



***THE HASHMITE UNIVERSITY
ELECTRICAL ENGINEERING DEPARTMENT ELECTRICAL
MACHINES LAP***

Lab Sheet

Report (6)

DC-Shunt Excited Generator

Group number:	Students ID:
Moslem Naji Othman	1733045

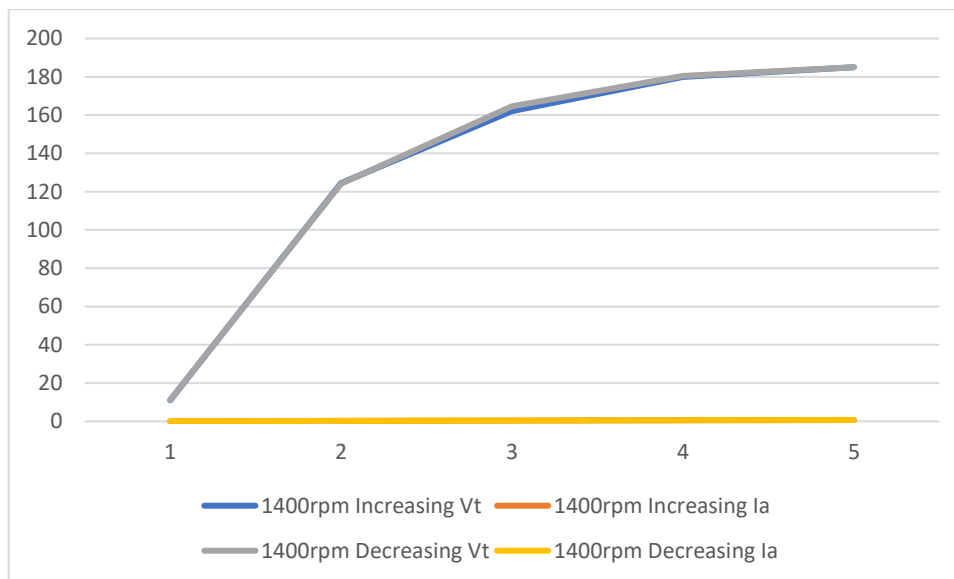
DC-Shunt Excited Generator

The no-load characteristic

Table (6- 7)

1400rpm			
Increasing		Decreasing	
Vt	Ia	Vt	Ia
11	0	11.2	0
124.5	0.2	124.2	0.2
162	0.4	164.5	0.4
180	0.6	180.5	0.6
185	0.7	185	0.7

1. Draw the no load characteristic for increasing and decreasing I_F on (x) axis at 1400 on the same graph?



2. Why does the no load characteristic differ for increasing and decreasing excitation current?

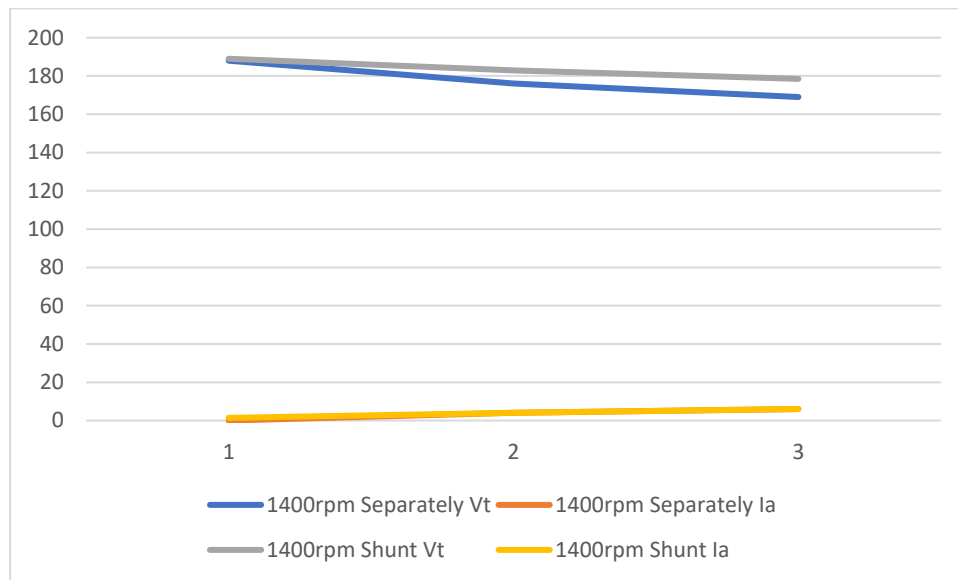
Because we have a gap between increasing and decreasing values and for the hysteresis loss occurred in the armature of the DC machine, so the field (excitation) current increase or decrease, the power factor will change and then the no load voltage characteristic will differ.

The load characteristic

Table (6-9)

I_f (A)	RPM	I_L (A)	V_t (V)
0.75	1400	0	188
0.69	1400	4	176
0.66	1400	6	169

1. Draw the external voltage characteristic separately and shunt excitation in the same diagram with I_A on (x) axis?



2. Why does V_T decrease more with shunt than with separately excitation?

In the shunt DC generator when V_t decreases, the field current in the machine decreases with it. This causes the flux in the machine to decrease, decreasing E_A causes a further decrease in the terminal voltage $= E_A - I_a R_a$

The voltage drop-off is steeper than just the $(I_a R_a)$ drop in a separately excited generator

In other word, the voltage regulation of this generator is worse than the voltage regulation of the separately excited generator.

3. Why does the generator not take up voltage in measurement if the field is wrongly connected?

The residual flux will produce an (E_a) , the voltage (E_a) produces a field current which produces a flux opposing the residual flux

In other word, the residual flux decreases and the generator does not build up voltage, so the solution is to reverse the connection of the cable.

Conclusions:

- 1) In this case we have used a different value for the excitation current to obtain different values of terminal voltage and then drawing the magnetization curve.
- 2) We have learned that the voltage regulation in shunt excited generator is worse than the separately excited generator.
- 3) In this experiment we trying to make (rpm) constant as much as possible, then we take the values that we need such as excitation currents and terminal voltages.
- 4) At load characteristic, the armature current increase and the terminal voltage decrease and vice versa.

