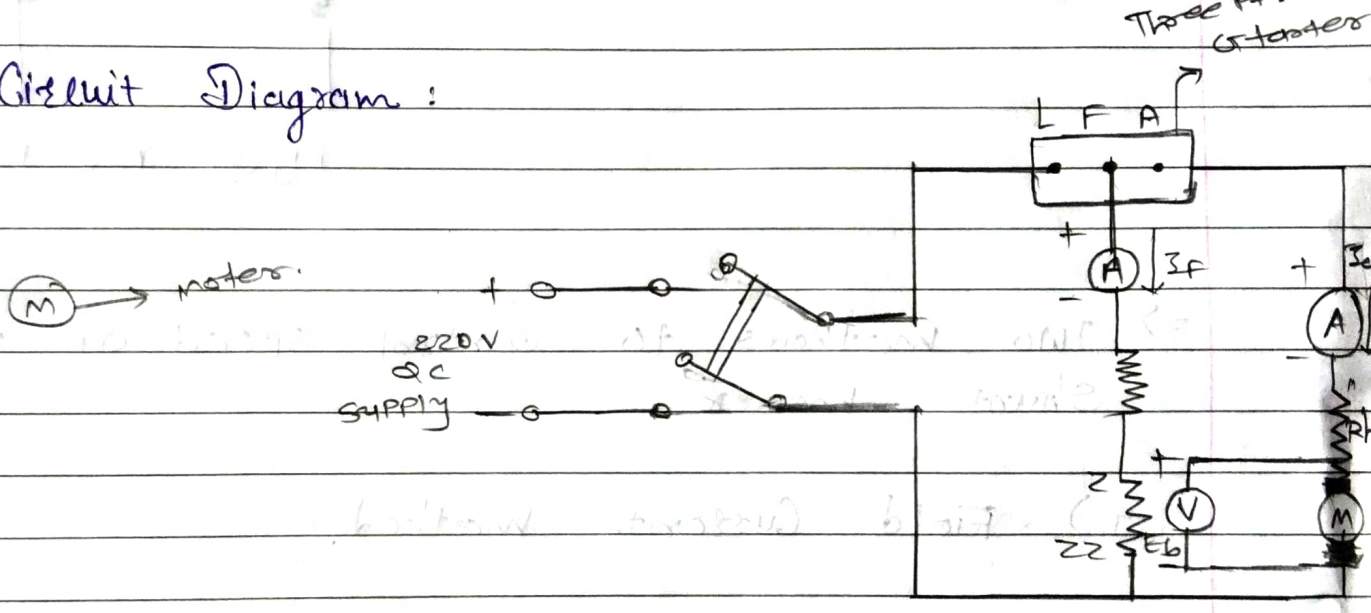
Exp - 6 ID : 20124055

Aim : To perform the exp for the speed control of DC shunt motor

Apparatus :
1) DC supply
2) Three point starter
3) Ammeter
4) Voltmeter
5) Rheostat
6) DC shunt motor

Circuit Diagram :



Theory : motor converts electrical energy into mechanical energy. firstly the supply has to given to motor & then the electrical supplay has to be given for the winding of motor

When,

Armature & field are connected in series its, knows as series motor.

And when Armature & field are Connected in parallel its known as shunt motor

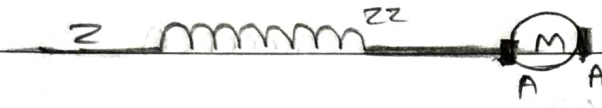


Fig ① For series.

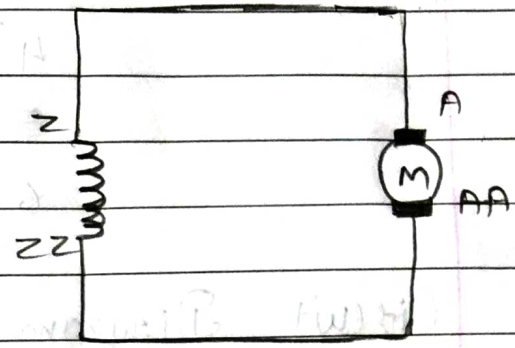


Fig ② For Parallel.

=> Two methods to control speed of dc shunt motor

1) Field Current method

-> By varying Rh-1

-> Control like field Current

-> speed of motor can't be controlled

-> keep Rh-2 at Constant pt.

2) Armature Current Control method

→ By varying Rh-2

→ Control the armature current

→ Speed of motor can be controlled

→ keep Rh-1 at constant pt.

procedure:

1) the circuit is connected as shown as the Ckt. diagram.

2) The Dc supply is switched on with min resistance in the field circuit & max value of R_1 in armature ckt.

3) Adjust the field current to normal value corresponding to the normal speed

4) Keeping f.c.c Const Voltage across armature is changed by changing R_1

5) Voltage should be kept at the rated value across the armature.

6) Keeping a.v constant field current is decreased with the help of R_2

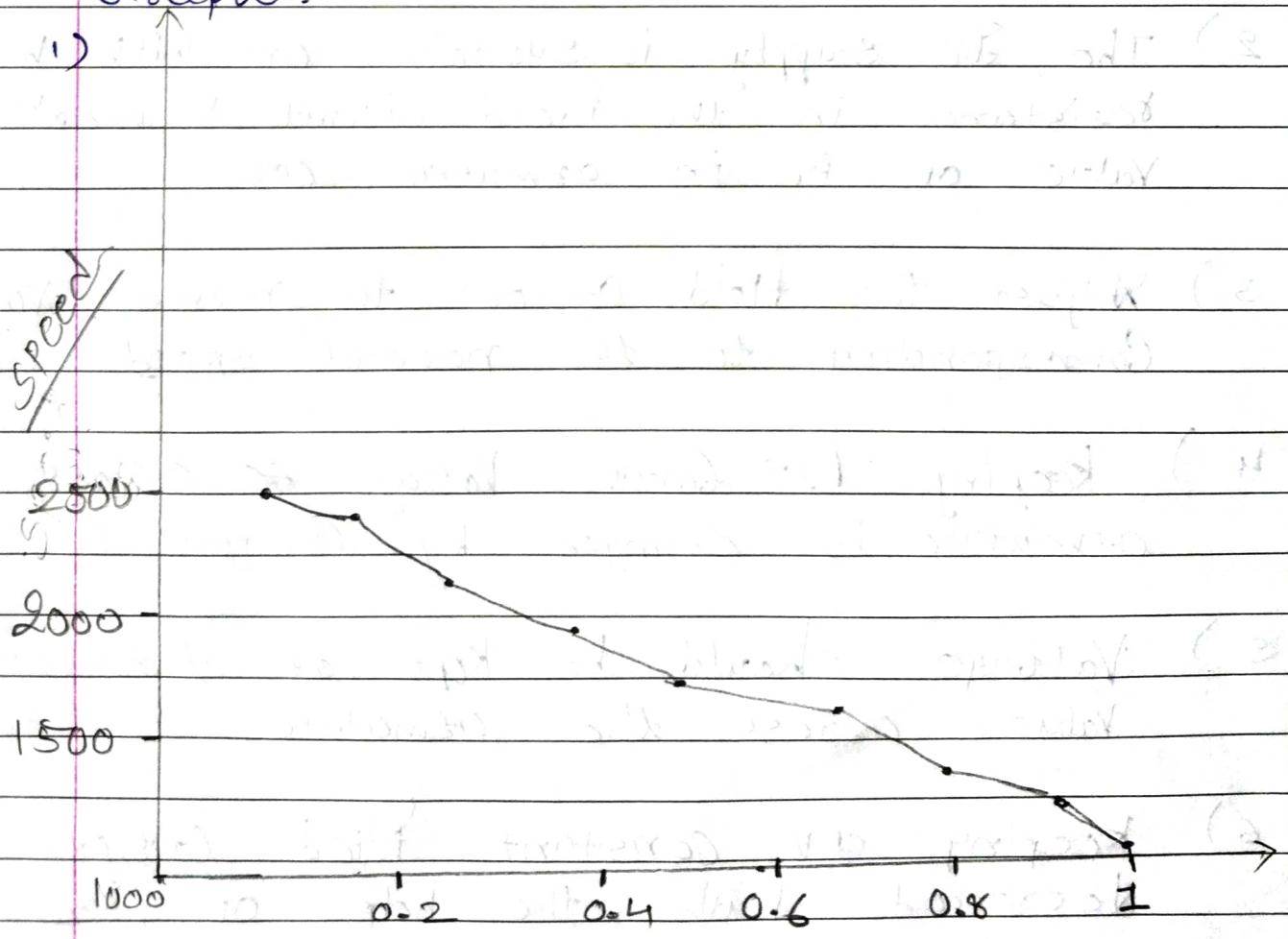
DATE
PAGE

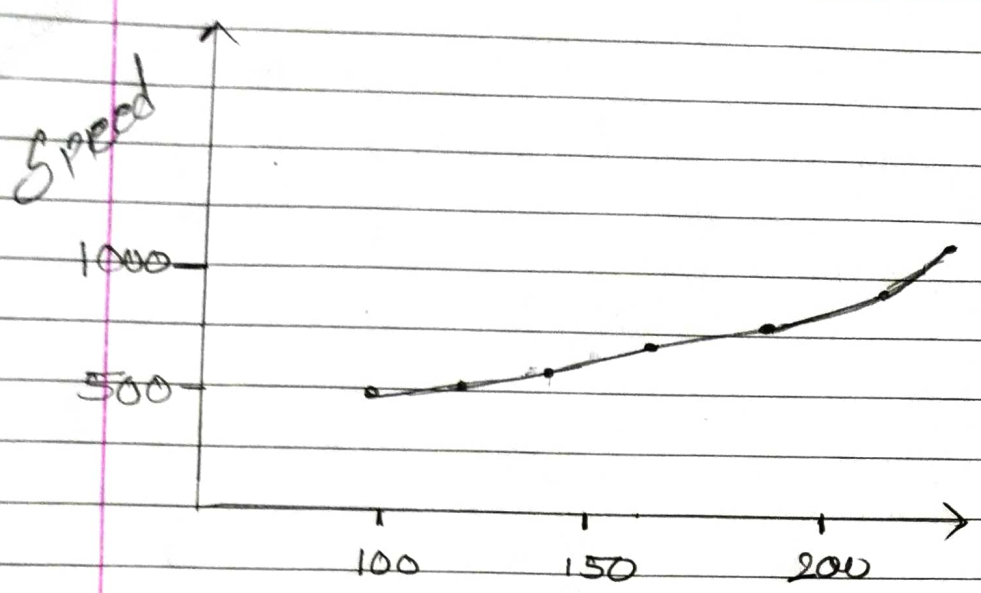
Observation table :

Sr No	FIELD Control method		Armature Control method	
	If	N (rpm)	E_b	N (rpm)
1	0.1	2500	220	~~1360~~ 1360
2	0.2	2340	200	1190
3	0.3	2100	180	1080
4	0.4	1930	160	950
5	0.5	1700	140	825
6	0.6	1575	120	690
7	0.7	1480	100	580
8	0.8	1400	100	450

Graph :

1)





Conclution :

1) When speed (rms) increases, then current If, gradually decreases so

$$\text{Speed} \propto \frac{1}{\text{current (If)}}$$

2) When speed (rms) increases, then Voltage (Eb) gradually increasess so

$$\text{Speed} \propto \text{Voltage } (E_b)$$