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Subject Microcontroller

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Q 1:

Part (a)

Explain the difference between microprocessor and micro controller.

Ans:

Micro processor consist of only a central processing unit, whereas micro controller contains a CPU memory I/O all integrated into one chip.

Microprocessor uses an external bus to interface to RAM, ROM and

micro controller uses an internal controlling bus.

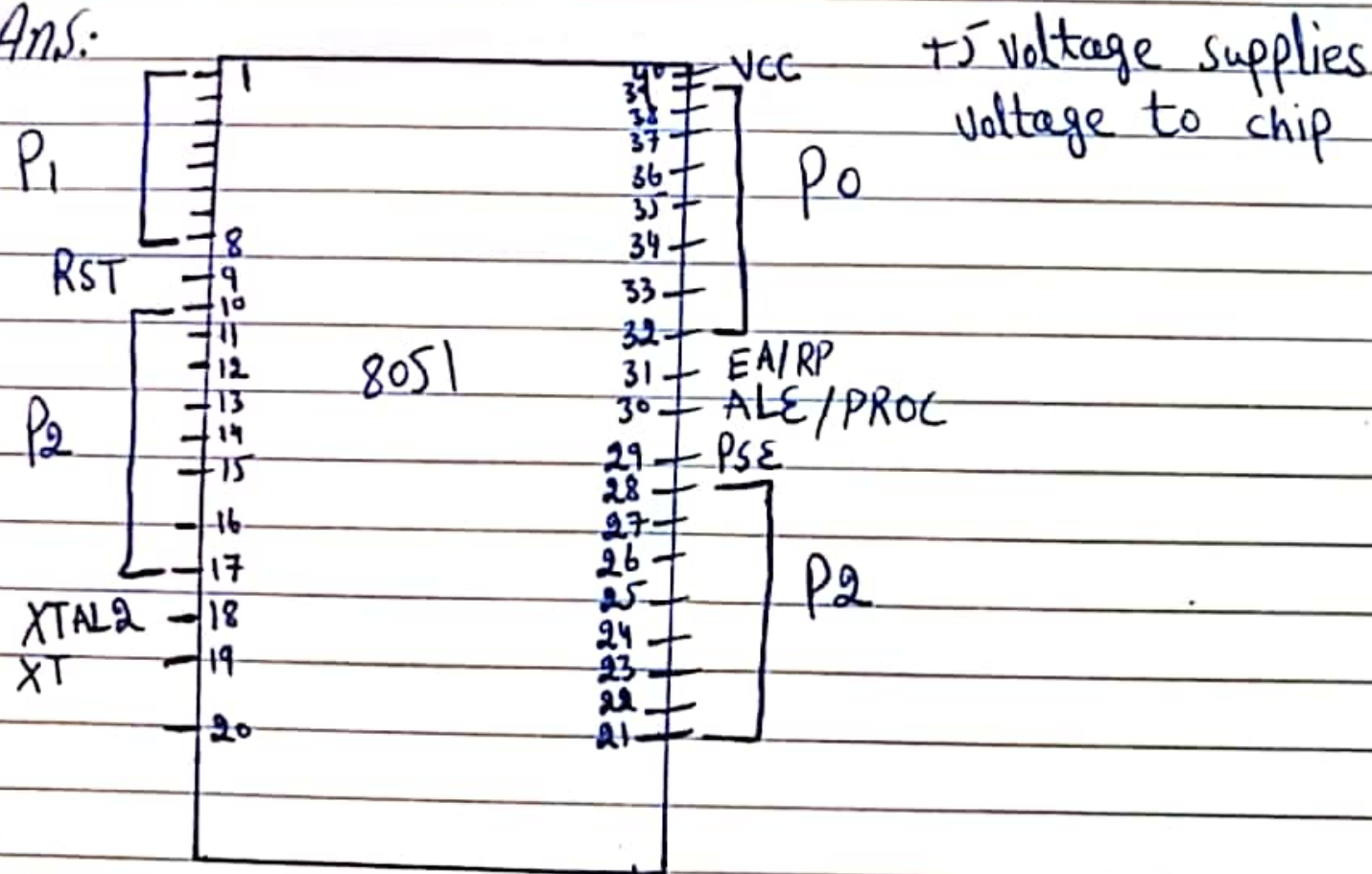


Q 1

part (b)

Draw the pin diagram of the Intel 8051 microcontroller.

Ans:



A Total 32 pin are set a side for the Four ports P<sub>0</sub>, P<sub>1</sub>, P<sub>2</sub> and P<sub>3</sub> when each ports Takes 8 pines.

Date: page 3



Q1  
part (a)

How many hardware timers are  
present in 8052?

Ans:

The 8052 has an additional  
Timer T<sub>2</sub>.

All these counters count up on neg  
going edges at their input.



Q 1  
part (D)

Explain the dual role of port 0,  
port 2, port 3.

Ans:

The 8051 microcontroller then multiplexes the input as address or data in order to save pins. Dual role of port 2 - Besides washing as I/O, port P<sub>2</sub> is also used to provide 16-bit address bus for external memory along with port 0.

Date: page 5



Q 1

part (a)

Make accurate delay of 56.384 ms

using timer 1 in mode 1.

Ans: Delay of 56.384

```
# Include <reg51.h>
```

```
void T1_Delay();
```

```
void main (void)
```

```
{
```

```
while 1
```

```
{
```

```
P1 = 0x55;
```

```
T1_Delay();
```

```
P1 = 0xAA
```

```
T1_Delay();
```

```
}
```

```
}
```

```
void T1_Delay ()
```

```
TMOD = 0x01;
```

```
T1 = 0x00;
```

```
TR1 = 1;
```

```
while (TF0 == 0);
```

```
TR1 = 0;
```

```
TF1 = 0;
```

```
}
```

Q 1

Part (f)

Make accurate delay of 50ms using timer 1 in mode 1.

```
ANS: #include <reg 51.h>
```

```
sbit Led = P0^0;
```

```
void timer Delay ()
```

```
{
```

```
TH0 = 0x4B;
```

```
TLO = 0xFD;
```

```
TR0 = 1;
```

```
while (TF0 == 0);
```

```
TF0 = 0;
```

```
TR0 = 0;
```

```
}
```

```
void main
```

```
{
```

```
TMOD = 0x01;
```

```
while (1)
```

```
{
```

```
LED = 1;
```

```
timer Delay ();
```

```
LED = 0;
```

```
timer Delay ();
```

```
}
```



Q 2:

You are asked to make a standalone communication like using two 8051 microcontrollers. one 8051 microcontroller will be with user 1 while the other with user 2. user 1 will enter number which will be transmitted to user 2 and will be displayed on user 2's LCD screen and vice-versa on user 1. Data should be sent and received through serial communication ONLY. Write the code in C-language and draw the circuit diagram.

```
#include <reg51.h>
```

```
sbit button 1 = P1 ^ 0;
```

```
sbit button 2 = P1 ^ 1;
```

```
sbit out 1 = P3 ^ 0;
```



Date: page 8



Shift out 2 = P3 " 1 . ,

void main ( )

{

if (button 1 == 0)

{

out 1 = 1 . ,

}

if (button 2 == 0)

out 2 = 1 . ,

}

else

{

out 1 = 0 . ,

out 2 = 0 . ,

}

This code will be used for

user 1



use 2 code :

```
#include <reg 51.h>
```

```
#define out P2
```

```
Sbit in1 = P1^0;
```

```
Sbit in2 = P1^1;
```

```
unsigned int num = 0x00;
```

```
int convert (void);
```

```
void delay (void);
```

```
void main ()
```

```
{
```

```
out = 0x00;
```

```
while (1)
```

```
{
```

```
if (in1 == 0)
```

```
{
```

```
delay ();
```



num ++

out = convert ( ) ;

}

if ( num2 == 1 )

{

delay ( ) ;

num -- ;

out = convert ( ) ;

}

}

int convert ( )

{

unsigned int num1 = num / 10 ;

unsigned int num2 = num / 10 ;

return ( num2 + 4 ) | num ;

}

Date: page 11

```
void delay ()
```

```
{
```

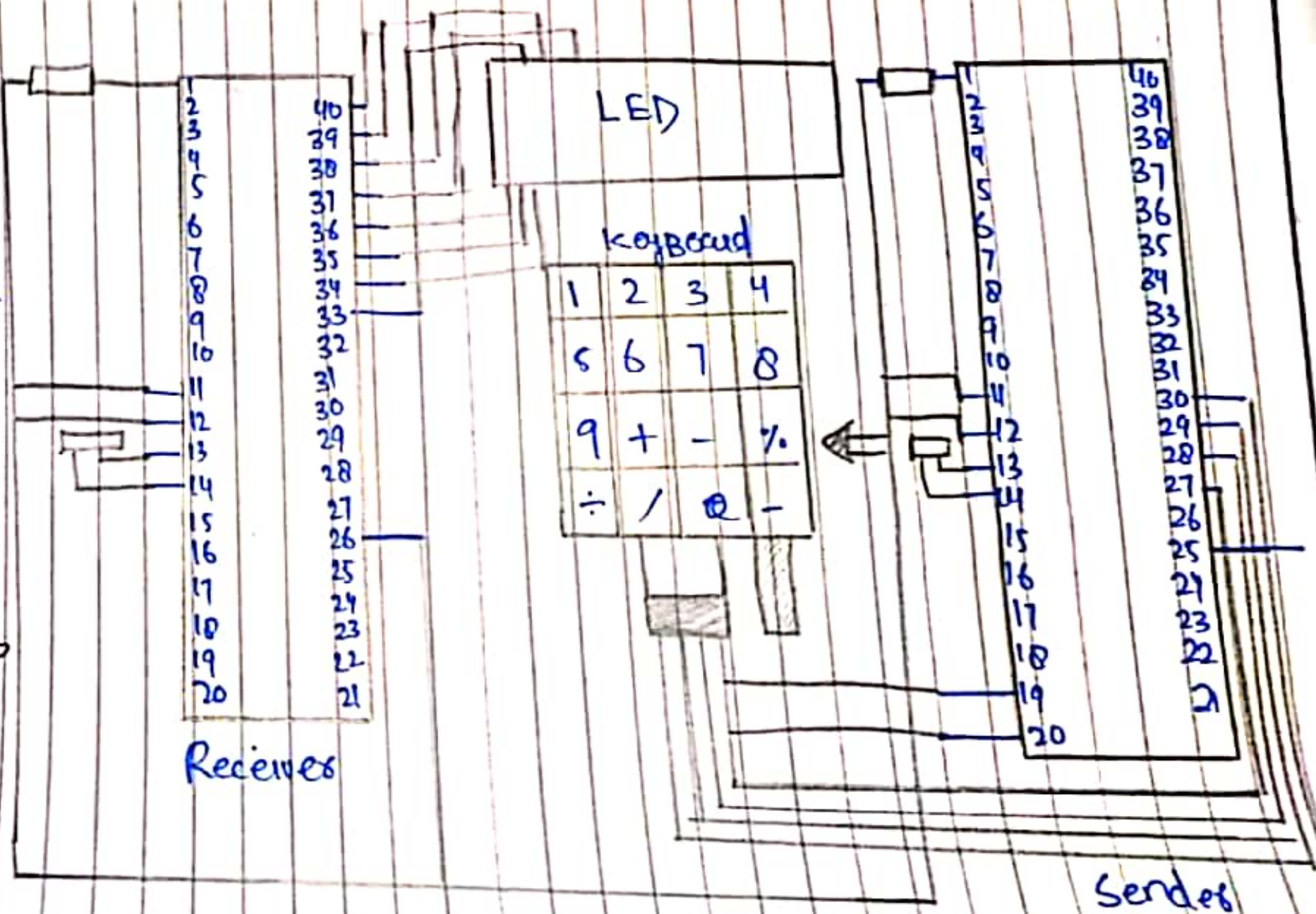
```
    unsigned int i, j;
```

```
    for (i=0; i<100; i++)
```

```
        for (j=0; j<500; j++);
```

```
}
```

Circuit Diagram:



Date: Page 12

Q3:

You are asked to make a small remote controlled car using two 8051 microcontrollers. one will be your transmitter and the other receiver. Transmitter will send command for forward and reverse using two pushbuttons on the transmitted side using serial communication. Receiver will examine the data received and act accordingly using two brushless DC-Motors operating at 24V. Write the code in C-language and draw the circuit diagram.



Solution:

```
#include <reg 51.h>
```

```
sbit m1p = P2^0
```

```
sbit m1n = P2^1
```

```
sbit m2p = P2^2
```

```
sbit m2n = P2^3
```

```
sbit F = P1^0
```

```
sbit Ba = P1^1
```

```
void forward ()
```

```
{
```

```
    m1p = 1;
```

```
    m2p = 1;
```

```
    m1n = 0;
```

```
    m2n = 0;
```

```
}
```

Date: Page 14



void backward ()

$m1p = 0.9$

$m2p = 0.9$

$m1n = 1.9$

$m2n = 1.9$

}  
void stop ()

{  
 $m1p = 0.9$

$m1n = 0.9$

$m2p = 0.9$

$m2n = 0.9$

code for Receiver which will  
receives command from transmitter.





```
# include <reg51.h>
```

```
{
```

```
void main ()
```

```
{
```

```
F = 0.9
```

```
Ba = 0.9
```

```
while (1)
```

```
{
```

```
if F == ()
```

```
Forward ()
```

```
else if Ba == ()
```

```
backward ()
```

```
stop ()
```

```
}
```

```
}
```



Q4 part (A):

Solution:

The above code is using for blinking the LED with 100ms delay

We have given a condition if switch is on and LED 1 is on. So as a result

LED 2 is off and we have a delay of 100ms. After 100ms delay the LED 2 is again on.

Now if LED 1 is off and switch 1 is on also LED 2 ~~is on~~ with

100ms delay after this delay  
LED2 again off.

Basically this code is using  
for blinking between LED 1  
and LED 2 with 100ms delay.

Date: page 18



Q4

Part B: solution:

```
#include <reg50.h>
```

```
sbit SW1 = P3^1;
```

```
unsigned int i = 0;
```

```
void delay_ms (unsigned int x)
```

```
{
```

```
    unsigned int y, z;
```

```
    for (y = 0; y <= x; y++)
```

```
        for (z = 0; z <= 1275; z++)
```

```
}
```

```
void main (1)
```

```
{
```

```
    while (0)
```

```
{
```

```
    if (SW1 == 1)
```



```
P3 = i++ ;
```

```
delay_ms(1000);
```

```
}
```

```
}
```



Paper the END