

**Homework Set #19****DUE Monday, April 30, 2012**

1. Problem 11.10 (9.10 in abridged version) ( $V_{AN} = 262.79\angle -2.17^\circ \text{V}$ )
2. A three-phase, 50 kVA, 600V, 60Hz generator operates at rated terminal voltage and supplies a **line current** of 48 A at a 0.8 lagging power factor to a balanced three-phase load.
  - a. Determine the real, reactive, and apparent power taken by the load.
  - b. Determine the impedance ( $\Omega/\text{ph}$ ) of the load:
    - i) if it is wye-connected,
    - ii) if it is delta-connected.
3. Problem 11.11 (9.11 in abridged version).
4. A  $3\phi$  load, supplied with 13.8kV at the load end, absorbs 20MW at 0.8 pf leading. The feeder impedance is  $0.45 + j0.9 \Omega/\phi$  (Ohms per phase).
  - a. Draw the single-phase equivalent circuit.
  - b. Find the line current.
  - c. What is the percent voltage regulation (%VR)?
  - d. Is the value obtained in part (c) usually acceptable for general industrial power systems?
  - e. What is the percent efficiency of transmission (% $\eta$ )?