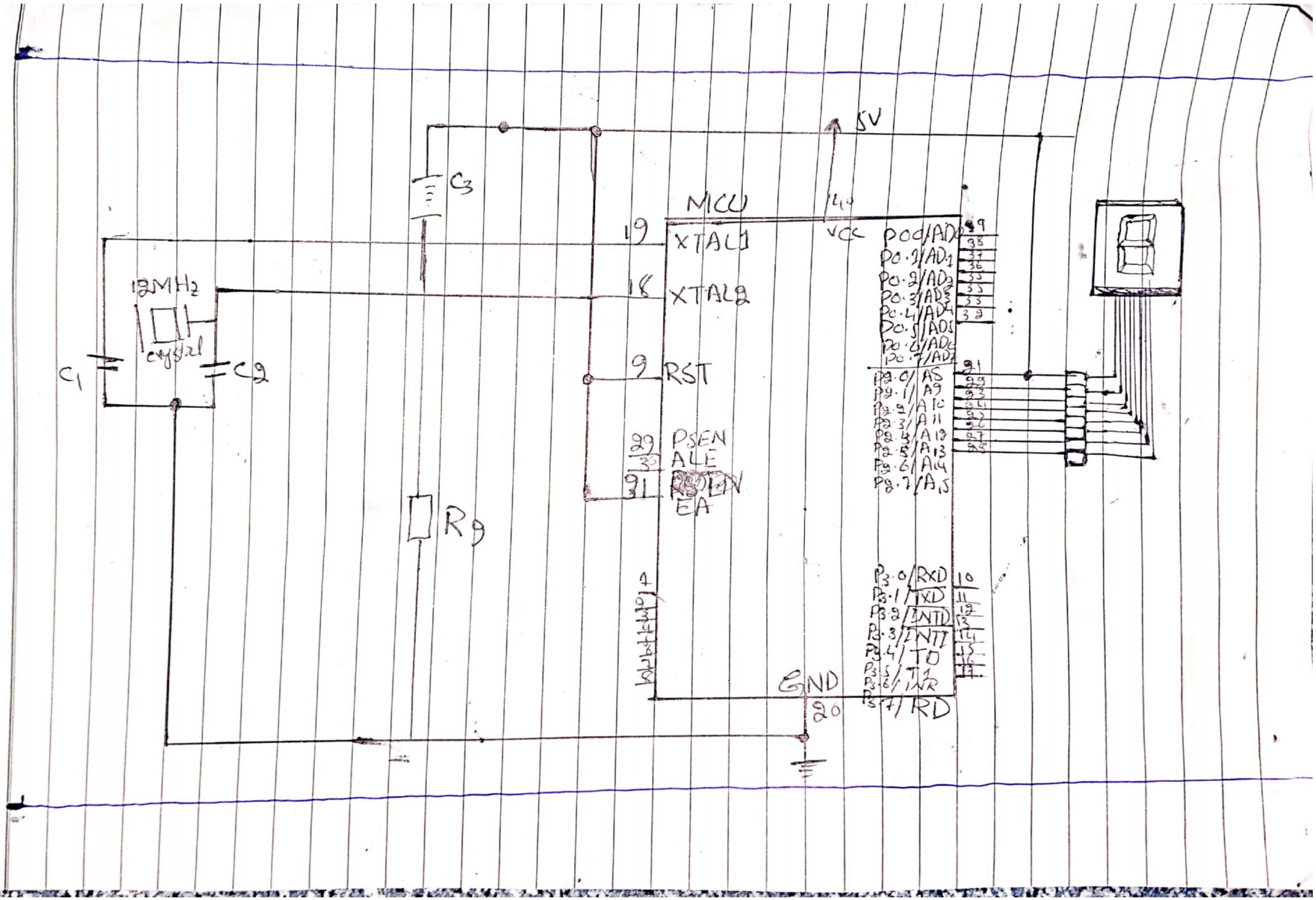
Question # 2
Part : b

```
# include < Liquid crystal . h >
Liquid crystal lcd (12, 11, 5, 4, 3, 2);
Int IR_1 = 5; // exit
Int IR_2 = 4; // enter
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 (){
  // put your setup code here,
to run once:
serial begin (9600);
  Pin Mode (IR_1, INPUT)
  Pin Mode (IR_2, INPUT);
  lcd begin (16, 2);
}

Void loop (){
  // put your main code, to run
repeatedly:
  lcd. set cursor (0, 0);
   lcd. Print ("NO. OF CARS");
  lcd . setcursor (0, 1);
  lcd Print ("CAR")
  IR_1 op = digital Read (IR_1);
  IR_2 op = digital Read (IR_2);
  serial. println (digital Read (IR_2));
if (IR_1 op == HIGH && IR_2 op == LOW
```

```
{ current state = 1;
}
  else
{ current state = 0;
}
if (current state != 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);
}.

    Previous state-1 = current state;
   delay (250);

    Serial Println (counter);
If (IR-1-OP == LOW && IR-2-op == HIGH)
{
   current state = 1;
}
else
{
    current state = 0;
}.
```

```
if   current state != Previous state_2
{
  if (current state != 1
  {
     counter = counter - 1;
     lcd.setCursor (13, 0);
     lcd.Print(counter);
     lcd.set cursor (4,1);
      lcd.Print (" LEAVE");
  }
    }

Previous state_2 = current state;
delay (250);

Serial.Println(counter);
}
```



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Question # 3

(a) Identify errors:

```
# include <reg52.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)
led = I;
delay * (-350)
```