

1. What are the primary factors influencing the friction between two surfaces?

- a) Velocity and temperature
- b) Surface area and material density
- c) Roughness and adhesion
- d) Weight and shape

Answer: c) Roughness and adhesion

Explanation: The roughness of surfaces and the degree of adhesion between them are fundamental factors influencing friction. Rougher surfaces tend to have higher friction, while adhesion between surfaces can increase friction due to molecular interactions.

2. Which of the following describes the primary difference between rolling friction and sliding friction?

- a) Rolling friction occurs between two surfaces in motion, while sliding friction occurs between two stationary surfaces.
- b) Rolling friction involves circular motion, while sliding friction involves linear motion.
- c) Rolling friction is typically higher than sliding friction.
- d) Sliding friction is independent of the surface material, while rolling friction depends on it.

Answer: b) Rolling friction involves circular motion, while sliding friction involves linear motion.

Explanation: Rolling friction involves the resistance encountered when one object rolls over another, typically in a circular motion, while sliding friction occurs when two surfaces slide past each other in a linear motion.

3. Which theory of friction emphasizes the importance of molecular interactions between surfaces?

- a) Laws of Friction
- b) Theory of Adhesion and Abrasion
- c) Molecular Mechanical Theory of Friction
- d) Stick-Slip Characteristics

Answer: c) Molecular Mechanical Theory of Friction

Explanation: The Molecular Mechanical Theory of Friction explains friction as the result of intermolecular forces between atoms and molecules at the contact interface of surfaces.

4. What phenomenon characterizes the “stick-slip” motion observed in certain frictional systems?

- a) Continuous, smooth motion
- b) Sudden jumps or jerks in motion
- c) Gradual decrease in friction over time
- d) Uniform velocity

Answer: b) Sudden jumps or jerks in motion

Explanation: Stick-slip motion refers to the alternating periods of sticking (static friction) and slipping (kinetic friction) observed in some frictional systems, resulting in sudden jumps or jerks in motion.

5. Which parameter significantly influences the coefficient of friction between two surfaces?

- a) Surface color
- b) Ambient humidity
- c) Normal force
- d) Sound frequency

Answer: c) Normal force

Explanation: The normal force, or the force perpendicular to the contact surfaces, significantly influences the coefficient of friction between two surfaces. As the normal force increases, friction generally increases as well.

6. What factor does thermal analysis primarily focus on in relation to friction?

- a) Surface roughness
- b) Temperature rise at the interface
- c) Adhesive strength
- d) Mechanical wear

Answer: b) Temperature rise at the interface

Explanation: Thermal analysis in friction studies primarily focuses on understanding the temperature rise at the interface between two contacting surfaces due to frictional forces.

7. Which mechanism of friction is primarily associated with the loss of material from contacting surfaces?

- a) Adhesion
- b) Abrasion

- c) Stick-slip
- d) Rolling

Answer: b) Abrasion

Explanation: Abrasion refers to the loss of material from the surface of a solid as a result of frictional forces, typically involving the removal of small particles due to sliding contact.

8. In the context of friction, what does the term “interface temperature” refer to?

- a) The temperature of the ambient environment
- b) The temperature inside the materials undergoing friction
- c) The temperature at the contact interface of two surfaces
- d) The temperature of the lubricant used

Answer: c) The temperature at the contact interface of two surfaces

Explanation: Interface temperature in friction refers to the temperature at the contact interface between two surfaces experiencing frictional forces.

9. Which of the following is a characteristic feature of the laws of friction proposed by Leonardo da Vinci?

- a) Friction is independent of surface roughness
- b) Friction is inversely proportional to the velocity
- c) Friction is directly proportional to the surface area
- d) Friction is constant regardless of the materials

Answer: c) Friction is directly proportional to the surface area

Explanation: One of the characteristics of Leonardo da Vinci's laws of friction is that friction is directly proportional to the surface area of the contact between two surfaces.

10. What parameter is commonly calculated to assess the effectiveness of friction devices?

- a) Surface tension
- b) Elastic modulus
- c) Coefficient of friction
- d) Electrical conductivity

Answer: c) Coefficient of friction

Explanation: The coefficient of friction is a parameter commonly calculated to evaluate the effectiveness of friction devices, providing insight into the frictional behavior between two surfaces.

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