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Reg No : 19BCE10071
Subject : Embedded System
Date : May 16, 2022.

Term End Examination.

1] (b)

Registration number = 071

Delay = 071

Code

```
#include <reg51.h>
sbit mybit = P2^4;
void MSDelay (unsigned int itime)
  {
    unsigned int i,j;
    for(int i=0; i< itime; i++)
      {
        for (int j=0; j<1000; j++);
      }
  }

void main ()
  {
    while (1)
      {
        mybit = ~mybit;
        MSDelay (071);
      }
  }
```

2](a) Generating UART communication packet.

Given hexadecimal data = 45h

Hence Equivalent binary = 01000101

Start bit (1 bit)	Data frame (5-9 data bit)	Parity bit (0 to 1)	Stop bit (1 to 2)

Start bit

To start the transfer of data, the transmission UART pulls the transmission line from high to Low from one (1) to clock cycle.

Data frame

One data frame is 0 1 0 0 0 1 0 1

↑ MS bit ↑ LS bit

Data frame is sent with the Least Significant bit (LSB).

Parity.

Parity describes the evenness or oddness of a number.

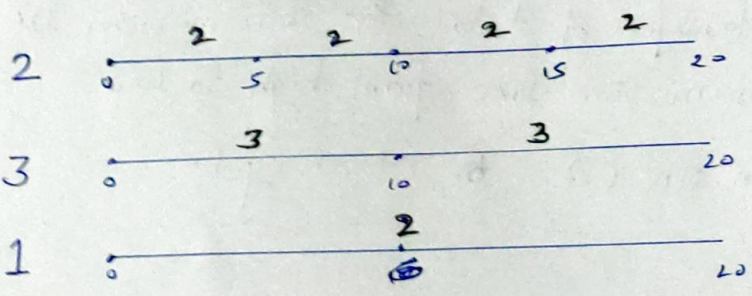
- If the parity bit is a 0/even parity, then 1 or Logic High bit in the data frame should total to an even number.
- If the parity bit is 1 (odd), the 1 bit or Logic high in the data frame should total to an odd number.

Priority.

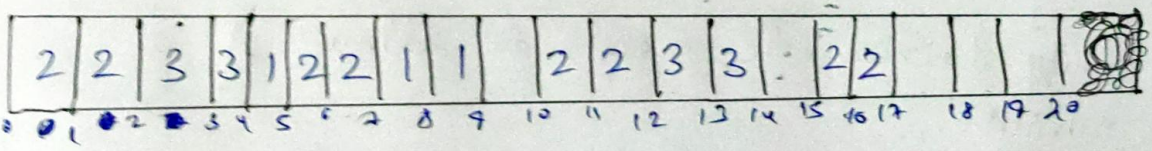
It is highest for the process which has least running time period. Thus 2 has highest priority then 3 and lastly 1.

$\therefore 2 > 3 > 1$

Representation and Flow



Thus, process 2 executes 4 times for every 5 time units, process 3 executes 3 times for every 10 time units, and process 1 executes 2 times for every 20 time units.



3](b)

Rate Monotonic Scheduling

Release time for all tasks = 0s

Process	Execution Time	Time Period
1	2	20
2	3	5
3	2	10

Firstly,

$$n(2^{1/n} - 1) = 3(2^{1/3} - 1) = 0.7977$$

$$u = 2/20 + 3/5 + 2/10 = 0.9$$

$\because u < 1$

$\therefore$ the combined utilization of 3 process is less than the threshold of these processes that means the above set of processes once scheduled and thus satisfy the Equation of the algorithm.

Scheduling time.

We calculate the LCM of time period of all processes.

LCM (20, 5, 10), i.e, 20

Thus we can schedule 20 time units.

- When the parity bit matches the data, the UART knows that the transmission was free of errors.

Therefore,

Total no. of 1's = 3

and 3 is an ODD number

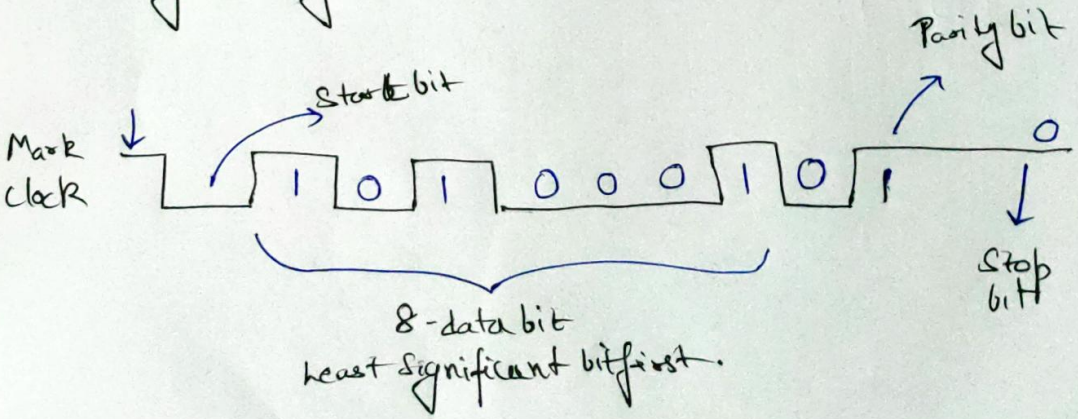
∴ parity bit = 1

Stop bit

To signal the end of the data packet, the sending UART drives the data transmission line from the Low voltage to a high voltage for (1) to (2) bit of duration.

It is the last bit of the packet and it indicates the end of the packet.

Timing Diagram



5]


```
#include <reg51.h>

sbit READ_ADC = P0^0;
sbit WRITE_ADC = P0^1;
sbit INTR_ADC = P0^2;
char temp[] = "0000C";
unsigned char ADC_value;
int c;

void delay_ms (unsigned int time)
  {
    int i,j;
    for (i = 0; i< time; i++)
    for (j=0; j< time; j++)
  }

Void main ()
  {
    P0 = 0x00;
    P1 = 0x00;
    P2 = 0x00;
    P3 = 0x04;
    IE = 0x81;
    IT0 = 1;

  }.
```

Void ~~ISR~~

```
Void IGR_Ex(void)
{
    P1 = 0xFF;
    INTR_ADC = 1;
    READ_ADC = 1;
    WRITE_ADC = 1;
    while(1)
    {
        WRITE_ADC = 0
        delay_ms(1);
        WRITE_ADC = 1;
        while(INTR_ADC == 1);
        READ_ADC = 0;
        ADC_value = P3;
        C = ADC_value * 1.95;
        if(c > 99)
            temp[0] = 1 + 48;
        else {
            temp[0] = '';
            temp[1] = (C/10)%10 + 48;
            temp[2] = C%10 + 48;
            temp[5] = 223;
        }
        delay_ms(10)
        READ_ADC = 3;
        delay_ms = 1000;
    }
}
```

Here, I am using external entering in which I am taking input of temperature from sensor and converting it to °C using ADC.

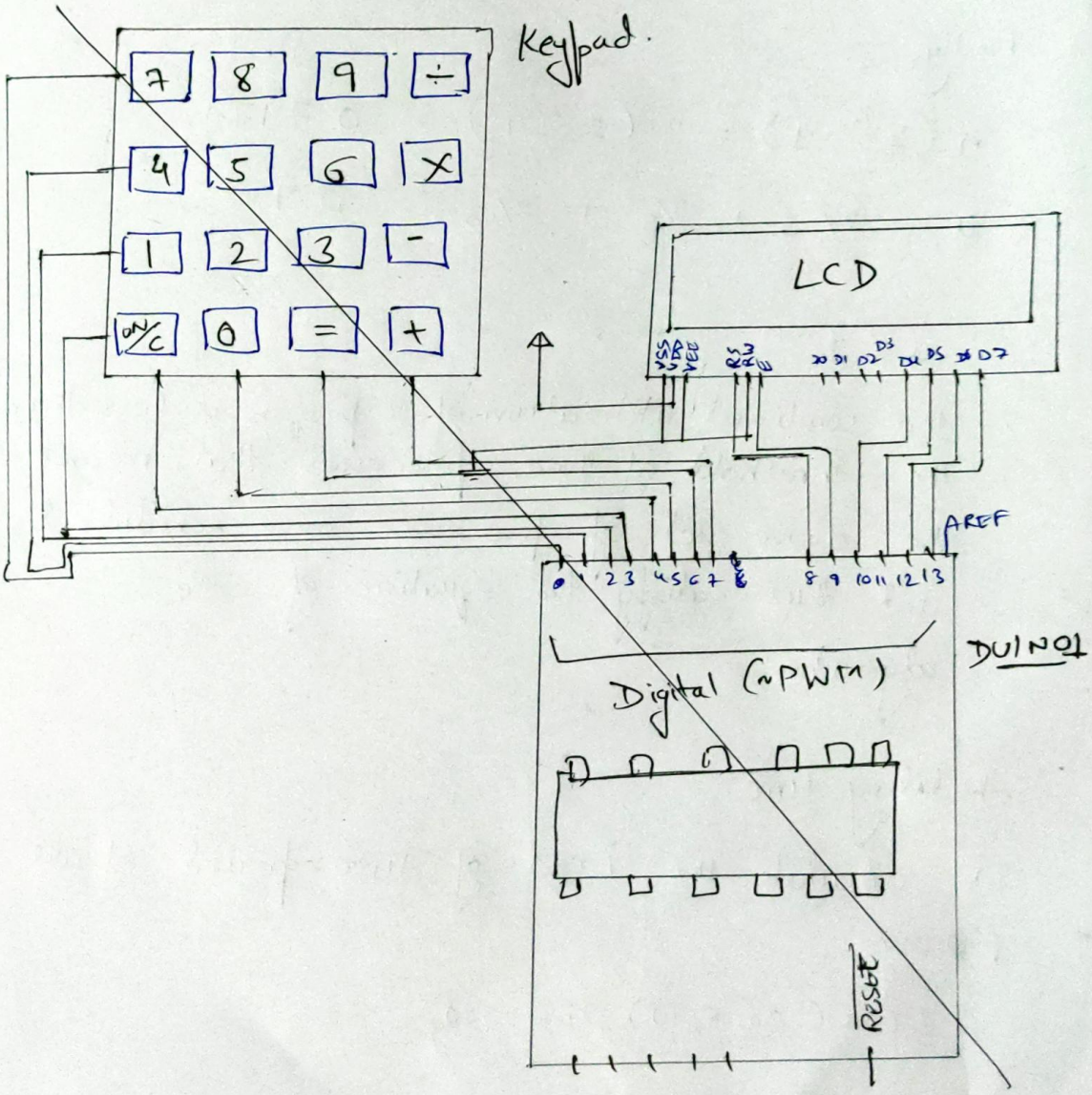
PTO

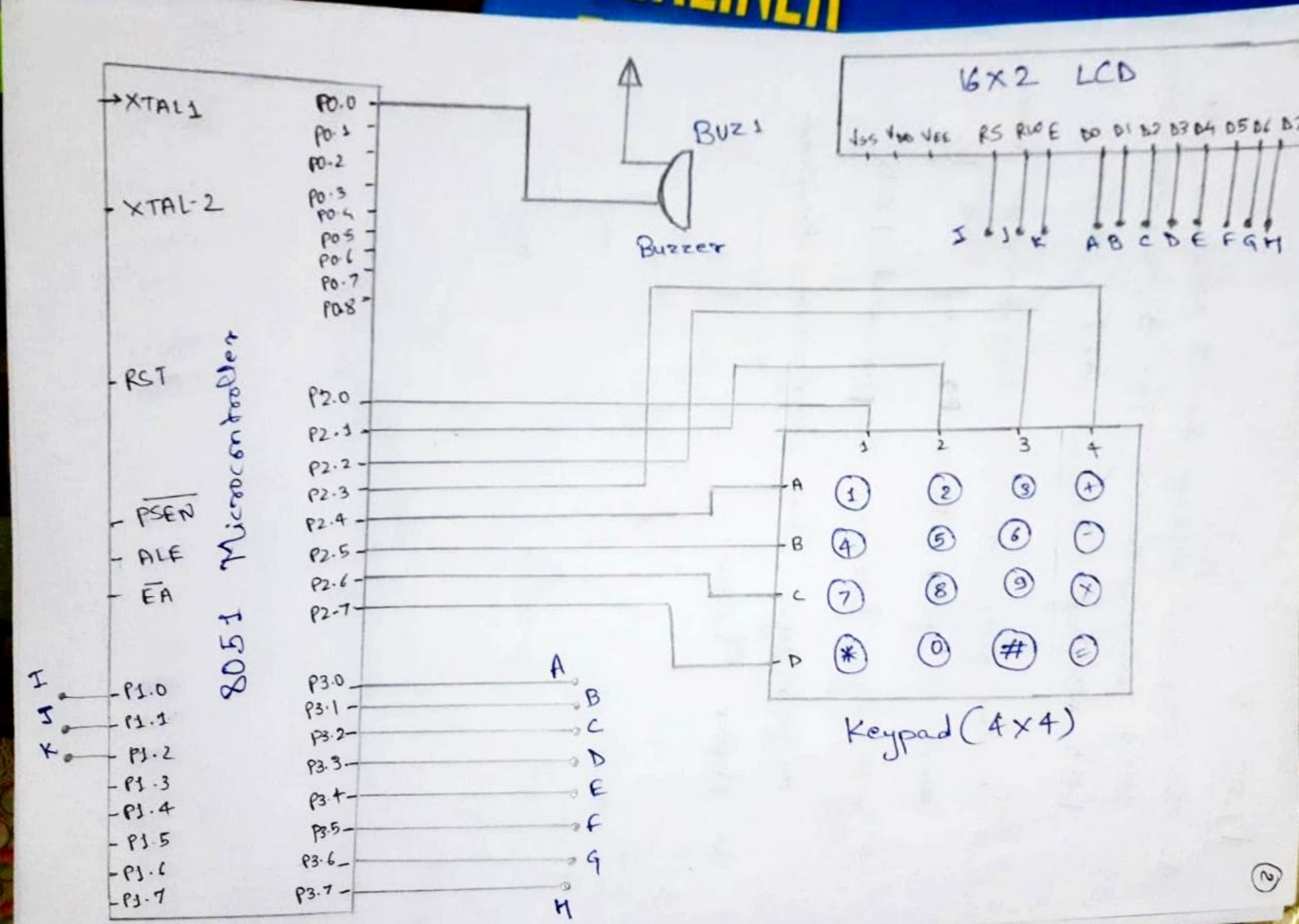
4] SMART VENTING MACHINE

Materials

- Arduino
- 16×2 LCD Display
- 4×4 Keypad.
- Breadboard and connecting wires.

Connection Diagram




XTAL1
XTAL-2
RST
PSEN
ALE
EA
8051 Microcontroller
P0.0
P0.1
P0.2
P0.3
P0.4
P0.5
P0.6
P0.7
P0.8
P2.0
P2.1
P2.2
P2.3
P2.4
P2.5
P2.6
P2.7
P3.0
P3.1
P3.2
P3.3
P3.4
P3.5
P3.6
P3.7
P1.0
P1.1
P1.2
P1.3
P1.4
P1.5
P1.6
P1.7
I
J
K
A
B
C
D
E
F
G
H
BUZ 1
Buzzer
16X2 LCD
VSS
VDD
VEE
RS
RW
E
D0
D1
D2
D3
D4
D5
D6
D7
I
J
K
A
B
C
D
E
F
G
H
1
2
3
4
A
B
C
D
1
2
3
+
4
5
6
-
7
8
9
X
*
0
#
=
Keypad (4X4)
2