Chapter 26

Review Questions

1. Name two requirements that must be met before a motor can be used for wye-delta starting.
2. The stator windings of a 2300 volt motor have an impedance of 6 omega when the motor is first started. What would be the in-rush current if the stator windings were connected in delta?
3. What would be the amount of in-rush current if the motor described in question 2 had the stator windings connected in wye?
4. Refer to the circuit shown in Figure 26–9. Assume that timer TR is set for a delay of 10 seconds. When the START button is pressed, the motor starts with its windings connected in wye. After a period of 1 minute, the motor has not changed from wye to delta. Which of the following could cause this condition?
   a. TR timer coil is open.
   b. S contactor coil is open.
   c. 1M starter coil is open.
   d. The control transformer fuse is blown.
5. Refer to the circuit shown in Figure 26–9. Assume that timer TR is set for a delay of 10 seconds. When the START button is pressed, the motor does not start. After a delay of 10 seconds, the motor suddenly starts with its stator windings connected in delta. Which of the following could cause this problem?
   a. TR timer coil is open.
   b. 2M contactor coil is open.
   c. S contactor coil is open.
   d. 1M starter coil is open.
6. Refer to the circuit shown in Figure 26–9. What is the purpose of the normally closed 2M and S contacts in the schematic?
7. The motor nameplate of a wye-delta started motor has a full load current of 287 amperes. What current rating should be used to determine the proper overload heater size?
8. Refer to the circuit shown in Figure 26–14. When the motor changes from wye to delta, what causes contactor coil S to de-energize and open S contacts?
9. Refer to the circuit shown in Figure 26–14. What is the purpose of timer TR2?
10. Refer to the circuit shown in Figure 26–14. When the START button is pressed, the control transformer fuse blows immediately. Which of the following could *not* cause this problem?
    a. Control relay coil CR is shorted.
    b. Starter coil 1M is shorted.
    c. Contactor coil S is shorted.
    d. Contactor coil 2M is shorted.

Chapter 27

Review Questions

1. A dual voltage 240/480-volt motor is to be used for part winding starting. Which voltage must be used and why?
2. Are the stator windings of a motor designed for part winding starting connected in parallel or series?
3. The nameplate of a part winding motor indicates a full load current rating of 72 amperes. What current rating should be used when sizing the overload heaters?
4. What is a watchdog timer?
5. Refer to the circuit shown in Figure 27–5. When the START button is pressed, the motor does not start. Which of the following could not cause this problem.
   a. The control transformer fuse is blown.
   b. Overload contact #2 is open.
   c. TR1 timer coil is open.
   d. Control relay coil CR is open.
6. Refer to the circuit shown in Figure 27–5. When the START button is pressed, the motor does not start. After a 4-second time delay control relay CR de-energizes. Which of the following could cause this problem?
   a. TR1 timer coil is open.
   b. 1M starter coil is open.
   c. CR coil is open.
   d. 2M starter coil is open.

Chapter 28

Review Questions

1. What is the principle of operation of a direct current motor?
2. What are the three basic types of direct current motors?
3. Explain the differences between series and shunt field windings in construction and how they are connected in the motor.
4. What type of armature winding is generally used for machines designed to operate on low voltage and high current?
5. What type of direct current motor is generally referred to as a constant speed motor?
6. How can a compound motor be operated at below normal speed or under speed?
7. How can a compound motor be operated at above normal speed or over speed?
8. What is the characteristic of a motor that is flat compounded?
9. Explain the difference between cumulative and differential compounding.
10. What is the most common method of reversing the direction of rotation of a direct current motor?
11. A direct current shunt motor is to be operated in the counterclockwise direction. Should the A1 or A2 lead be connected to the F1 lead?

Chapter 29

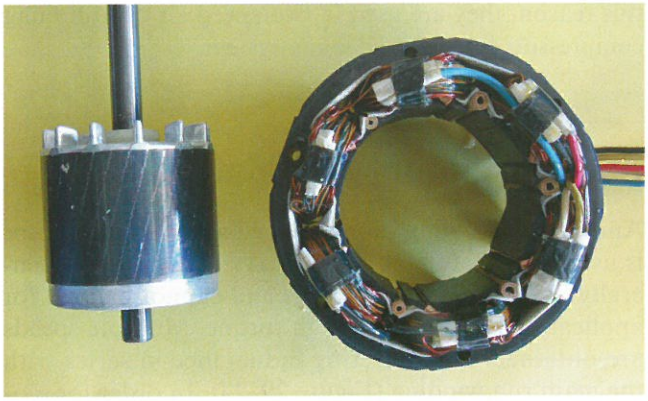

Figure 29–24 Stator winding and rotor of a multispeed shaded pole motor.

Review Questions

1. What are the three major types of split phase motors?
2. What type of split phase motor does not have to disconnect the start winding when the motor reaches approximately 75 percent of its rated speed?
3. What device is generally used to disconnect the start windings of a split phase motor for open type motors that are not hermetically sealed?
4. What is the advantage of a capacitor start induction run motor over a resistance start induction run motor?
5. Maximum starting torque for a split phase motor is developed when the run-winding current and start-winding current are how many degrees out of phase with each other?
6. How is the direction of rotation of a split phase motor changed?
7. What is synchronous speed?
8. What two factors determine synchronous speed?
9. What type of motor changes speed by changing the number of stator poles?
10. What prevents a multispeed fan motor from being damaged when it is operated at a low speed?

Chapter 30

Review Questions

1. Name three methods of braking a motor.
2. How is the braking force of drum type brakes controlled?
3. Why are mechanical brakes often used on cranes?
4. What is the advantage of dynamic brakes over mechanical brakes?
5. What is the disadvantage of dynamic brakes when compared to mechanical brakes?
6. The amount of counter torque developed by a direct current generator is proportional to what?
7. When using dynamic braking for a direct current motor, how is the braking time controlled?
8. Name three factors that determine the amount of induced voltage.
9. How is dynamic braking for direct current motors accomplished?
10. How is the dynamic braking force of an alternating current motor controlled?
11. How is a plugging stop accomplished?
12. What device is generally used to accurately stop a motor when a plugging stop is used?
13. Refer to the circuit shown in Figure 30–10. When the START button is pushed and the motor starts in the forward direction, the plugging switch closes. What prevents the reversing contactor from energizing when the plugging switch contact closes?