MICROCONTROLLER

1) Drive a stepper motor interface to rotate the motor in clockwise by N steps, introduce suitable delay between successive steps.

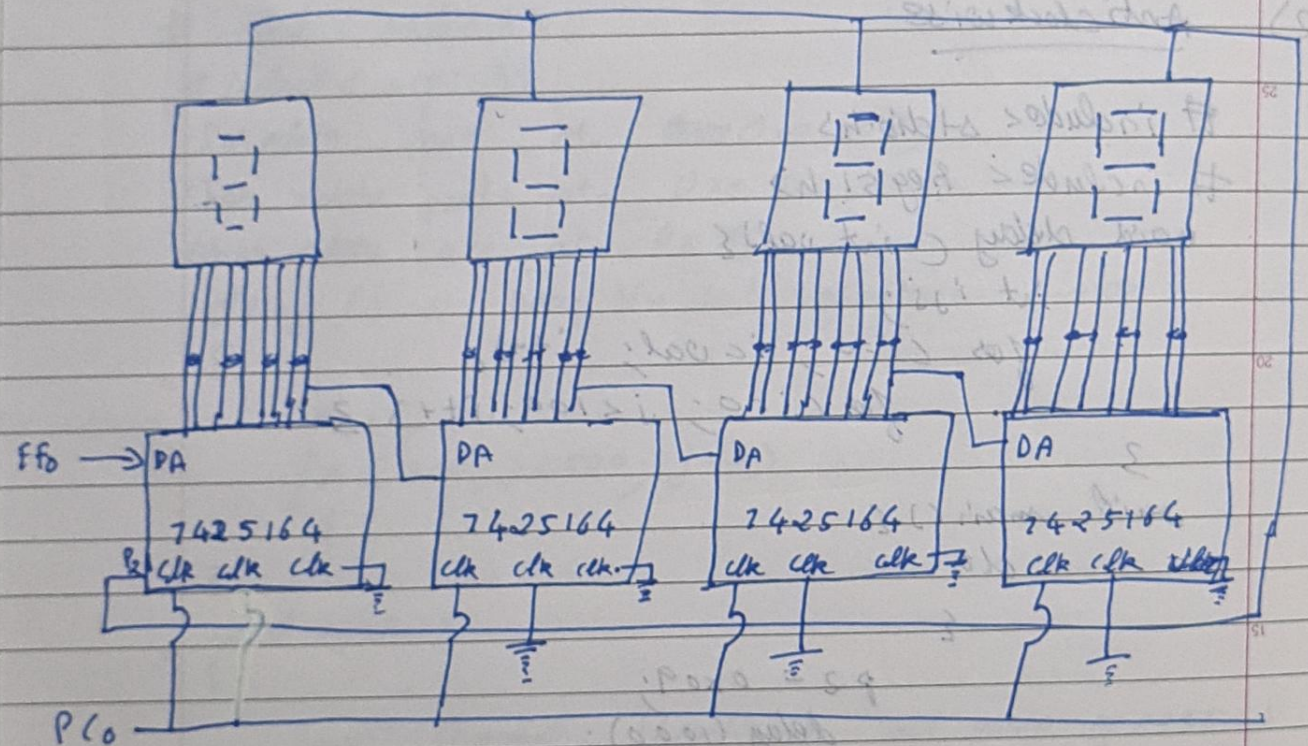
```
#include<stdio.h>
#include<reg51.h>
char xdata port _at_ 0xc803;
char xdata porta _at_ 0xc800;
char idata acc _at_ 0x30;
 delay () // Delay b/w rot of steppes motor
 {
    int j;
    for(j=0; j<800; j++)
     {}
}
void main()
{
     port=0x80; //configure all porta of 8255 as
                //  O/P port.
     while (1)
     {
       acc=0x11;
       porta = acc;
       delay();
        acc=0x22;
       porta = acc;
        delay();
        acc=0x44;
        porta=acc;
        delay();
         acc=0x88;
```

```
        p0=a=acc;
        delay();
    }
}
```

2) Anticlockwise

```
#include<stdio.h>
#include<reg51.h>
void delay(int val){
    int i,j;
    for(i=0;i<val;i++){
        for(j=0;j<100;j++);
    }
}
void main(){
    do
    {
        p2=0x09;
        delay(1000);
        p2=0x0C;
        delay(1000);
        p2=0x06;
        delay(1000);
        p2=0x03;
        delay(1000);
    }while(1);
}
```

3) Display messages FIRE & HELP alternately with flickering effects on a 7-segment display interface for suitable period of time. Ensure a flashing rate that makes it easy to read both messages.



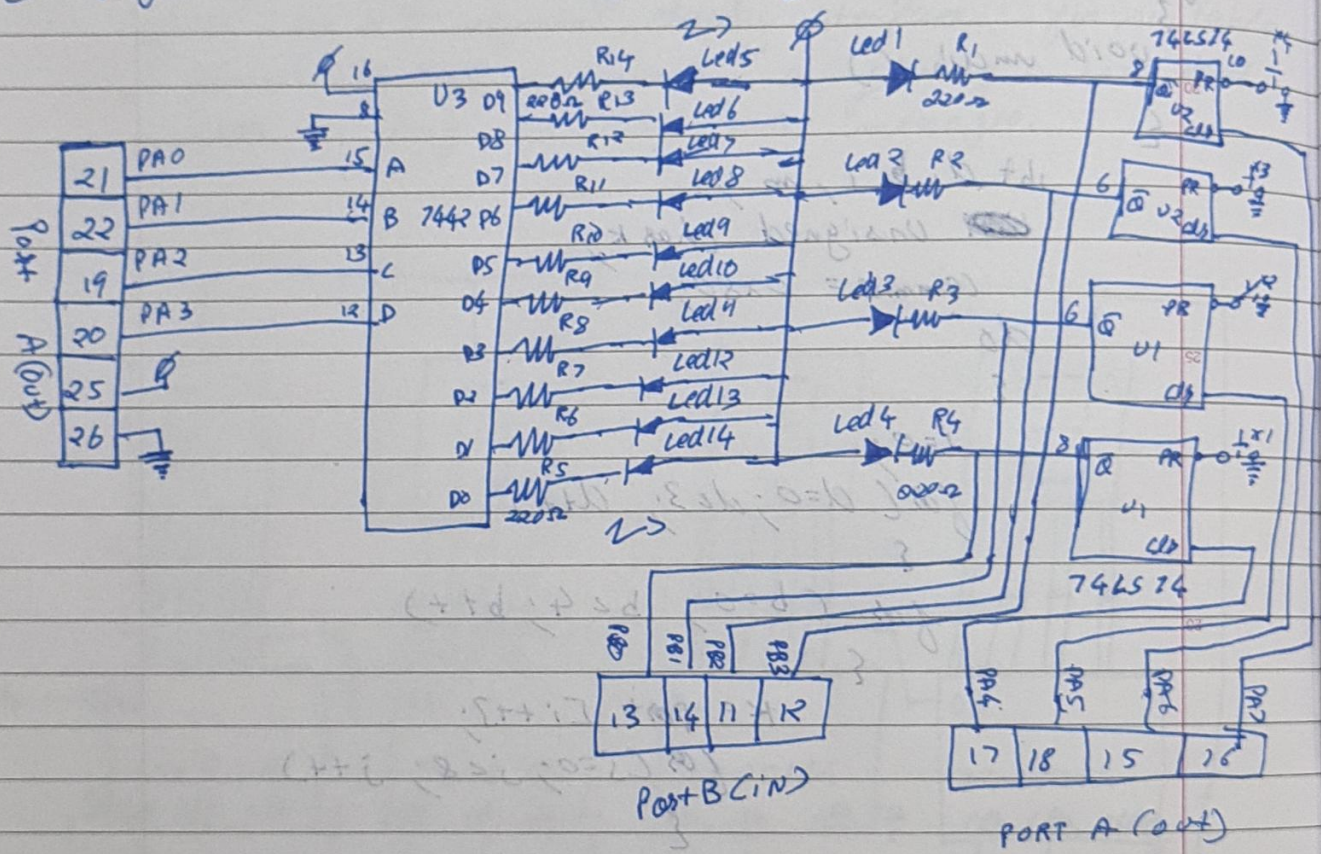

```
#include <[redacted]stdio.h>
#include<reg51.h>

Char xdata comm@ -at- 0xe803;
char xdata portB _at- 0xe801;
char xdata portC _at- 0xe802;
Char port [20] = {0x8e, 0x79, 0xde, 0x86, 0xff, 0xff, 0xff,
                  0x89, 0x86, 0xc7, 0x8c};, i;

delay ()
{
    long u;
```

```
for(v=0; v<8000; v++);
}
void main()
{
int d, b, j, m;
unsigned char k;
comm = 0x80;
do
{
i=0;
for(d=0; d<3; d++)
{
for(b=0; b<4; b++)
{
k = port[i++];
for(j=0; j<8; j++)
{
m = k;
k = k & 0x80;
{
if(k==00)
port B = 0x00;
else
port B = 0x01;
}
port C = 0x01;
port C = 0x00;
k = m;
k <<= 1;
}
}
delay();
} while(1); }
```

⑤ program to demo elevator interface.




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

unsigned char xdata commandword _at_ 0xe803;
Unsigned char xdata PortA _at_ 0xe800;
unsigned char xdata PortB _at_ 0xe801;
unsigned char xdata PresentFloor, RequestedFloor, Step = 0x00;
unsigned long xdata count, i;

Delay()
{
  for (count = 0; count <= 4500; count++) {}
    return 0;
}
```

```
Reset ()
{
    step = step & 0x0f;
    Port A = step;
    step = step | 0xf0;
    Port A = step;
        return 0;
}
GoUp()
{
    switch (RequestedFloor)
    {
        case 0x0d: while (step<0xf3)
        {
            step++;
            Port A = step;
            Delay();
        }
        Reset();
        break;
        case 0x0b: while (step<0xf6)
        {
            step++;
            Port A = step;
            Delay();
        }
        Reset();
        break;
        case 0x07: while (step<0xf9)
        {
            step++;
```

```
        Port A= Step;
        Delay();
      }
      Reset();
      break;
    }
  }
godown()
{
    switch( RequestedFloor)
    {
      case 0x0d: while( step >0x03)
      {
        step--;
        Port A =Step;
        Delay();
      }
      Reset();
      break;

    case 0x06: while( step >0x06)
          {
            step --;
            Port A= step;
            Delay();
          }
          Reset();
          break;

    case 0xDe : while (step >0x00)
          {
            step --;
            Port A = step;
```

```
        Delay();
    }
    Reset();
    break;
  }
}

void main()
{
  CommandWord = 0x82;
  PortA = 0xf0;
  PresentFloor = 0x0e;
  while(1){

    RequestedFloor = PortB;
    RequestedFloor = RequestedFloor & 0x0f;

    if(RequestedFloor != 0x0f && RequestedFloor != PresentFloor)
    {     if(RequestedFloor < PresentFloor)
              GoUp();
          else
              GoDown();
          PresentFloor = RequestedFloor;
    }
    RequestedFloor = PortB;
  }
}
```

④ Seven-Segment display - display "BCngalurea" in scrolling function.

```
#include<stdio.h>
#include<reg51.h>
char xdata comm_w _at_ 0xc803;
char xdata Port_B _at_ 0xc801;
char xdata Port_C _at_ 0xc802;
char port[20] = {0xff, 0xff, 0xff, 0xff, 0x83, 0x88,
                 0xc8, 0x82, 0x88, 0xc7, 0xc0,
                 0xAF, 0x86}, i;

delay()
{
    long a;
    for(a=0; a<4000; a++) {}
}
void main()
{
    int d, b, i, m;
    unsigned char k;
    comm_w = 0x80;
    do
    {
        i=0;
        for(d=0; d<1; d++)
        {
            for(b=13; b>0; b--)
            {
                delay();
                k = port[i++];
                for(j=0; j<8; j++)
                {
```

```
        m = k;
        K = K & 0x80;
        {
            if (K == 00)
              portB = 0x00;
            else
              portB = 0x01;
        }
          portC = 0x01;
          portC = 0x00;
          K = m;
          K << = 1;
      }
    }
    delay();
  }
}
while(1);
}
```