

**Homework # 1****Due: Tuesday, June 6<sup>th</sup>**

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**Question 1.** (100 points) Write a short paragraph to answer.

- a. (20 points) What are the advantages of electrical energy over other forms of energies?
- b. (20 points) Why induction motors are preferred in the industrial applications?
- c. (20 points) Why the tolerance on power system frequency is relatively very small?
- d. (20 points) Why the electrical power transmission is carried out at higher voltages?
- e. (20 points) What are the advantages of interconnected power systems?

a)

Electricity is very versatile in both use and generation and can be transported long distances at near the speed of light.

b)

Induction motors are preferred in industry because they're self starting and give constant torque.

c)

Frequency tolerances are tight because there are many power generators on the same grid, and they all need to remain in phase with each other so they work together rather than against each other.

d)

Because at a higher voltage, less current is needed to transmit the same power, and less current means less power loss from resistance in transmission lines.

e)

Some advantages of interconnected systems include reliability and the ability to share peak loads.