

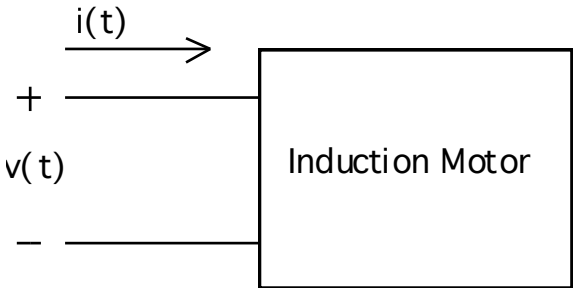
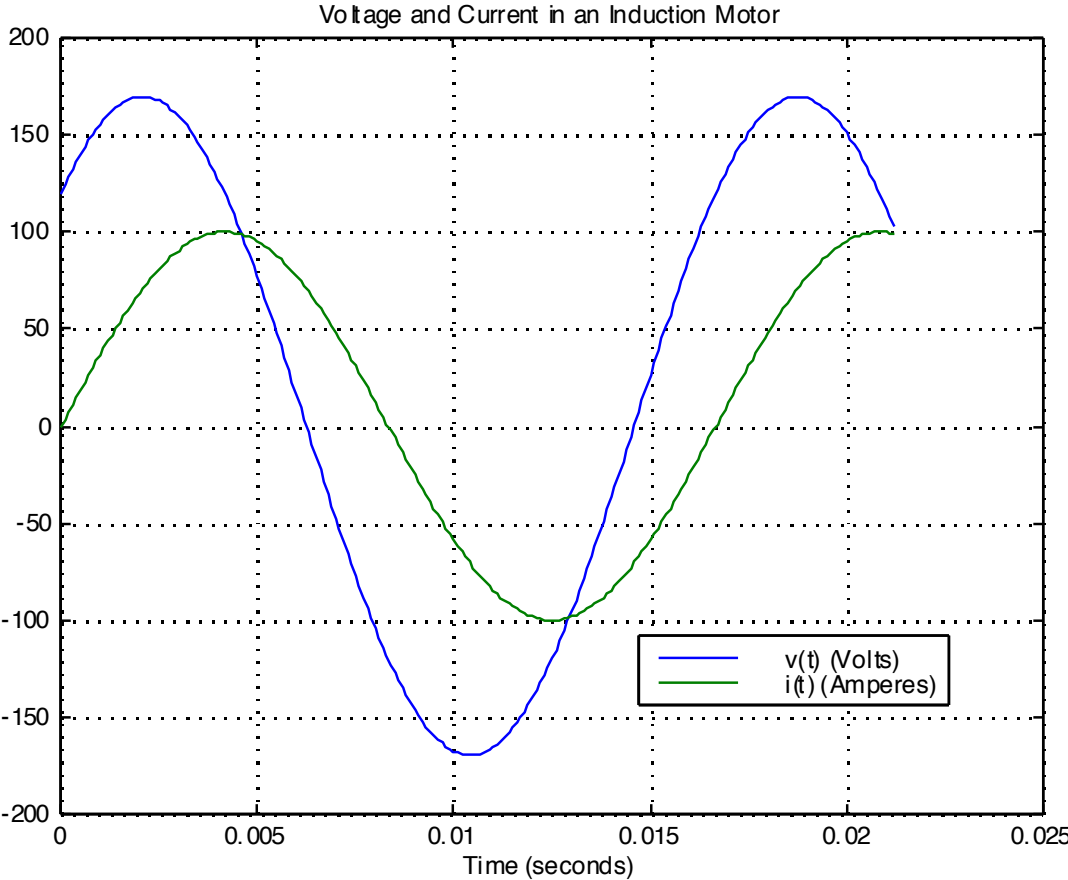
Power Factor Correction

Name \_\_\_\_\_

Grade \_\_\_\_\_/10

Introduction

The power scene surrounding an induction motor can be completely determined by analyzing the voltage and current waveforms. This prelab assignment will guide you through the calculation of various power quantities as applied to an induction motor. Remember to use your power and impedance triangles.



## Procedure

1. Estimate the frequency (in radians/second) of the voltage waveform. You will need to “eyeball” the values from the waveform.
2. Write the voltage and current expressions in sinusoidal form, i.e.  $V = V_M \cos(\omega t + \theta)$ . Again, you will need to eyeball the values from the waveforms.
3. What is the power factor angle? What is the power factor? Is it leading or lagging?
4. What average power is the motor using?
5. What reactive power is the motor using?

6. What is the apparent power?

7. What is the complex impedance of the motor?

8. What value of parallel capacitance is needed to correct the power factor to unity?