

EE 330 Energy Systems (Spring 2012)

Homework 7

Tuesday, April 10, 2012

- 1) 6-1
- 2) 6-5
- 3) 6-6
- 4) 6-7 Plot all quantities versus speed n_m (RPM)
- 5) 6-23 see errata
- 6) A 220 V_{rms}, 60 Hz, four-pole, Y-connected, 20 hp, design class B induction motor has undergone no-load, locked rotor, and DC laboratory testing yielding:

No-load: 220 V_{rms}, 15.3 A_{rms}, 1030 W, & 60 Hz

Locked rotor: 26 V_{rms}, 46 A_{rms}, 2000 W, & 12 Hz

DC: 14 V, 46 A

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, April 16, 2012.