EXPERIMENT NO: 7

ELECTRICAL ENGINEERING

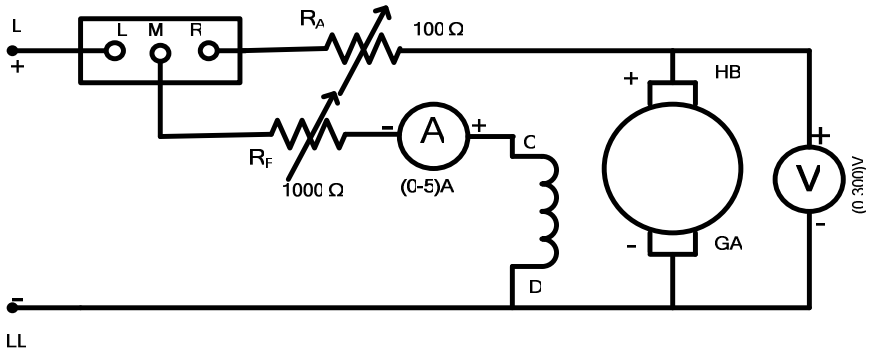
OBJECT: D.C shunt motor speed control.

AIM: To vary the speed of a given D.C. shunt motor by field control and armature control and plot the graphs of the variation of speeds.

APPARATUS REQUIRED:

(1) D.C. shunt motor
(2) One Ammeter (0-10 A DC)
(3) One Voltmeter (0-300 V DC)
(4) Rheostat, low current range 1 amp and high current range 5 amp (actual ranges of instruments will be decided after seeing the current ratings of field winding and armature winding from name plate of machines used)
(5) One Tachometer.(mechanic or non-contact type)

CIRCUIT DIAGRAM :



PROCEDURE:

FOR FIELD CONTROL: The connections are arranged as shown in the figure. Switch on the supply with starter handle in "OFF" position. Slowly increase the speed by cutting out the starter resistances until all the resistances are cut out. Now full voltage is applied across the armature. Note this value of voltage. Now by changing value of field rheostat R_F, obtain the different readings in ammeter and note down the corresponding speeds. Obtain about 6 readings. Switch off the motor and bring the starter handle back to "OFF" position.

FOR ARMATURE CONTROL: The connections are arranged in as shown in the figure. The resistance R_A should be able to with stand the no load current of motor safely, which will be about 10% of the full load current.

Start the motor. Cut off the starter resistance in steps. As there is resistance R_A in the circuit armature will not get the full voltage. Keep the field rheostat R_F in any one particular position and note down the field current. Don't disturb this setting. Now by changing R_A, obtain different speeds and note the corresponding voltage across the armature. Obtain about 6 readings

Plot the graphs- (1) speed v/s field current for field control.

(2) speed v/s armature voltage for armature control.

OBSERVATION:

For field control:

Armature voltage (V)	Field current(A)	Speed(R.P.M)

For armature control

Armature voltage (V)	Field current(A)	Speed(R.P.M)

RESULT:

PRECAUTIONS: