الهندسة	الكلية
الكهرباء	القسم
DC Machines	المادة باللغة الانجليزية
مختبر المكائن الكهربائية	المادة باللغة العربية
الثاني	المرحلة الدراسية
سامح صباح حادث	اسم التدريسي
Characteristic of Self- Excited Shunt Generator	عنوان المحاضرة باللغة الانجليزية
خصائص مولد التحويلة ذاتية الإثارة	عنوان المحاضرة باللغة العربية
التجربة الرابعه الكورس الاول	رقم المحاضرة
	المصادر والمراجع

وزارة التعليم العالي والبحث العلمي

كلية الهندسة

المرحلة الثانية

التجربة الثالثة

اعداد:

الدكتور ستار صبري كريم

المهندس ناظم منير محيسن

المهندس عبدالله فوزي شفيق

تدريس المادة: سامح صباح حادث

Experiment NO. 1:4

Characteristic of Self- Excited Shunt Generator

OBJECT :

The object of this Exp. is to verify some of the factors which effect process
of voltage build-up in a self-excited shunt generator. Also it is required to get
No-load charc. And external charc.

THEORY:

When the field is so connect to the armature that the flux produced by the
field current assist the flux of the residual magnetism then the generated voltage
build - up and the process continues until as equilibrium point is reached between
the magnetization curve and the field resistance line. When the field is
separately-excited the generator will build-up for either polarity of the field and
either direction of rotation, but when the field is self - excited, the generator does
not build - up and develop rated voltage for the following reasons:

1. Absence of residual magnetism in the poles.
2. Field circuit connections reversed with respect to the armature circuit.
3. Field circuit resistance higher than critical field resistance for the speed used,
or it can be said that the speed is less than resistance used.

PROCEDURES:

Take the name plate data of the generator used in the exp.

RUN (1) (No- Load Charac.)

1. Connect the machine as separately - excited generator (fig 1) to draw the N.L charac.

2. Run the machine at rated speed. Obtain several reading or the field current IF and Vo.c voltage at that constant speed (starting from IF = 0 until Vo.c = 180 V).

3. Return slowly back with IF to zero and switch off its circuit.

Observation Table:

N= constant

	I_F / A	Vo.c / Volt

4. Connect the machine as self - excited shunt generator at N.L (i.e. the switch is open) (fig 2), Run the machine at rated speed and take the reading of IF and Vo.c when it cases to increase .   The line connecting the point of origin of the magnetization curve to the point of voltage obtained in this item will represent V.I chara. of RF.

RUN (2): (External Charac.)

1. With connection of fig (2) at N.L (i.e. switch is open), choose Rshl which gives you Vo.c = 160V at rated speed and keep it constant.

2. Close the switch and change RL in approx. 5 equal steps, at each step take the readings of the terminal output voltage (VL) and the load current IL .Also take the reading of IF.

Observation Table:

V$_L$	I$_F$ / A	Vo.c / Volt

3. Repeat item (1) ,(2) for another Rsh2 must be less than Rshl (i.e. Vo.c = 180 V). Keeping the speed constant at the rated value and tabulate the results as below:

V$_L$	I$_L$	I$_F$

4. Repeat item (3) with Rsh2 = constant, but keeping the speed at lower than the rated speed at 1200 rpm. And tabulate the results as below:

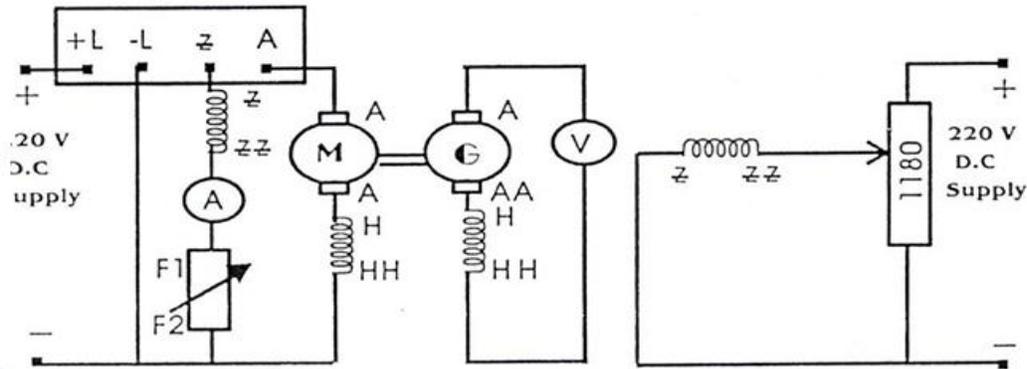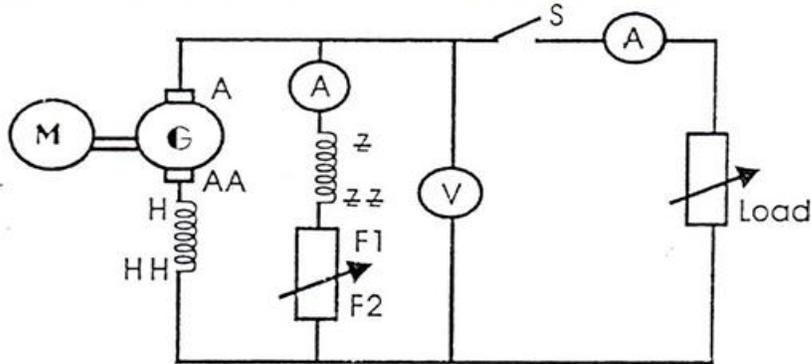| V$_L$	I$_L$	I$_F$

Fig. 1

Fig. 2

DISCUSSION:

1. Draw the N.L chara. From run (1) and calculate RF, show different lines of shunt field resistance winding.

2. Draw the external chara. Obtain from the results of run (2).

3. How can the speed effect. on the N.L chara. And the external chara. Of the shunt generator?

4. Why is the fall in the terminal voltage for the external chara. greater in shunt generator than in separately - excited generator?