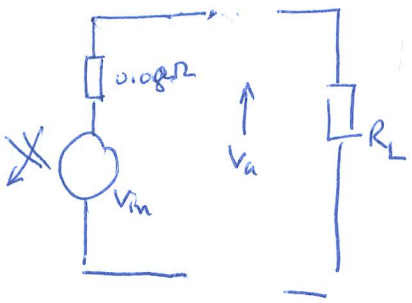
Assignment 8

1. $V_{N.L} = 131V$, $n = 5000$ rpm, $NI = 2000A$, $R_a = 0.08\,\Omega$, $I_a = 150A$



$V_a = V_{in} - I_a R_a$

$= 131 - 0.08\,(150) = \underline{119\ V}$ 10

$P_{out} = I_a V_a = 150 \times 119 = \underline{17.85\ kW}$ 10

$P_{e_{in}} = V_{in} I_a = 131 \times 150 = \underline{19.65\ kW}$ 10

$T_{e_{in}} = \frac{1}{2\pi} \frac{}{5000/60} \cdot 19650 = \underline{37.53\ Nm.}$ 10

2. From Plot : $V_{oc\ 1200\,rpm} = 770\ V$, $V_{oc\ 1000\,rpm} = \frac{770}{1200} \times 1000 = \underline{640\ V = V_{in}}$

$I_a = \frac{640}{1 + \frac{5 \times 120}{5 + 120}} = 110.3\ A$ 20

$I_s = 110.3 \times \frac{120}{120 + 5} = \underline{106\ A}$ 20

$V_s = V_{in} - I_a R_a = 640 - 110.3 \times 1 = \underline{530V}$ 20