

EE 330 Energy Systems (Spring 2012)

Homework 1

Wednesday, January 25, 2012

- 1) A-1 **modified** so that the load impedances are $5 + j3.5 \Omega$ and the power lines are $220 V_{\text{rms}}$.
- 2) A-2 **modified** so that $\bar{Z}_{\text{line}} = 0.1 + j0.2 \Omega$, $\bar{Z}_{\phi_1} = 3 \angle 30^\circ \Omega$, and $\bar{Z}_{\phi_2} = 5 \angle -25^\circ \Omega$
- 3) A-6 **modified** so that $\bar{Z}_{\phi_1} = 9 \angle 30^\circ \Omega$ and $\bar{Z}_{\phi_2} = 4 \angle 32.86^\circ \Omega$
- 4) 1.18
- 5) 1.19
- 6) A 60 Hz, $220 V_{\text{rms}}$ single-phase source (assume 0 degree phase angle) is connected to two loads connected in parallel. Load 1 consumes 30 kW of power and has a power factor $pf_1 = 0.866$ lagging. Load 2 is resistive-capacitive, draws $80 A_{\text{rms}}$ of current, and consumes 12 kW of power. Determine: a) the complex power consumed, phasor current (rms) drawn by, & impedance of load 1, b) the complex power consumed by, power factor, & impedance of load 2, c) the total complex power and phasor rms current supplied by the source, and d) the overall power factor for the source.

Due Wednesday, February 1, 2012.