EEET – 241 PROJECT #2

Make sure, for **all** parts of **all** problems, show your work.
For all questions below, be sure to show your work clearly.
Do not just write the answer.
Partial credit cannot be awarded without you showing your work.

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

The nameplate of an inductive motor indicates:

HP = 15
PH (Phases) = 3
Voltage = 460V
FLA = 21A
Rotational speed = 1080 RPM
Efficiency = 85%
P.F. = 85%
Service Factor = 1.05%
Enclosure = TEFC

What is the best utility voltage to operate this motor at? Hint: This is the LINE voltage that the motor will be connected to – not the rated voltage.
What is the Synchronous Speed of this motor?
How many poles does this motor have?
What is the Slip of this motor?
What is the mechanical output (in HP) of this motor at full speed?
What is the X/R ratio of the motor?
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)?