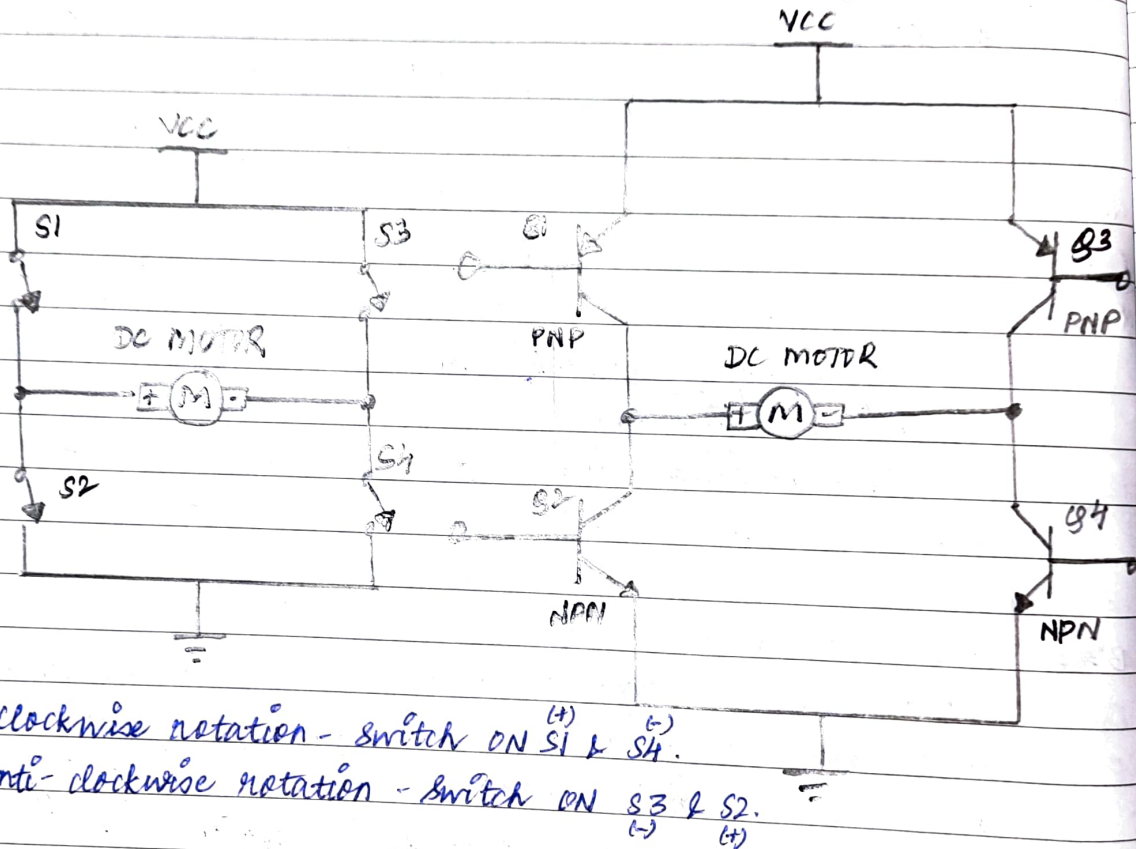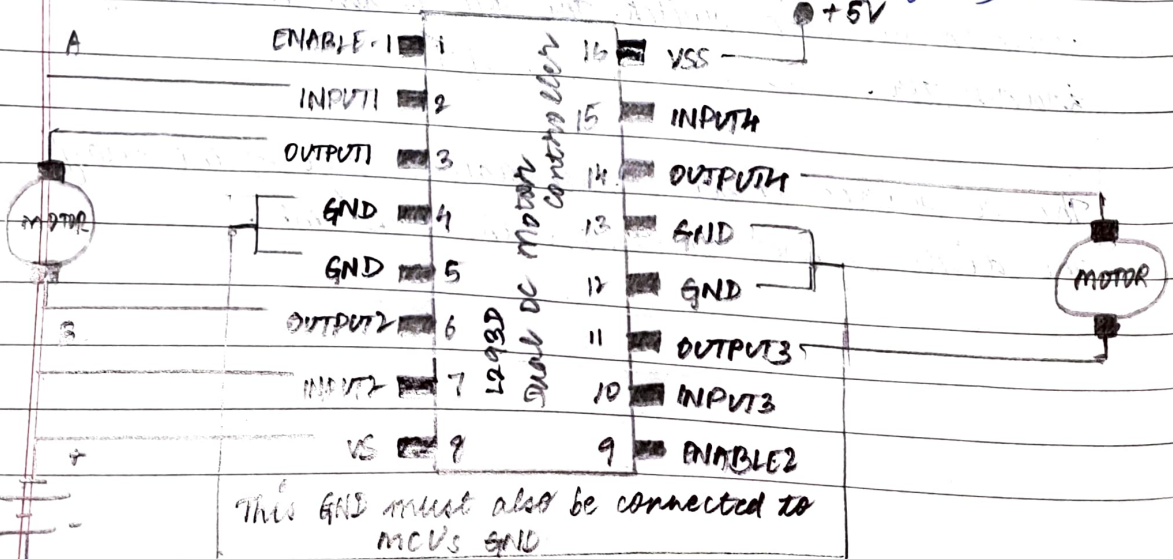# LECTURE 31 - DC MOTOR CONTROL

In the earlier lecture, we had controlled the motor using a relay. Here, we'll control the direction of the DC motor, using H Bridge

Clockwise rotation - Switch ON S1 & S4.

Anti-clockwise rotation - Switch ON S3 & S2.

Clockwise rotation - Q1 (Logic 0) & Q4 (Logic 1).

Anti-clockwise rotation - Q3 (Logic 0) & Q2 (Logic 1).

This GND must also be connected to MCU's GND

There are two H bridges which can be used to control two sc motors. All the transistors mentioned earlier are embedded in this IC. This can control the direction of two DC motors.

Pin Number 16 (VSS) acts as VCC to the IC. This is programmed as 5V since the IC works on 5V voltage supply, not 3.3V as in the earlier lectures. Four grounds are present in this IC, all of which are shorted.

Pin Number 8 (VS) is the source voltage that has to be applied to the motor. Since we are using 5V motor, we are equating VS to 5V. Input 1 and 2 are used to give input to motor 1. Similarly, input 3 and 4 are used to give input to motor 2.

The first motor is connected across output 1 and 2. Similarly, the second motor is connected across output 3 and 4. To rotate the first motor in clockwise direction, we need to give 1 and 0 as input to input 1 and 2 respectively. To rotate it in the anticlockwise direction, we need to give 0 and 1 as input to input 1 and 2 respectively.

To rotate the second motor in clockwise direction, we need to give 1 and 0 as input 4 and 3 respectively. To rotate it in the anticlockwise direction, we need to give 0 and 1 as input to input 4 and 3 respectively.

LECTURE 32 - STEPPER MOTOR CONTROL

* ## STEP ANGLE:

step Angle = 45°
Number of steps required to
complete a rotation = 8
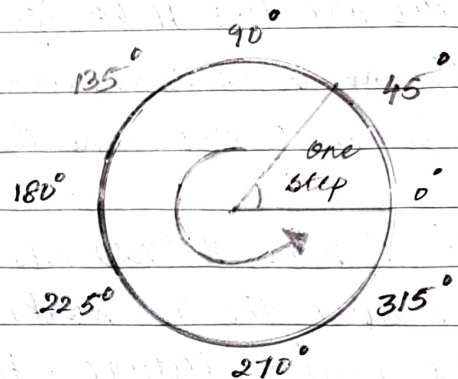
* ## UNIPOLAR STEPPER:
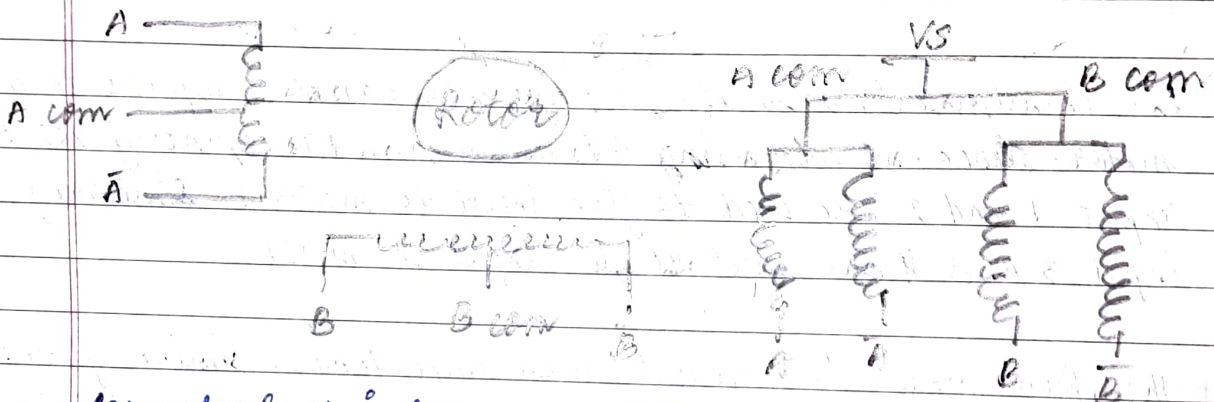
conceptual Unipolar
stepper motor Diagram

This popular configuration is used
where, motor supply is connected
to centres of both winding and
ground to each winding end is
controlled through motor driver
circuit and microcontroller.

* ## BIPOLAR STEPPER:

PTO
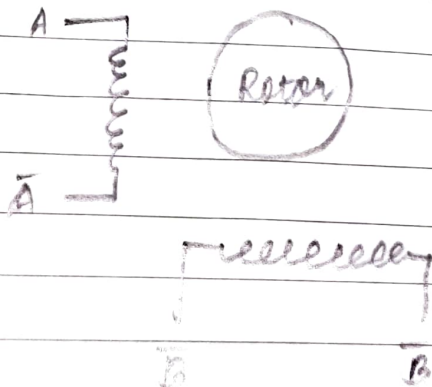
conceptual Bipolar
stepper Motor diagram

This configuration requires control of
current direction flow through each
winding to control alteration of
magnetic poles on winding required to
attract and ripple respective rotor poles.

* PERMANENT MAGNET STEPPER :
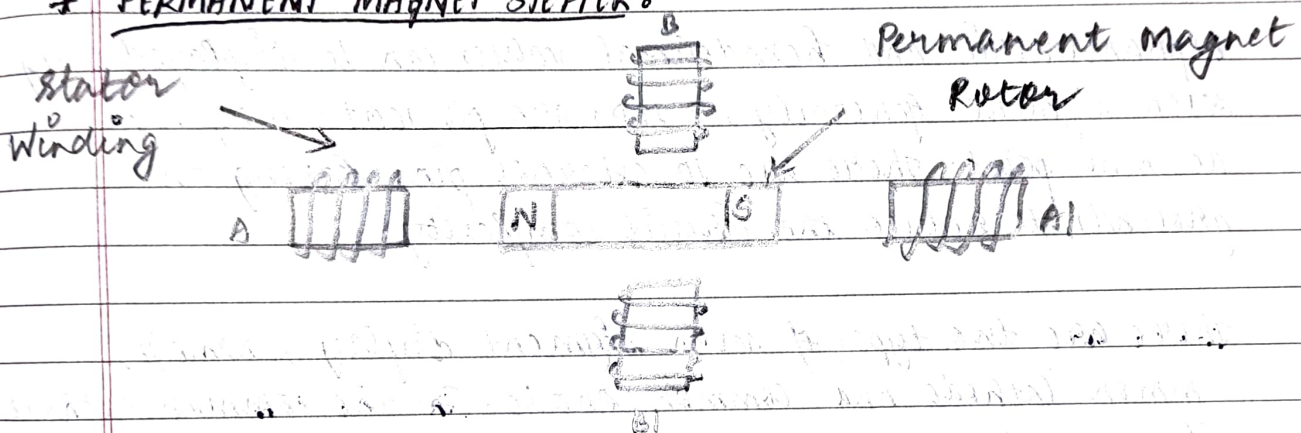
stepper motor is a brushless DC motor that divides the full
rotation angle of 360° into number of equal steps. The motor is
rotated by applying a certain sequence of control signals. The
speed of rotation can be changed by changing the rate at which
the control signals are applied.

Various stepper motors with different step angles and torque
ratings are available in the market. Microcontroller can be
used to apply different control signals to the motor to make
it rotate according to the need of the application.

To find winding coils and their centre tap leads, measure
resistance in between the leads. From centre leads we will
get half the resistance value as compared to the resistance
between winding ends.