

*Electric and Hybrid Electric Vehicles, 1st Edition*

**Quiz 16B**

NAME \_\_\_\_\_

1. The electric vehicle battery heating methods include \_\_\_\_\_. 1. \_\_\_\_\_
  - A) PTC fluid heaters
  - B) PTC air heaters
  - C) heater pads
  - D) Any of the above
  
2. The type of compressor most likely to be used in an EV or HEV is a \_\_\_\_\_ design. 2. \_\_\_\_\_
  - A) piston
  - B) scroll
  - C) variable displacement
  - D) Both a and c
  
3. All of the following statements about hybrid electric vehicle A/C compressors are true, EXCEPT \_\_\_\_\_. 3. \_\_\_\_\_
  - A) most are reciprocating piston designs
  - B) some use a belt drive along with an electric motor
  - C) some use only an electric motor without a belt drive
  - D) nonconductive refrigeration oil must be used with A/C compressors utilizing an electric drive motor.
  
4. The refrigerant in the A/C system absorbs heat in the \_\_\_\_\_. 4. \_\_\_\_\_
  - A) evaporator
  - B) condenser
  - C) compressor
  - D) heater core
  
5. A typical HEV uses waste heat from the \_\_\_\_\_ to heat the cabin. 5. \_\_\_\_\_
  - A) motor/generator
  - B) ICE
  - C) brakes
  - D) exhaust
  
6. Technician A says that HEV compressors may be both electrically and belt driven. Technician B says that scroll type A/C compressors contain rotating scrolls to pressurize the refrigerant. Which technician is correct? 6. \_\_\_\_\_
  - A) Technician A only
  - B) Technician B only
  - C) Both technicians A and B
  - D) Neither technician A nor B
  
7. What is the optimum operating temperature for an internal combustion engine? 7. \_\_\_\_\_
  - A) 200 deg F
  - B) 165 deg F
  - C) 100 deg F
  - D) 235 deg F

8. Technician A says that because of hybrid/ electric technology, the internal combustion engine used on these vehicles runs colder than peak operating temperatures. Technician B says that PTC coolers located in the A/C system are used to overcome this excessive engine heat. Which technician is correct? 8. \_\_\_\_\_
- A) Technician A only
  - B) Technician B only
  - C) Both technicians
  - D) Neither technician
9. Electrically powered A/C compressors should use what type of refrigerant oil? 9. \_\_\_\_\_
- A) PAO
  - B) PAG
  - C) POE
  - D) Polyalkylene glycol
10. An electrically operated A/C compressor has two orange cables. This means the compressor \_\_\_\_\_ 10. \_\_\_\_\_
- A) is powered by the 12-volt auxiliary battery
  - B) has a built-in inverter
  - C) is using an external inverter
  - D) None of the above

## Answer Key

Testname: EV1\_16B

1. D  
Page Ref: 220-221
2. B  
Page Ref: 215
3. A  
Page Ref: 217
4. A  
Page Ref: 213; 219
5. B  
Page Ref: 209
6. A  
Page Ref: 216-217
7. A  
Page Ref: 208
8. D  
Page Ref: 210; 213
9. C  
Page Ref: 217
10. B  
Page Ref: 217