Automotive Technology 7th Edition
Chapter 17: Antifreeze and Coolant
Short Answer Quiz

Name: _____ Date: _____

1. Explain the specific chemical and physical properties that make PHOAT coolant essential for certain engines, particularly in terms of material protection and water quality specifications.

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2. Describe the characteristics of Universal coolant (HOAT) that make it suitable for a wide range of vehicles, and discuss why it cannot be used in engines requiring a silicate-free formulation.

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3. Discuss the significance of the boiling and freezing points of PHOAT coolant, particularly in the context of its 55% concentration and the impact of a 15 PSI pressure cap on these temperatures.

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4. Explain the process and rationale behind using test strips for coolant testing, including the specific parameters they can measure and their accuracy.

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5. Describe the phenomenon of galvanic activity in automotive cooling systems, focusing on the role of different metals and the coolant as an electrolyte, and how this affects corrosion.

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6. Discuss the importance of the refractive index in coolant testing, including its applications in identifying coolant types, determining purity, and measuring solute concentration.

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7. Explain the concept of passivation in the context of coolant chemistry, particularly how it affects the interaction between coolant additives and engine metals, and the implications of changing coolant types.

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8. Describe the role of pH in coolant chemistry, including the typical pH values for new IAT, OAT, HOAT, and PHOAT coolants, and the implications of pH changes over time in used coolant.

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9. Discuss the specific properties and applications of HOAT coolants, including the variations in color and composition among different brands and models, such as VW/Audi pink and Mercedes/Ford yellow.

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10. Explain the use of a refractometer in testing coolant, focusing on how it measures the freezing point and the significance of this measurement in maintaining proper engine temperature.

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