ECE 330 HW #13

In class quiz Thu, Apr 26.
Copies of the textbook are kept at the Grainger Engineering Library Reserve

Text problem 7.3

Text problem 7.4

Text problem 7.11

Special problem #1 (see solution Spring 2005 final)

A 460 Volt (line to line), 60 Hz, 3-phase, Y-connected, 4 pole Induction motor is running at rated voltage, current and speed. The speed is 1720 RPM. The stator resistance and leakage reactance may be neglected. When the motor runs at no load, the speed is approximately 1800 RPM and the stator line current (magnitude) is 6 Amps. The rotor resistance referred to the stator (R_r') is 0.8 Ohms. The rotor leakage reactance referred to the stator (X_{lr}') is 2.0 Ohms.

a) What is the frequency of the rotor currents at this operating point?
b) What is the rated line current?
c) What is the starting line current if started at full rated voltage?
d) What is the rated torque?
e) What is the maximum possible torque this motor can deliver?
f) What is the speed at which this maximum torque occurs?