EE 330 Energy Systems (Fall 2026)
Homework 8
Monday, November 16, 2026

1) 7-2
2) 7-7
3) 7-8 Neglect P_{core} and P_{mech}.
4) 7-9 Plot all quantities versus speed n_m (RPM). Neglect P_{core} and P_{mech}.
5) 7-19 Hint: You will get two solutions for R_2, one will be unrealistic (too small).
6) A 220 V_{rms}, 60 Hz, four-pole, Y-connected, 20 hp, design class B induction motor has undergone laboratory testing yielding:

DC Test:	14 V, 46 A
No-Load Test:	220 V_{rms}, 15.3 A_{rms}, 1030 W, & 60 Hz
Locked-Rotor Test:	26 V_{rms}, 46 A_{rms}, 2000 W, & 12 Hz

For this motor: a) determine the per-phase equivalent circuit parameters R_1, X_1, R_2, X_2, & X_m, b) sketch the per-phase equivalent circuit, c) find the synchronous velocity and speed, d) plot the induced torque versus speed (RPM) curve, e) find pull-out torque τ_{max} and corresponding slip s_{max} & speed n_{max}, and f) find the start-up torque τ_{start}.

Due Monday, November 23, 2026.