TRUE/FALSE

1. A shunt motor is typically used for railway installations, cranes, and other applications requiring high torque at low speed.

   ANS: F PTS: 1 REF: Torque

2. The series motor maintains a constant speed as mechanical load is added.

   ANS: F PTS: 1 REF: Torque

3. A series motor produces a greater torque than a shunt motor for the same increase in current.

   ANS: T PTS: 1 REF: Torque

4. The speed regulation of a line-connected series motor is inherently better than that of a shunt motor.

   ANS: F PTS: 1 REF: Speed Control and Speed Regulation

5. When a mechanical load is added to the series motor, the motor slows with a new, higher torque requirement.

   ANS: T PTS: 1 REF: Speed Control and Speed Regulation

COMPLETION

1. A(n) _____ motor is used as a traction motor because of its capability to produce a high torque with only a moderate increase in power at reduced speed.

   ANS: DC series motor

   PTS: 1 REF: Introduction

2. The direction of _____ may be reversed by changing the direction of the current either in the series field or the armature.

   ANS: rotation

   PTS: 1 REF: Rotation

3. In a series motor, any increase in load causes an increase of _____ in both the field and armature circuits.

   ANS: current

   PTS: 1 REF: Torque

4. A series motor produces a greater _____ than a shunt motor for the same increase in current.

ANS: torque

PTS: 1 REF: Torque

5. The DC series motor has very high starting torque at very low _____.

ANS: speed

PTS: 1 REF: Summary

SHORT ANSWER

1. Draw the basic connection circuit of a series DC motor.

ANS:
Refer to Figure 2-1 in the text.

PTS: 1 REF: Introduction

2. Briefly describe the effects of a reduction of a load on the speed of a DC series motor.

ANS:
If the motor is running with a mechanical load and the load is suddenly reduced, the motor speed increases. The increase in speed creates more CEMF in the armature, and the circuit current is reduced. The circuit current is the same current in both the stator field and the rotor field, therefore squaring the effect of the current reduction. The torque that is produced drops off dramatically.

PTS: 1 REF: Speed Control and Speed Regulation

3. Name three of the four characteristics used in rating series DC motors.

ANS:
Series DC motors are rated for voltage, current, horsepower, and maximum speed.

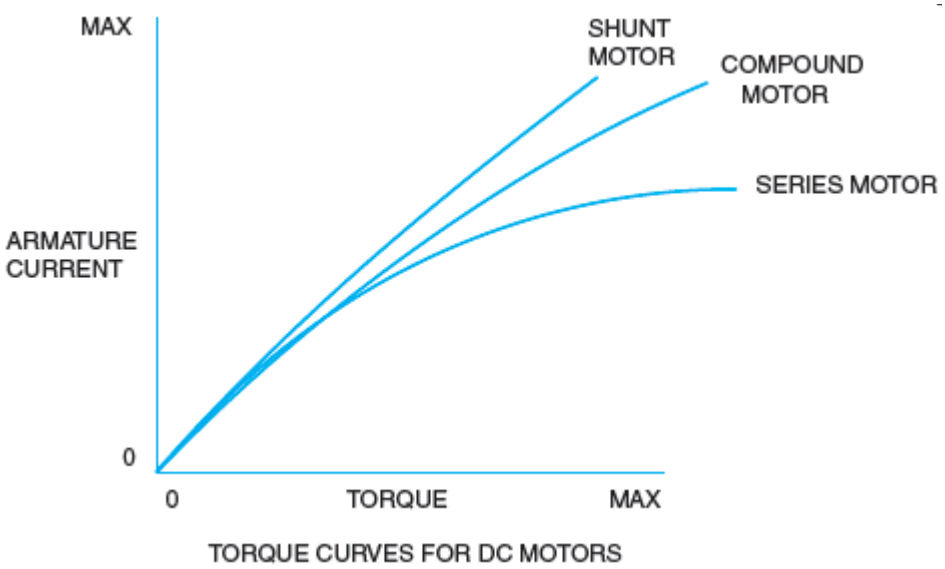
PTS: 1 REF: Motor Ratings

4. Name two examples of applications that utilize DC series motors.

ANS:
The DC series motor is often used for starter motors in automobiles and aircraft.
DC motors are used in forklifts and diesel electric locomotives.

PTS: 1 REF: Introduction | Summary

NARRBEGIN: Figure 02-2



TORQUE CURVES FOR DC MOTORS

NARREND

5. What accounts for the flattened slope of the speed torque curve of the series motor in the accompanying figure?

   ANS:
   When a mechanical load is added to the series motor, the motor slows with a new, higher torque requirement. As the motor slows, the CEMF in the rotor is reduced and the line current is allowed to increase. This affects both the stator field and the rotor field. With a drop in speed, the torque is increased dramatically, and the motor runs at a lower speed but with much larger torque. This gives the speed torque curve its flattened slope.

   PTS: 1 REF: Speed Control and Regulation