

EXPERIMENT NO:

ROLL No:

NAME:

TITLE: Interfacing of a DC motor (speed and Direction control) with arduino uno.

Theory:

The easiest and inexpensive way to control DC motors is to interface the L293D Motor Driver IC with the Arduino. It can control both the speed and the spinning direction of two DC motors. It can also control a unipolar stepper motor like the 28BYJ-48 or a bipolar stepper motor like the NEMA 17.

To have complete control over DC motor we have to control its speed and rotation direction. This can be achieved by combining these two techniques.

- **PWM** – to control speed
- **H-Bridge** – to control the rotation direction

L293D Motor Driver IC:

The L293D is a dual-channel H-Bridge motor driver capable of driving a pair of DC motors or a single stepper motor. This means it can drive up to two motors individually which makes it ideal for building a two-wheeled robotic platform.

Arduino Example code:

```
// Motor A connections
int enA = 9;
int in1 = 8;
int in2 = 7;

void setup() {
  // Set all the motor control pins to outputs
  pinMode(enA, OUTPUT);
  pinMode(in1, OUTPUT);
  pinMode(in2, OUTPUT);

  // Turn off motors - Initial state
  digitalWrite(in1, LOW);
  digitalWrite(in2, LOW);
}
```

```

void loop() {
    directionControl();
    delay(1000);
    speedControl();
    delay(1000);
}

// This function lets you control spinning direction of motors
void directionControl() {
    // Set motors to maximum speed
    // For PWM maximum possible values are 0 to 255
    analogWrite(enA, 255);

    // Turn on motor A
    digitalWrite(in1, HIGH);
    digitalWrite(in2, LOW);
    delay(2000);

    // Now change motor directions
    digitalWrite(in1, LOW);
    digitalWrite(in2, HIGH);
    delay(2000);

    // Turn off motors
    digitalWrite(in1, LOW);
    digitalWrite(in2, LOW);
}

// This function lets you control speed of the motors
void speedControl() {
    // Turn on motors
    digitalWrite(in1, LOW);
    digitalWrite(in2, HIGH);

    // Accelerate from zero to maximum speed
    for (int i = 0; i < 256; i++) {
        analogWrite(enA, i);
        delay(20);
    }

    // Decelerate from maximum speed to zero
    for (int i = 255; i >= 0; --i) {
        analogWrite(enA, i);
        delay(20);
    }

    // Now turn off motors

```

```

digitalWrite(in1, LOW);
digitalWrite(in2, LOW);
}

```

Result:

