EE 330 Energy Systems (Fall 2026)
Homework 7
Wednesday, October 28, 2026

1) 5-2 Let $X_S = 0.3\ \Omega$. Note: My text has typos in parts a & c, 2300 V should be 480 V.
2) 5-3abcd
3) 5-4abc
4) 5-15
5) 5-17 Assume generator is Y-connected.
6) A 16 kVA, 480 V_{rms}, 3-phase, Δ-connected, 4-pole, 50 Hz, synchronous generator has a per-unit synchronous reactance of 0.05 and a per-unit armature resistance of 0.016. If the generator is providing its rated voltage to a balanced 3-phase load with a power factor of 0.866 lagging drawing 9 kW, determine: a) synchronous reactance and armature resistance in ohms (sketch 3-phase equivalent circuit), b) armature current for phase *a* (assume output phase voltage is at an angle of 0º), c) induced voltage $\bar{E}_A$ for phase *a*, d) voltage regulation, e) total armature electrical (i.e., copper) losses, and f) machine speed in RPM.

Due Monday, November 2, 2026.