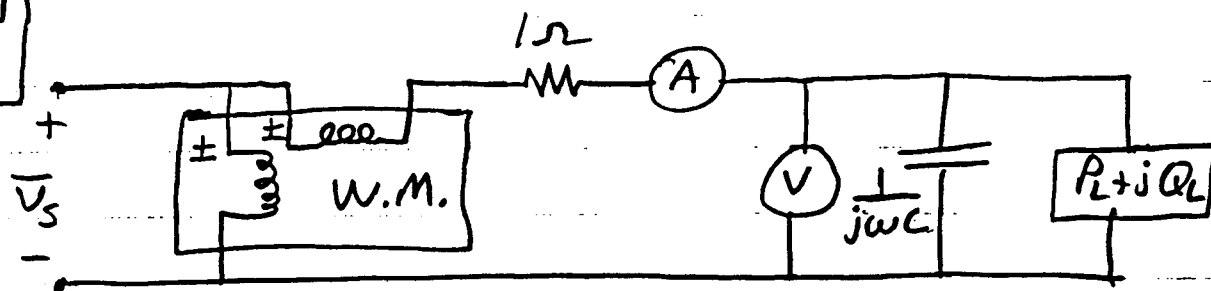


First Exam, closed book, 55 minutes, SP97

Problem #1
30 PTS



Neglect meter losses

For $\omega C = 0.1 \text{ } \Omega$,
the meters read
as shown here:

$$\begin{cases} \text{W.M.} = 456 \text{ W} \\ A = 4.0 \text{ A} \\ V = 110 \text{ V} \end{cases}$$

Find: $P_L, Q_L, |\bar{V}_s|$

Problem #2
20 PTS

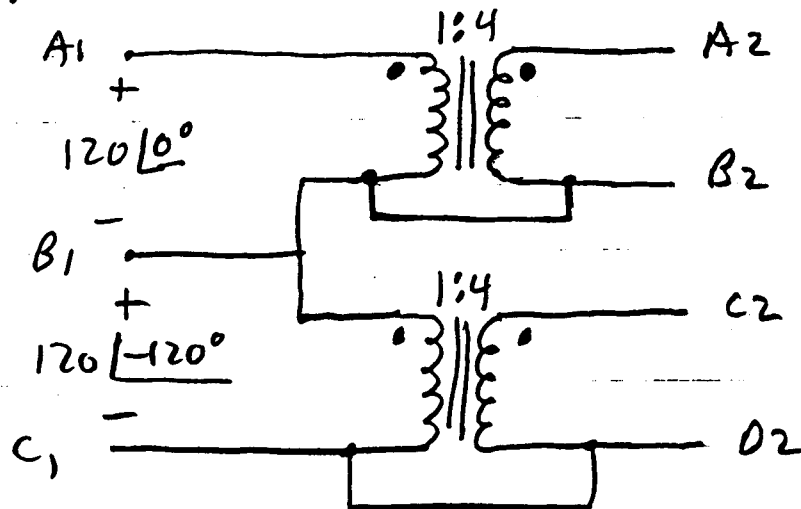
A 1ϕ Transformer shows 2400/120 volts, 4% impedance on its nameplate. The KVA rating is not legible. You decide to run a short-circuit test to determine the KVA rating.

- What voltage would you apply to the 2400 volt side in order to measure rated current?
- If the test is done correctly and you measure 10.417 A on the 2400 volt side, what is the rated KVA?
- If you accidentally short the wrong side and apply the voltage from (a) to the 120 volt side, what percent of rated current would result?

Problem #3

20 PTS

Given two single-phase transformers hooked up as shown:



Find: $\bar{V}_{A2B2}$, $\bar{V}_{B2C2}$, $\bar{V}_{C2D2}$, $\bar{V}_{D2A2}$

Problem #4

30 PTS

Given a 2HP, 6 pole, 60 Hz, 3 ϕ , 230V (l-l) induction machine with the following blocked-rotor test:

$$V_l = 36V \text{ (l-n)}, I_l = 4A, P_l = 80W$$

From this information, find estimates at the following:

- maximum possible motor torque
- maximum possible generator torque
- Starting torque
- Full-load torque

Give answers in NM