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EXPERIMENT-10

PROGRAMS ON LCD (HARDWARE)

AIM: To execute the following programs on LCD by using 8051 tool-kit and Keil software.

TOOLS USED:

- 8051 tool-kit
- LCD display
- Keil software

TASK-1:

Program to display "SENSE" in the first row of the LCD all characters at once (8BIT MODE).

```
#include <reg51.h>
void LCD_CMD(unsigned char CMD);
void LCD_DATA(unsigned char DATA);
void DELAY_ms(unsigned char j);
sbit RS= P3^7;
sbit RW= P3^6;
sbit EN= P3^5;
void main()
{
P2=0x00;
datapins D0-D7
LCD_CMD(0x01);
DELAY_ms(5);
LCD_CMD(0x0E);
DELAY_ms(5);
LCD_CMD(0x38);
DELAY_ms(5);
LCD_CMD(0x80);
DELAY_ms(5);
LCD_DATA('S');
LCD_DATA('E');
LCD_DATA('N');
LCD_DATA('S');
LCD_DATA('E');
```

```
25  while(1);
26  }
27  void LCD_CMD(unsigned char CMD)
28  {
29  P2=CMD;
30  RS=0;
31  RW=0;
32  EN=1;
33  DELAY_ms(5);
```

```
34  EN=0;
35  }
36  //Port used to connect LCD
37  //Clear the display screen
38  //Display on, cursor blinking
39  //2 lines, 5x8 matrix, 8bit mode
40  //Force the cursor to the beginning of the 1st line
41  void LCD_DATA(unsigned char DATA)
42  {
43  P2=DATA;
44  RS=1;
45  RW=0;
46  EN=1;
47  DELAY_ms(5);
48  EN=0;
49  }
50  void DELAY_ms(unsigned int j)
51  {
52  unsigned int i;
53  for(;j>0;j--)
54  {
55  for(i=250;i>0;i--);
56  for(i=250;i>0;i--);
57  }
58  }
```

TASK-2:

Program to display "Welcome To VIT" in the first row and "SENSE" in 2nd row of the LCD, all characters at once (8-BIT MODE)

```c
#include <reg51.h>
void LCD_CMD(unsigned char CMD);
void LCD_DATA(unsigned char DATA);
void DELAY_ms(unsigned char j);
sbit RS= P3^7;
sbit RW= P3^6;
sbit EN= P3^5;
void main()
{
unsigned char i,message1[]={"Welcome to VIT"};
unsigned char k,message2[]={"SENSE"};
P2=0x00;
datapins D0-D7
LCD_CMD(0x01);
DELAY_ms(5);
LCD_CMD(0x0E);
DELAY_ms(5);
LCD_CMD(0x38);
DELAY_ms(5);
LCD_CMD(0x80);
//Port used to connect LCD
//Clear the display screen
//Display on, cursor blinking
//2 lines, 5x8 matrix, 8bit mode
//Force the cursor to the beginning of the 1st line
DELAY_ms(5);
   for(i=0;message1[i]!=0;i++)
    {
        LCD_DATA(message1[i]);
    }
 DELAY_ms(5);
 LCD_CMD(0xC5);  //Force the cursor to the beginning of the 1st line
 DELAY_ms(5);
```

```
34      for(k=0;message2[k]!=0;k++)
35      {
36          LCD_DATA(message2[k]);
37      }
38    while(1);
39   }
40
41   void LCD_CMD(unsigned char CMD)
42   {
43    P2=CMD;
44    RS=0;
45    RW=0;
46    EN=1;
47    DELAY_ms(5);
48    EN=0;
49   }
50
51   void LCD_DATA(unsigned char DATA)
52   {
53    P2=DATA;
54    RS=1;
55    RW=0;
56    EN=1;
57    DELAY_ms(5);
58    EN=0;
59   }
60
```

```
62   void DELAY_ms(unsigned int j)
63   {
64    unsigned int i;
65    for(;j>0;j--)
66    {
67     for(i=250;i>0;i--);
68     for(i=250;i>0;i--);
69    }
70   }
```

RESULT: The given programs on LCD have been executed using 8051 tool-kit and the outputs have been verified.

OUTPUT VERIFICATION: