

Make sure, for **all** parts of **all** problems, show your work.  
Partial credit cannot be given without you showing your work.

Make sure all of your values have units (ohms, volts, amps, VA, W, VAR, etc.)

Given a 200 HP Three Phase Synchronous Motor rated at 460V 60Hz with 8 inductive poles, with full load current of 200A with maximum power transfer to the rotor (torque angle = 0), calculate the following:

What is the synchronous speed of the generator rotor (in RPM)?

What is the Slip?

What is the Power Factor?

What is the mechanical output (in HP) of this motor at full speed?

What is the Total impedance of this motor at Full Load (express this as magnitude and angle)?

What is the Resistive impedance of this motor at Full Load (express in ohms)?

What is the Reactive impedance of this motor at Full Load (express in ohms)?

What is the Full Load Active power drawn by this motor (express in kw)?

What is the Full Load Reactive Power drawn by this motor (express in kvar)?

How do you start this motor?

Define the following:

Slip of a Synchronous Generator

Armature of a generator

Rotating AC Field Generator (compare with the next item)

Stationary AC Field Generator (compare with the previous item)

Permanent Magnet Generator (explain the benefits of this and whether it is a Rotating AC Field Generator or a Stationary AC Field Generator)

Infinite Bus