Name: Date:

Section:

ECE 431 Electric Machinery
Spring 2020

Pre-lab assignment #4

Due at the beginning of your lab session – no late Pre-lab assignments accepted.

1. List the tests that you will perform.

2 pt

load test
blocked rotor test
DC test
load test

2. What is the mechanical synchronous speed of a 6-pole induction motor being excited with a 500 Hz electrical frequency?

2 pt

$N = \frac{120f}{p} = \frac{120 \times 500}{6} = 10{,}000$ RPM

3. If a 4-pole, 60 Hz induction motor is running at 1790 RPM, what would the frequency of the rotor currents be?

3 pt

$N = 120f/p = 120 \cdot 60/4 = 1800$ RPM

$s = \frac{1800-1790}{1800} = 1/180$; $f_r = s \cdot f_e = \frac{1}{180} \cdot 60 = \frac{1}{3}$ Hz

4. For an induction motor, with six poles, operating at 60 Hz, what speeds (RPM) are associated with the following slip values?

a. s = 1

$1200(1-1) = 0$ RPM

b. s = 0

3 pt

$1200(1-0) = 1200$ RPM

c. s = 0.03

$1200(1-0.03) = 1164$ RPM