1. Which criterion is used to determine frictional torque in pivots and collars when considering uniform pressure and wear rate?

a) Coulomb’s Law
b) Amontons’ Law
c) Archard’s Law
d) Pascal’s Law

Answer: b) Amontons’ Law

Explanation: Amontons’ Law states that the frictional torque in pivots and collars can be determined by considering both uniform pressure and uniform wear rate criteria.

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2. What type of lubrication involves a thin layer of lubricant separating two surfaces in relative motion?

a) Dry lubrication
b) Boundary lubrication
c) Fluid film lubrication
d) Hydrodynamic lubrication

Answer: c) Fluid film lubrication

Explanation: Fluid film lubrication occurs when a thin layer of lubricant is present between two surfaces in relative motion, preventing direct contact and reducing friction.

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3. Friction in journal and thrust bearings is primarily influenced by which lubrication regime?

a) Dry lubrication
b) Boundary lubrication
c) Hydrodynamic lubrication
d) Mixed lubrication

Answer: c) Hydrodynamic lubrication

Explanation: Journal and thrust bearings typically operate under hydrodynamic lubrication, where a fluid film separates the sliding surfaces, reducing friction and wear.

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4. What is the concept of a friction circle in mechanical engineering?

a) A graphical representation of frictional forces acting on a surface
b) A geometric shape representing the area of contact between two mating surfaces
c) A method to calculate the coefficient of friction between two materials
d) A technique to minimize friction losses in mechanical systems

Answer: a) A graphical representation of frictional forces acting on a surface

Explanation: In mechanical engineering, a friction circle is a graphical representation used to

analyze the magnitude and direction of frictional forces acting on a surface.

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5. Rolling friction is primarily associated with which type of motion?

a) Sliding motion
b) Rotational motion
c) Oscillatory motion
d) Vibrational motion

Answer: b) Rotational motion

Explanation: Rolling friction occurs when one object rolls over another, primarily associated with rotational motion, such as the rolling of a wheel on a surface.

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6. Which type of clutch uses a single friction plate to engage and disengage power transmission?

a) Multi-plate clutch
b) Cone clutch
c) Dog clutch
d) Single-plate clutch

Answer: d) Single-plate clutch

Explanation: A single-plate clutch utilizes a single friction plate to engage and disengage power transmission by either pressing against or releasing from another surface.

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7. In multi-plate clutches, multiple friction plates are stacked alternately with what other component?

a) Gears
b) Springs
c) Bearings
d) Washers

Answer: b) Springs

Explanation: In multi-plate clutches, multiple friction plates are stacked alternately with springs to ensure proper engagement and disengagement of power transmission.

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8. Cone clutches are characterized by their conical shape, which allows for what type of engagement mechanism?

a) Linear engagement

b) Radial engagement
c) Axial engagement
d) Tangential engagement

Answer: d) Tangential engagement

Explanation: Cone clutches utilize a conical shape for tangential engagement, where the friction surfaces make contact along the taper of the cone to transmit torque.

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9. Which criterion determines the capacity of a clutch to transmit torque without slipping?

a) Amontons' Law
b) Coulomb's Law
c) Archard's Law
d) Pascal's Law

Answer: b) Coulomb's Law

Explanation: Coulomb's Law is used to determine the capacity of a clutch to transmit torque without slipping, taking into account the frictional properties of the materials involved.

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10. What is the primary advantage of using cone clutches compared to other types of

clutches?

a) Higher torque capacity
b) Faster engagement
c) Reduced wear
d) Smaller size

Answer: c) Reduced wear

Explanation: Cone clutches offer the advantage of reduced wear due to their conical shape, which distributes frictional forces evenly across the engaging surfaces, prolonging clutch life.

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