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Subject ≠ Micro controller System & Interfacing.

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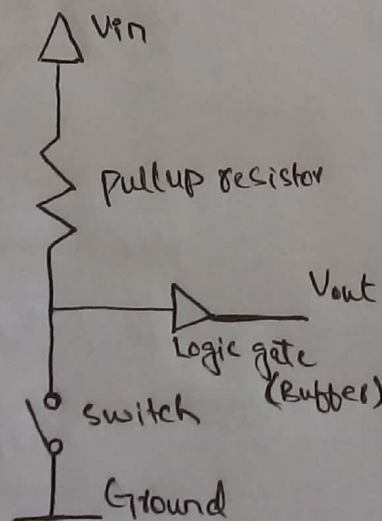
Date ≠ 26/8/2020

# Question # 1

Part (a).

Ans:- Pull up resistor are fixed value resistors used between the connection of a voltage supply & a particular pin in a digital logic circuit. More commonly paired with switches, its purpose is to ensure the voltage b/w Ground  $V_{cc}$  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 aren't pull up resistors, it'll result in a short circuit, which is not ideal.

Diagram:-

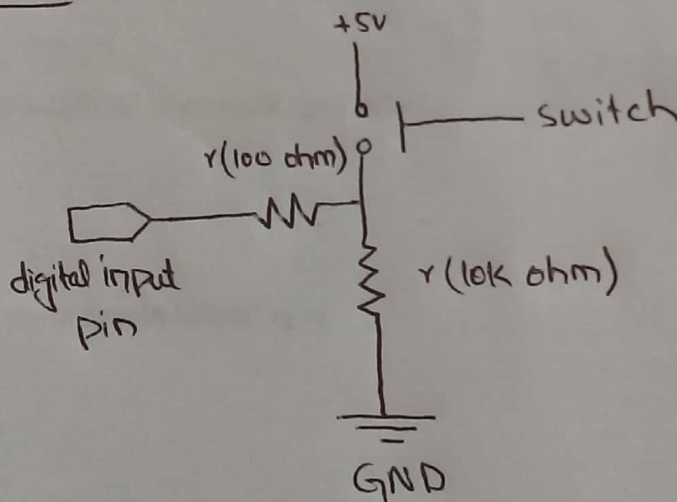


# Question #1

Part (b).

Ans:- Pull down resistors ensure the voltage b/w  $V_{CC}$  and a microcontroller pin is actively controlled when the switch is open. However, instead of pulling a pin to high value, such resistors pull the pin to a low value instead. Though being less commonly used, a pull down resistor is still a valid option.

Diagram :-





Question #1  
Part (c)

Ans:- The 8051 has two timers ~~to~~ T<sub>0</sub> & T<sub>1</sub>,  
which may be configured & used individually.  
The 8052 has an additional timer T<sub>2</sub>. All these  
counters count up on negative going edges at  
their inputs.

Question #1  
Part (d).

Ans:- In 89c51 microcontroller we have <sup>4</sup> total  
number of inputs & outputs port.

Question #1  
Part (e)

\*  
3) Difference b/w

Microcontroller:

∴

Microprocessor:

(i) Microcontroller is the heart of an embedded system

Microprocessor is the heart of computer system

(ii) Microcontroller has a processor along with internal memory & I/O components

It is only a processor, so memory & I/O components need to be connected externally

(iii) You can use it in impact system

You cannot use it in impact system.

(iv) Cost of entire system is low

Cost of entire system is high

(v) Most of microcontrollers offer power saving mode

Most of microprocessors do not have power saving features.

Question # 1  
part (b).

(a)  $89501_{10} = ?_8$

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

$89501_{10} = \boxed{256635}_8$  Ans.

(b)

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

$(1100101100101)$

Ans



(C) ~~9AB3~~

$9AB3_{16} = ?_2$

Binary	Hexadecimal.
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

$9AB3_{16} = 1001101010110011$  Ans.

7

(d)  $1110100100111_2 = ?_8$

$\underbrace{001}_1 \underbrace{110}_6 \underbrace{100}_4 \underbrace{100}_4 \underbrace{111}_7 \rightarrow (16447)_8$   
Ans.

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

$\underbrace{0001}_1 \underbrace{0110}_6 \underbrace{0001}_1 \underbrace{1011}_B \rightarrow$  from table.  
(161B) Ans.



## Question # 2

### Part (a).

Ans:-

```
#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;
```

```
}
```

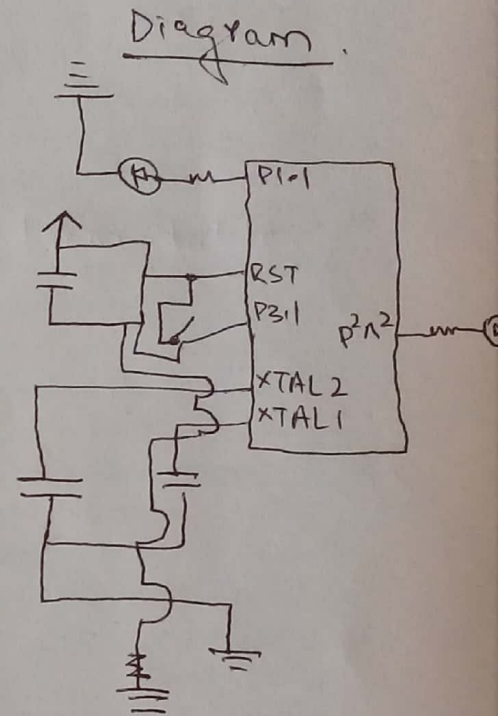
```
else
```

```
{
```

```
green led = 0;
```

```
red led = 0;
```

```
}
```



Question # 2.  
Part (b).

Ans:-

```
#include <liquidCrystal.h>
LiquidCrystal 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);
  pinMode (IR_1, INPUT);
  pinMode (IR_2, INPUT);
  lcd.begin (16, 2);
}
void loop() {
  // put your main code here, to run
  repeatedly
```

```
lcd.setCursor(0,0);
lcd.print("No. OF CARS:");
lcd.setCursor(0,1);
lcd.print("CAR");

IR_1_OP = digitalRead(IR-1);
IR_2_OP = digitalRead(IR-2);
serial.print(digitalRead(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.setCursor(13,0);
        lcd.print(counter);
        lcd.setCursor(4,1);
        lcd.print("Enter");
    }
}
```



}

```
previousstate_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)
```

```
{
```

```
  counter = counter - 1;
```

```
  lcd.setCursor(13, 0);
```

```
  lcd.print(counter)
```

```
  lcd.setCursor(4, 1);
```

```
  lcd.print("LEAVE");
```

}

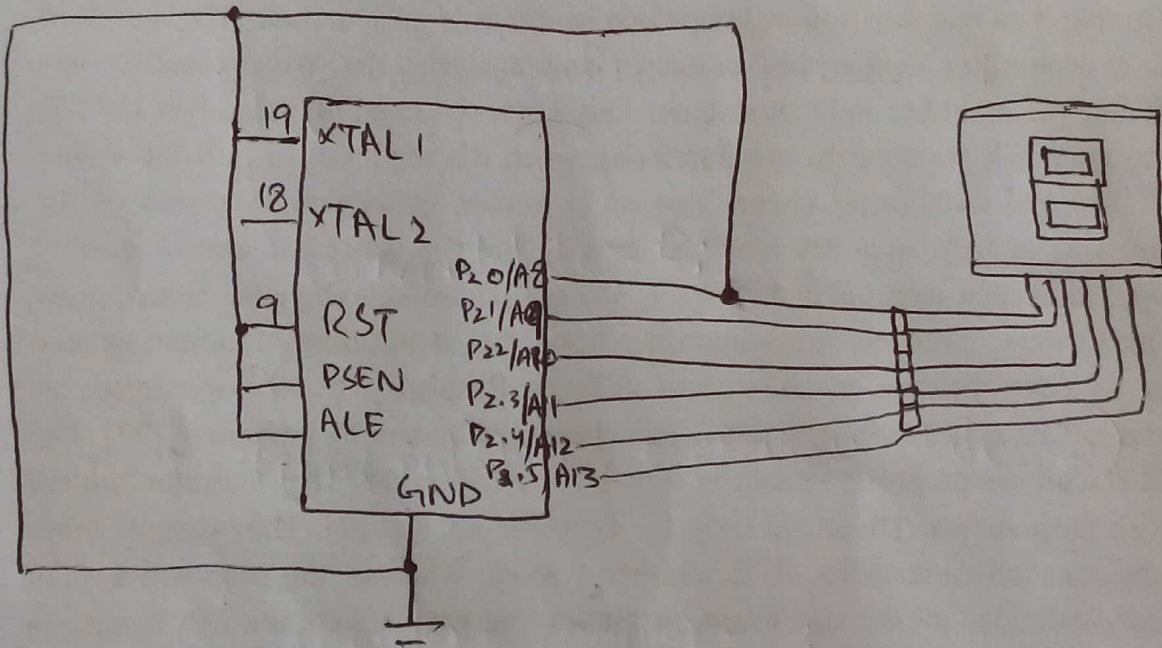
}

```
previousstate_2 = current state;
```

```
delay(250);
```

```
serial.println(counter
```

Diagram:-



### Question # 3.

Answer:-

\* ) 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
        delay (-350)
        led = 1;
        delay (-350)
    }
}
```