ECE 330 HW 11

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

Textbook problem 7.3

Textbook problem 7.4

Textbook problem 7.11

Textbook problem 7.14

A 460 V (line-line), 60 Hz, 3-phase, Y-connected, 4 pole induction motor is running at rated voltage, current and speed. The actual machine 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 A. 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) Find the frequency of the rotor currents at this operating point.
(b) Find the rated line current.
(c) Find the starting line current if the motor is started at full rated voltage.
(d) Find the rated torque.
(e) Find the maximum possible torque the motor can deliver.
(f) Find the speed at which maximum torque occurs.