

1. In a conference hall there are two sensors connected to entry door and exit door? Write a program using interrupts to show how many people are there in the conference hall at a given time.

```
ORG 0H
LJMP L1
```

```
ORG 0003H      //ENTRY ROOM
INC A
RETI
```

```
ORG 0013H      //EXIT SENSOR
DEC A
RETI
```

```
L1: MOV IE,#10000101B
    SETB TCON.0
    SETB TCON.2
    MOV P0,A
    SJMP L1
END
```

2. Write a program to switch on an alarm for 0.3ms and off for 0.7ms using timers.

```
    MOV TMOD,#01H
ON: MOV A,#0FFH
    MOV P0,A
    MOV TH0,#0FEH
    MOV TL0,#0ECH
L1: SETB TR0
L2: JNB TF0,L2
    CLR TR0
    CLR TF0
    CJNE A,#0FFH,ON
```

```
OF: MOV A,#0H
      MOV P0,A
      MOV TH0,#0FDH
      MOV TL0,#07BH
      SJMP L1
```

END

3. Write a program to transmit a message “this is a demo” at 3200 bauds to another microcontroller?

```
MOV TMOD,#20H
MOV TH1,#-9
MOV SCON,#50H
SETB TR1
MOV A,#"t"
ACALL TR
MOV A,#"h"
ACALL TR
MOV A,#"i"
ACALL TR
MOV A,#"s"
ACALL TR
MOV A,#" "
ACALL TR
MOV A,#"i"
ACALL TR
MOV A,#"s"
ACALL TR
MOV A,#" "
ACALL TR
MOV A,#"d"
ACALL TR
MOV A,#"e"
```

```

        ACALL TR
        MOV A, #"m"
        ACALL TR
        MOV A, #"o"
        ACALL TR
        SJMP L2
TR:     MOV SBUF, A
L1:     JNB TI, L1
        CLR TI
        RET
L2:     NOP
END

```

4. Write a program to receive a data whose length is 9 bits at 1600 bauds?

```

        MOV TMOD, #20H
        MOV TH1, #-18
        MOV SCON, #0D0H //MODE 3
        SETB TR1
L1:     JNB RI, L1
        MOV A, SBUF      //RECEIVED BYTE
        MOV C, RB8       //9TH BIT
        CLR RI
END

```

6. Write a program to display the data “LCD DEMO”, with right to left display with cursor blinking using LCD?

```

        ORG 0H
        MOV A, #38H //INIT
        ACALL CW
        MOV A, #0EH //DISPLAY ON, CURSOR BLINKING
        ACALL CW
        MOV A, #01H //CLEAR LCD

```

```

ACALL CW
MOV A,#1CH //SHIFTING ENTIRE DISPLAY TO RIGHT
ACALL CW
MOV A,#04H //DECREMENT CURSOR(TOWARDS LEFT)
ACALL CW
MOV A,#'L'
ACALL DR
MOV A,#'C'
ACALL DR
MOV A,#'D'
ACALL DR
MOV A,#' '
ACALL DR
MOV A,#'D'
ACALL DR
MOV A,#'E'
ACALL DR
MOV A,#'M'
ACALL DR
MOV A,#'O'
ACALL DR

```

```
HE: SJMP HE
```

```
CW: MOV P1,A
```

```

CLR P2.0 //RS
CLR P2.1 //R/W
SETB P2.2 //E
CLR P2.2
ACALL DE
RET

```

```
DR: MOV P1,A
```

```

SETB P2.0 //RS
CLR P2.1 //R/W

```

```

        SETB P2.2  //E
        CLR P2.2
        ACALL DE
        RET
DE: MOV R0,#100
L1: MOV R1,#255
L2: DJNZ R1,L2
        DJNZ R0,L1
        RET
END

```

7. Write a program to display the data “LCD DEMO1”, with left to right display with display on, cursor off using LCD?

```

ORG 0H
MOV A,#38H //INIT
ACALL CW
MOV A,#0CH //DISPLAY ON, CURSOR OFF
ACALL CW
MOV A,#01H //CLEAR LCD
ACALL CW
MOV A,#06H //INCREMENT CURSOR(TOWARDS RIGHT)
ACALL CW
MOV A,#'L'
ACALL DR
MOV A,#'C'
ACALL DR
MOV A,#'D'
ACALL DR
MOV A,#' '
ACALL DR
MOV A,#'D'
ACALL DR

```

```

        MOV A,#'E'
        ACALL DR
        MOV A,#'M'
        ACALL DR
        MOV A,#'O'
        ACALL DR
        MOV A,#'1'
        ACALL DR
HE: SJMP HE
CW: MOV P1,A
      CLR P2.0    //RS
      CLR P2.1    //R/W
      SETB P2.2   //E
      CLR P2.2
      ACALL DE
      RET
DR: MOV P1,A
     SETB P2.0    //RS
     CLR P2.1     //R/W
     SETB P2.2    //E
     CLR P2.2
     ACALL DE
     RET
DE: MOV R0,#100
L1: MOV R1,#255
L2: DJNZ R1,L2
     DJNZ R0,L1
     RET
END

```

8. Write a program to acquire the data from LM 35 temperature sensor and display the temperature in Fahrenheit?

```

//ASSUME THAT VREF/2 IS CONNECTED TO 1.28V TO PROVIDE 10mV STEP SIZE
//ASSUME THAT Vin+ IS CONNECTED TO LM35 OUTPUT
#include<reg51.h>
unsigned int d,d1,d2,d3,t,j;
float a;
int ar[50]={0x3f,0x06,0x5b,0x4f,0x66,0x6d,0x7d,0x07,0x7f,0x6f};
//for cathode 7 seg
void delay(int n);
int adc();
sbit rd=P3^5;
sbit wr=P3^6;
sbit intr=P3^7;
sbit led1=P2^0;          //ones
sbit led2=P2^1;          //tens
sbit led3=P2^2;          //hundreds
void main()
{
    while(1){
        a=adc();
        d=(a*1.8)+32;    //celsius to fahrenheit conversion
        d1=d/100;
        t=d%100;
        d2=t/10;
        d3=t%10;
        for(j=0;j<=10;j++)
        {
            led1=1;
            P0=ar[d1];
            delay(100);
            led2=1;
            P0=ar[d2];
            delay(100);

```

```

        led3=1;
        P0=ar[d3];
        delay(100);
    }
    P2=0x00;
}
}
int adc()
{
    P1=0xff; //P1 is connected to ADC
    rd=1;
    wr=0; //L-H PULSE
    wr=1;
    while(intr==1);
    rd=0; //H-L PULSE
    return P1;
}
void delay(int n)
{
    for(j=0;j<=n;j++);
}

```

9. Write a program to acquire the data from LM 35 temperature sensor and display the temperature in celsius?

```

//ASSUME THAT VREF/2 IS CONNECTED TO 1.28V TO PROVIDE 10mV STEP SIZE
//ASSUME THAT Vin+ IS CONNECTED TO LM35 OUTPUT
#include<reg51.h>
unsigned int d,d1,d2,d3,t,j;
float a;
int ar[50]={0x3f,0x06,0x5b,0x4f,0x66,0x6d,0x7d,0x07,0x7f,0x6f};
//for cathode 7 seg
void delay(int n);
int adc();

```



```

sbit rd=P3^5;
sbit wr=P3^6;
sbit intr=P3^7;
sbit led1=P2^0;      //ones
sbit led2=P2^1;      //tens
sbit led3=P2^2;      //hundreds
void main()
{
    while(1){
        a=adc();
        d=a;
        d1=d/100;
        t=d%100;
        d2=t/10;
        d3=t%10;
        for(j=0;j<=10;j++)
        {
            led1=1;
            P0=ar[d1];
            delay(100);
            led2=1;
            P0=ar[d2];
            delay(100);
            led3=1;
            P0=ar[d3];
            delay(100);
        }
        P2=0x00;
    }
}

int adc()
{

```

```
    P1=0xff; //P1 is connected to ADC
    rd=1;
    wr=0; //L-H PULSE
    wr=1;
    while(intr==1);
    rd=0; //H-L PULSE
    return P1;
}
void delay(int n)
{
    for(j=0;j<=n;j++);
}
```