
QUESTION 2: SKETCHES

Are all three phases balanced (separated by 120)? No, see table.

Plots (sketches) are below:



Figure 1: 5V

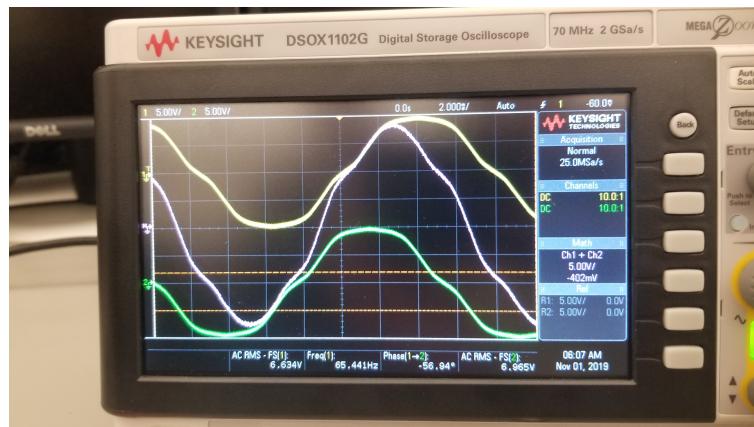


Figure 2: 10V

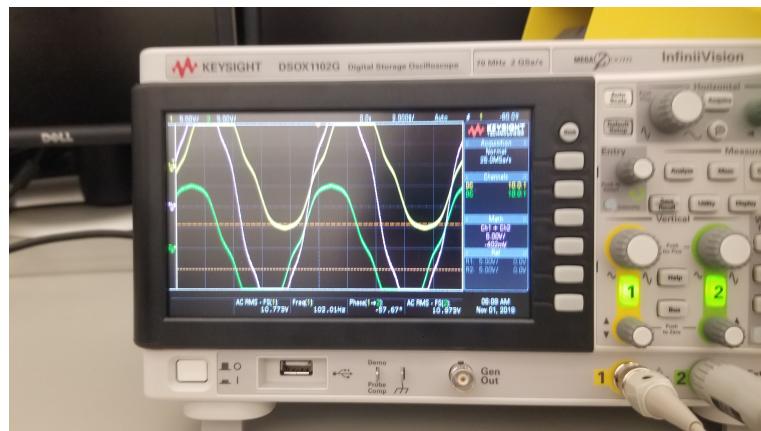


Figure 3: 15V

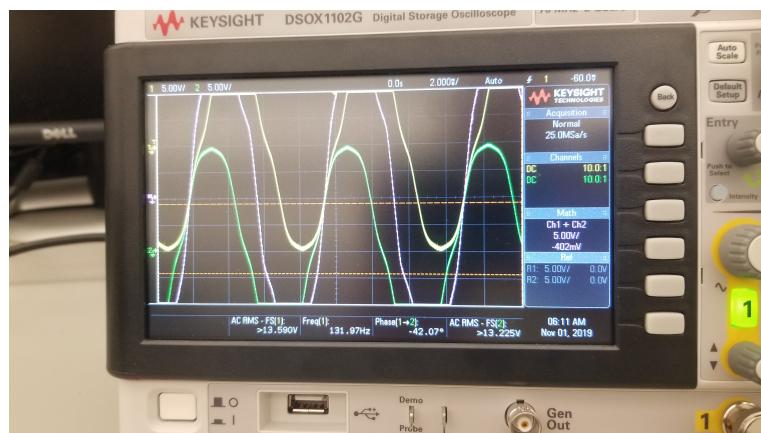


Figure 4: 19V

QUESTION 3: TABLE

Voltage (V)	Current (A)	AC RMS F_{S1} (V)	AC RMS F_{S2} (V)	Frequency (Hz)	Phase (deg)
5.004	.963	3.22	3.1640	29.3	-60
10	1.117	6.62	6.99	65.4	-59
15.01	1.191	10.763	10.98	101.9	-56
19.01	1.242	13.53	13.2	131.56	-42

QUESTION 5: RPM

$$n = \frac{f \cdot 60}{p_p/2}$$

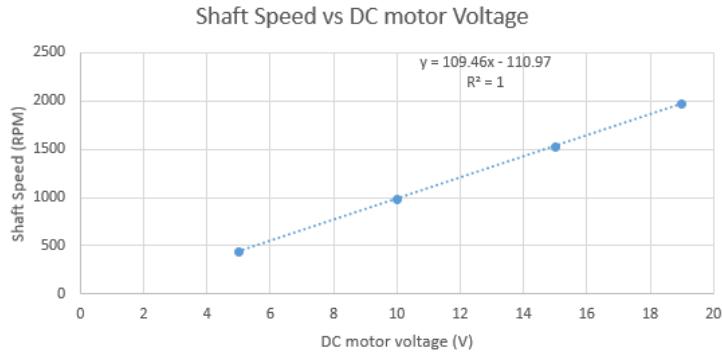
5.004 [V] : 439.5 [RPM]

10.0 [V] : 981.0 [RPM]

15.01 [V] : 1528.5 [RPM]

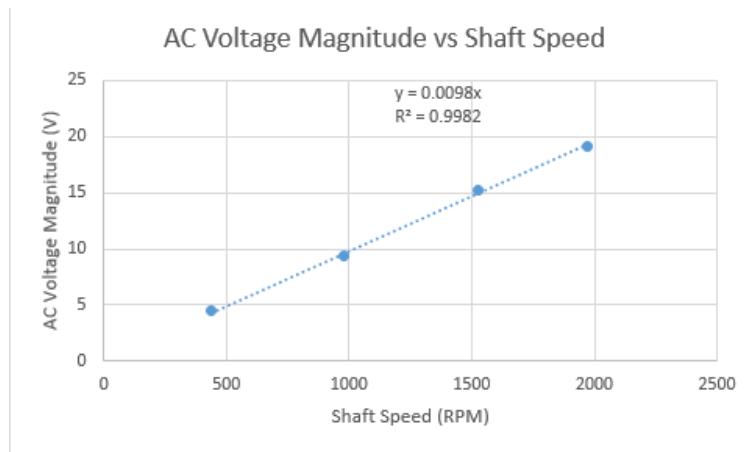
19.01 [V] : 1973.4 [RPM]

QUESTION 6: SHAFT SPEED VS DC MOTOR



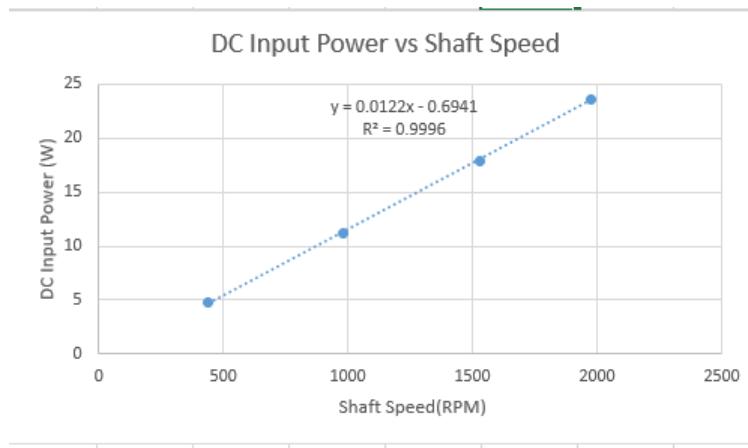
QUESTION 7: AC MOTOR VS SHAFT SPEED

$$|V_{AC}| = \sqrt{2} \cdot V_{RMS}$$



QUESTION 8: DC INPUT VS SHAFT SPEED

$$P_{total} = i_{motor} \cdot v_{motor}$$



QUESTION 9: AC POWER VS SHAFT SPEED

$$P_{dc} = 0.75 \cdot V_{motor}$$

$$P_{AC} = P_{total} - P_{DC}$$

