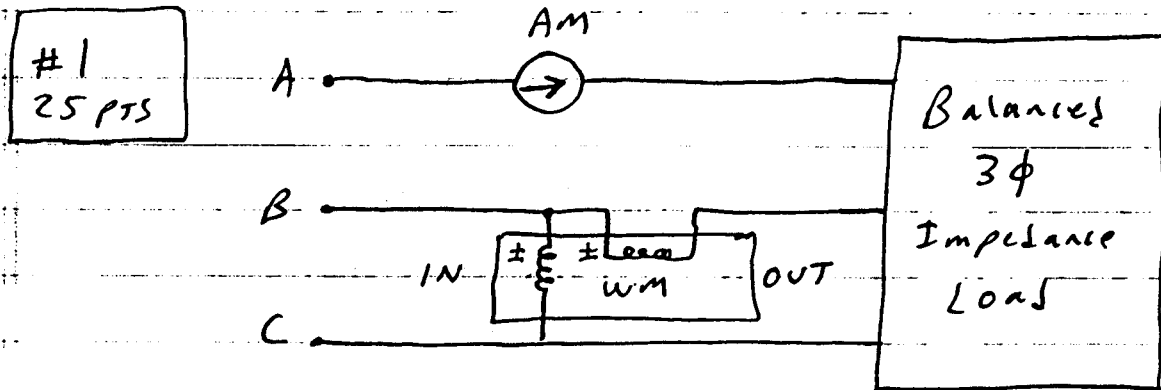


EXAM #1

Friday March 19, 1993

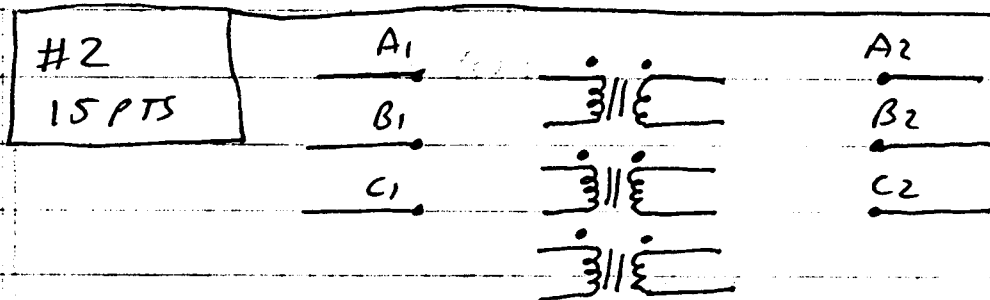
closed book, closed notes, open mind, 50 minutes

Source $\bar{V}_{AB} = 230 \angle 30^\circ$ V.RMS, Sequence ABC

AM = Ammeter reading is 15 amps RMS

WM = wattmeter reading is 400 watts

- Find: (a) The total 3 ϕ real power absorbed by the load
 (b) The total 3 ϕ reactive power absorbed by the load



The "1" side is phase sequence ABC

Redraw the transformers in your exam book
 and wire up the 3 ϕ bank in a Y Δ so
 that the "2" side is phase sequence ACB

#3
15 PTS

The short circuit test of a 10 KVA, 1 ϕ 240/120 v transformer yields the following ($1=240$, $2=120$)

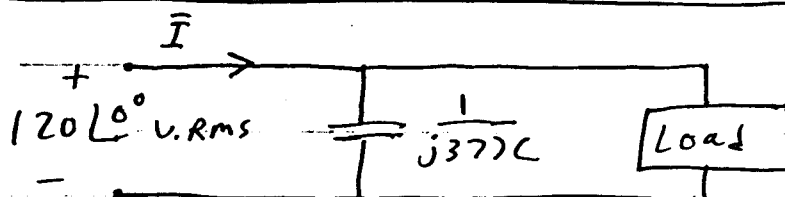
$|\bar{V}_2|=0$, $|\bar{V}_1|=30$ v, $|\bar{I}_1|=40$ A, $P_1=200$ w
Find the %Z

#4
25 PTS

A balanced 4 pole, 3 ϕ , 60 Hz, 230 v. l-l induction motor has $r_1 = x_1 = x_2' = 0$
 $r_c = \infty$, $x_\phi = 20 \Omega$, $r_2' = 1 \Omega$

- How much current will flow in each line when the machine is at no load ($s \approx 0$)?
- How much current will flow in each line when the machine is at blocked rotor ($s = 1$)?
- How much current will flow in each line when the machine is running at 1620 RPM?
- What is the frequency of the rotor currents for part (c)?

#5
20 PTS



Load is constant power 1000 w + j1000 vars

- Find:
- $\bar{I}$ with $C=0$
 - C necessary to make $\angle \bar{I} = 0$
 - $\bar{I}$ with the C from (b)