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Batch : 2

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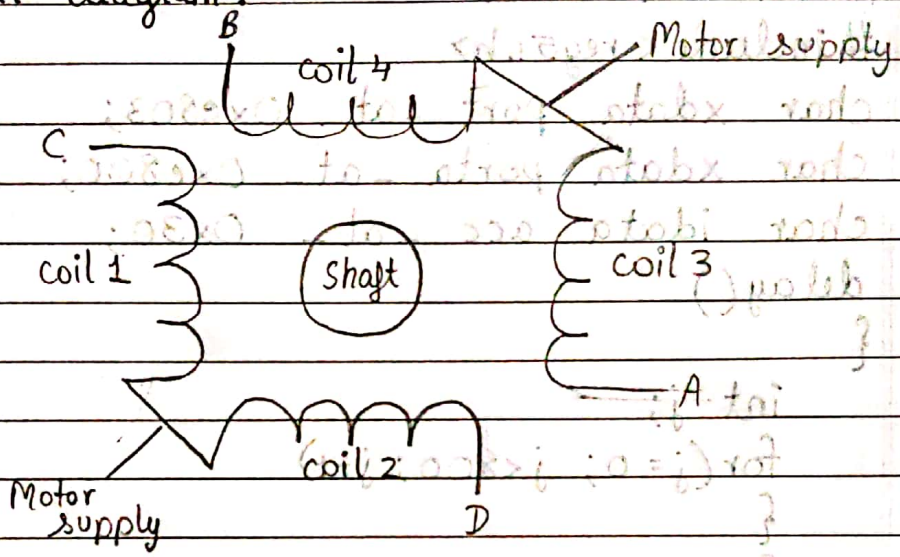
1. Drive a Stepper motor interface to rotate the motor in Anti-Clockwise by N steps. Introduce suitable delay between successive steps

Wave drive program : [Anti-Clockwise]

```
#include <stdio.h>
#include <reg51.h>
char xdata port _at_ 0xe803;
char xdata porta _at_ 0xe800;
char idata acc _at_ 0x30;
delay()
{
    int j;
    for(j=0; j<800; j++)
    {
    }
}
void main()
{
    port = 0x80;
    while(1)
    {
        acc = 0x11;
        porta = acc;
        delay();
        acc = 0x22;
        porta = acc;
        delay();
        acc = 0x44;
        porta = acc;
        delay();
        acc = 0x88;
```

```
        porta = acc;
        delay();
    }
}
```

Circuit diagram:



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2. Drive a Stepper motor interface to rotate the motor in clockwise by N steps. Introduce suitable delay between successive steps

Wave drive program : [Clockwise]

```
#include <stdio.h>
#include <reg51.h>
char xdata port _at_ 0xe803;
char xdata porta _at_ 0xe800;
char idata acc _at_ 0x30;
delay()
{
    int j;
    for(j= 0; j<800; j++)
    {
    }
}
void main()
{
    port = 0x80;
    while(1)
    {
        acc = 0x88;
        porta = acc;
        delay();
        acc = 0x44;
        porta = acc;
        delay();
        acc = 0x22;
        porta = acc;
        delay();
        acc = 0x11;
```

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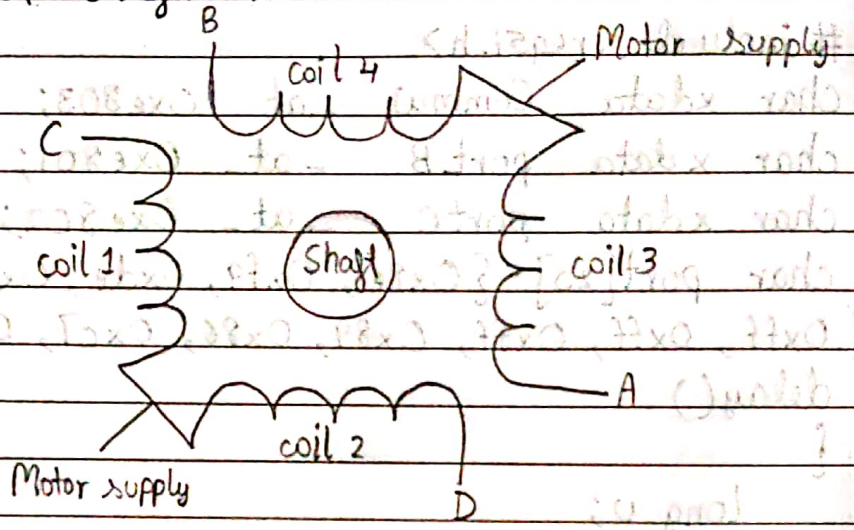
```
        porta = acc;
        delay();
    }
}
```

Circuit diagram:



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

```
#include <stdio.h>
#include <reg51.h>
char xdata Comm1 _at_ 0xe803;
char xdata portB _at_ 0xe801;
char xdata portC _at_ 0xe802;
char port[20]={0x8e, 0xf9, 0xde, 0x86, 0xff,
0xff, 0xff, 0xff, 0x89, 0x86, 0xc7, 0x8c}, i;
delay()
{
    long u;
    for(u=0; u<8000; u++)
    {
    }
    return 0;
}
void main()
{
    int b, d, j, m;
    unsigned char k;
    Comm1 = 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)
                    portB = 0x00;
                else
                    portB = 0x01;
                }
                portC = 0x01;
                portC = 0x00;
                k = m;
                k<<=1;
            }
        }
        delay();
    }
}
while(1);
}
```

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4. Display message BANGALORE in rolling fashion on a 7-segment display interface for a suitable period of time.

```
#include <stdio.h>
#include <reg51.h>
char xdata CommW _at_ 0xc803;
char xdata portB _at_ 0xc801;
char xdata portC _at_ 0xc802;
char port[20] = { 0xff, 0xff, 0xff, 0xff,
  0x83, 0x88, 0xc8, 0x82, 0x88, 0xc7, 0xc0,
  0xaf, 0x86}, i;
delay()
{
    long u;
    for(u=0; u<4000; u++);
    return 0;
}
void main()
{
    int d, b, j, m;
    unsigned char k;
    CommW = 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++)
```

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

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5. Program to demo the 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 = 0xf0;
unsigned long xdata Count, i;
Delay()
{
    for(Count = 0; Count <= 4500; Count++); return 0;
}
Reset()
{
    Step = Step & 0x0f;
    PortA = Step;
    Step = Step | 0xf0;
    PortA = Step;
    return 0;
}
GoUp()
{
    switch (RequestedFloor)
    {
        case 0x0d: while(Step < 0xf3)
                   {
                       Step++;
                       PortA = Step;
                       Delay();
                   }
                   Reset();
                   break;
```

```
        case 0x0b: while (Step < 0xf6)
                   {
                       Step++;
                       PortA = Step;
                       Delay();
                   }
                   Reset();
                   break;
        case 0x07: while (Step < 0xf9)
                   {
                       Step++;
                       PortA = Step;
                       Delay();
                   }
                   Reset();
                   break;
    }
    return 0;
}
GoDown()
{
    switch (RequestedFloor)
    {
        case 0x0d: while (Step > 0xf3)
                   {
                       Step--;
                       PortA = Step;
                       Delay();
                   }
                   Reset();
                   break;
        case 0x0b: while (Step > 0xf6)
                   {
                       Step--;
```

```
                    PortA = Step;
                    Delay();
                }
                Reset();
                break;
        case  0x0e : while (Step > 0xf0)
                {
                    Step--;
                    PortA = Step;
                    Delay();
                }
                Reset();
                break;
    }
    return 0;
}
Void main()
{
    CommandWord = 0x82;
    PortA = 0xf0;
    Presentfloor = 0x0e;
    while(1)
    {
        Requestedfloor = PortB;
        Requestedfloor = Requested floor & 0x0f;
        if(Requested floor != 0x0f &&
                    Requested floor != Presentfloor)
        {
            if( Requestedfloor < Presentfloor)
                GoUp();
            else
                GoDown();
            Presentfloor = Requestedfloor;
        }
        Requestedfloor = PortB;
    }
}
```