Electronic Variable Speed Drives 4th edition Brumbach Solutions Manual

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REVIEW QUESTIONS for CHAPTER 1

1. What are the two speeds that are associated with an induction motor?

A. Synchronous speed and rotor speed.

2. Explain the difference between the two speeds associated with an induction motor.

A. Synchronous speed is the speed at which the rotating magnetic field revolves around the stator. Rotor speed is the speed at which the rotor rotates.

3. What two factors determine the speed at which the magnetic field revolves around the stator of an induction motor?

A. The number of stator poles within the motor and the frequency of the applied AC power.

4. Explain the term "slip."

A. The difference between the rotor speed and the synchronous speed is called slip.

5. Is slip desirable or undesirable? Why?

A. Slip is desirable. Slip is what produces torque in a motor. And as slip increases, torque increases. Without slip, torque would not be produced and the motor would be useless.

6. Prior to the advent of VFDs, name four methods of speed control.

A. Pulleys, belts, sprockets, chains, gearboxes, mechanical brakes, wound-rotor induction motor, DC motor prime mover for an alternator to vary the frequency of the AC, and the VFD.

7. Name three basic types of VFDs.

A Pulse-width-modulated (PWM), current-source-inverters (CSI), and voltage-source-inverters (VSI).

8. What is the name of the section of the VFD that is connected to the three-phase power source? Describe its function.

A. The converter stage. The converter stage accepts three-phase power and rectifies the three-phase AC into direct current or DC.

9. What are three names for the section of a VFD that produces a smooth DC?

A. Filter stage, DC link, or DC bus.

10. What is the name of the section of the VFD that is connected to the motor? Describe its function.

A. The inverter stage. The inverter stage switches the DC on and off at a very high rate. This causes the DC to appear as pulses that simulate alternating current or AC.

REVIEW QUESTIONS for CHAPTER 2

1. Explain the difference between mass and weight.

A. Mass is the amount of matter contained within an object. The weight of an object is the result of the force that gravity exerts on an object.

2. Explain the difference between speed and velocity.

A. Speed is the rate of motion (how far an object moves within a specified amount of time). Velocity denotes not only the rate of motion, but the direction of the motion.

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