

EXPERIMENT 5

AIM: To interface motor using relay with Arduino/Raspberry Pi and write a program to turn ON motor when push button is pressed.

THEORY:

A relay is an electrically operated switch that allows a low-voltage signal (from Arduino/Raspberry Pi) to control a high-voltage or high-current load (like a motor). It consists of an electromagnet (coil), a common (COM) terminal, a normally open (NO) terminal, and a normally closed (NC) terminal.

- Normally Open (NO): The circuit is open (motor OFF) by default; it closes (motor ON) when the relay is activated.
- Normally Closed (NC): The circuit is closed (motor ON) by default; it opens (motor OFF) when the relay is activated.

Working Principle:-

- I. When the **push button** is pressed, the Arduino/Raspberry Pi sends a HIGH signal to the relay module.
- II. This energizes the relay coil, closing the NO contact and allowing current to flow to the motor, turning it ON.
- III. When the button is released, the signal goes LOW, de-energizing the relay and turning the motor OFF.

Applications: -

1. Home Automation Systems
2. Smart Irrigation
3. Remote Controlled Vehicles and Drones
4. Elevators and Escalators
5. Renewable Energy Systems

To Make the motor works without relay:-

Code:

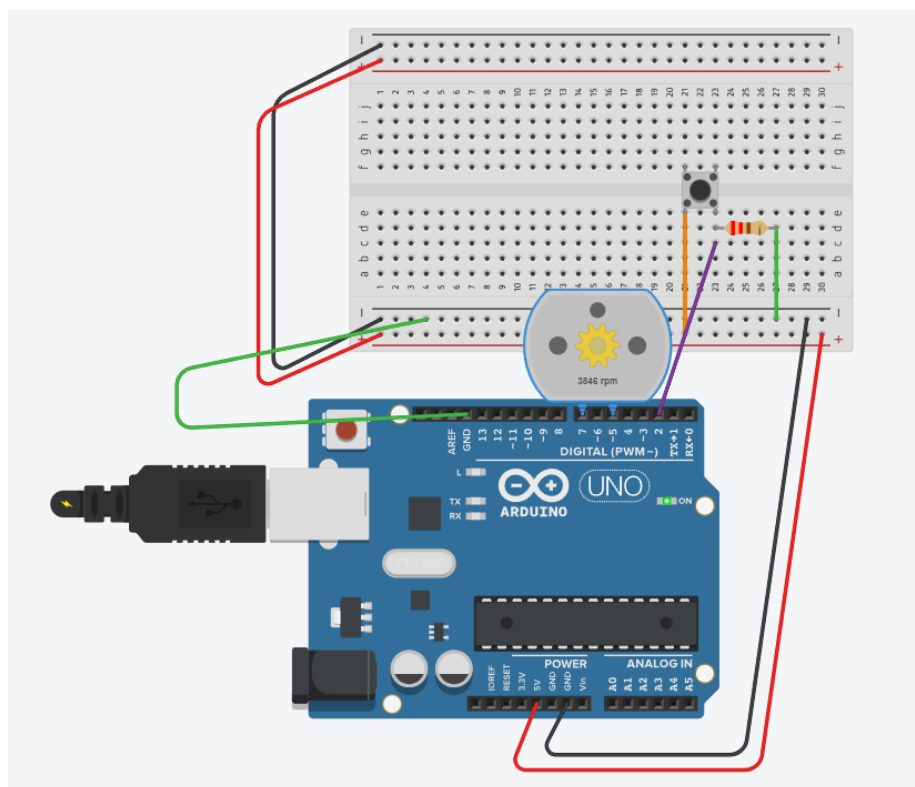
```
int pb = 2;
int m1 = 7;
int m2 = 5;
void setup()
{
  pinMode(pb,INPUT);
  pinMode(m1,OUTPUT);
```

```

pinMode(m2,OUTPUT);
}

void loop()
{
  pb = digitalRead(pb);
  if (pb == HIGH) {
    digitalWrite(m1,HIGH);
    digitalWrite(m2,LOW);
  }
  else {
    digitalWrite(m1,LOW);
    digitalWrite(m2,HIGH);
  }
  delay(5000); // Wait for 1000 millisecond(s)
}

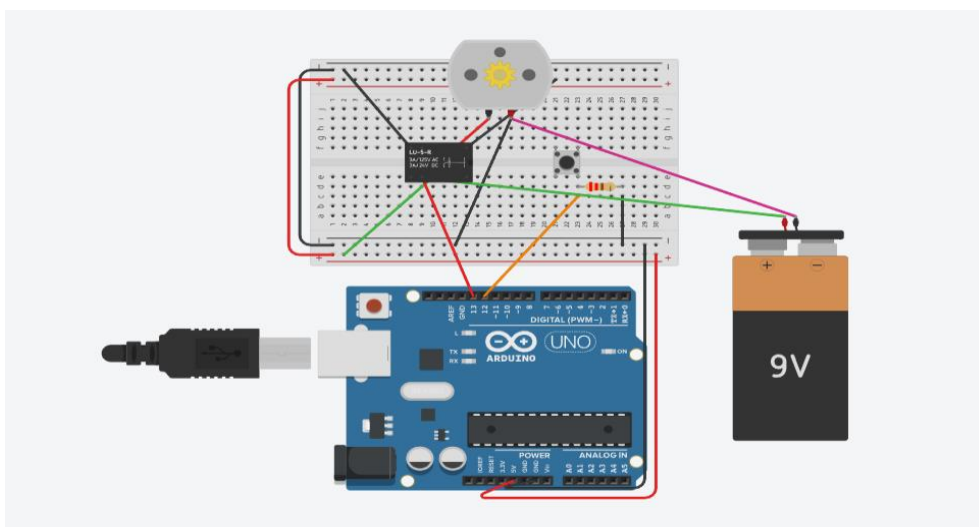
```



To Make the motor work by using relay: -

Code:-

```
int pb = 12;
int relay = 13;
void setup()
{
  pinMode(pb,INPUT);
  pinMode(relay,OUTPUT);
}
void loop()
{
  pb = digitalRead(pb);
  if (pb == HIGH) {
    digitalWrite(relay,HIGH);
  }
  else {
    digitalWrite(relay,LOW);
  }
  delay(2000);
}
```



Result: We have successfully turned On the Motor when the push button is pressed and simulated it with and without relay.