

Name:
Lab Section:

Date:

ECE 431 Electric Machinery Spring 2020

Pre-lab assignment #3

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

1. List the tests that you will perform.

2 pt

Series resistance, Inductance, max. step rate, min. required phases.

2. A 4 phase hybrid stepper motor has 6 teeth on the rotor and is driven with full stepping at a step rate of 300 steps/s. What is the step angle for this motor? What is the speed in revolutions per minute at this step rate?

4 pt

Hybrid motor includes \Rightarrow half steps.

$$S = 2 m N r = 2 \times 4 \times 6 = 48$$

$$\theta_m = \frac{360^\circ}{48} = 7.5^\circ / \text{step}$$

$$n = 300 \times 7.5^\circ / 360 \times 60 = 375 \text{ rpm.}$$

3. Create a chart similar to the one shown in Appendix A of experiment 3 in the lab manual that describes the phase excitation sequence that would be used for dual excitation full stepping of the 4 phase VR stepper motor shown.

4 pt

CCW \updownarrow CW	Phase A	Phase B	Phase C	Phase D
	x			x
			x	x
		x	x	
	x	x		

(or in reverse direction)