Automotive Brake Systems, 7th Edition
Chapter 4

Name_____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

1) Which type of brake pad material is often referred to as ceramic?

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2) What is kinetic energy?

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3) Why is copper being removed from brake friction material?

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4) What is the difference between semi-metallic and non-asbestos organic (NAO) brake friction materials?

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5) Why is asbestos being restricted in brake friction materials?

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6) Why do brakes fade due to excessive heat or water?

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7) What is meant by the coefficient of friction?

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1) Non-asbestos organic (NAO) brake pads are often called ceramic in the American aftermarket because they include ceramic fibers which are usually potassium titanite.
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2) Kinetic energy is the energy of a mass in motion.
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3) Copper is a pollutant because:
- It is toxic to certain sensitive species of algae (phytoplankton) that form the base of the aquatic food chain.
- Copper also directly damages the sensory capabilities of salmon, making it difficult for them to avoid predators or find their way back to their spawning grounds.

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4) The term semimetallic refers to brake lining material that uses metal rather than asbestos in its formulation. It still uses resins and binders and is, therefore, not 100% metal, but rather semimetallic. Brake pads and linings that use synthetic material such as aramid fibers instead of steel are usually
referred to as:
non-asbestos
non-asbestos organic (NAO)
non-asbestos synthetic (NAS)
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5) Asbestos exposure can cause scar tissue to form in the lungs. This condition is called asbestosis. It gradually causes increasing shortness of breath, and the scarring to the lungs is permanent.
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6) The loss of braking power is called brake fade. Mechanical (heat) fade occurs when a brake drum overheats and expands away from the brake lining. To maintain braking power, the brake shoes must move farther outward, which requires additional brake pedal travel. If a vehicle is driven through deep water or during a severe rainstorm, water can get between the brake drum and the linings. When this occurs, no stopping power is possible until the water is pushed out and normal friction is restored.
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7) The amount of friction between two objects or surfaces is commonly expressed as a value called the coefficient of friction and is represented by the Greek letter mu (μ), pronounced “mYOO.
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