Forces and the Laws of Motion

Section Quiz: Everyday Forces

Write the letter of the correct answer in the space provided.

_____ 1. The acceleration due to gravity
a. is caused by a field force.
b. has a magnitude of 9.81 m/s^2 at Earth's surface.
c. is represented by the symbol, a_g.
d. all of the above

_____ 2. The normal force
a. equals F_g in magnitude.
b. points vertically upward.
c. is a scalar quantity.
d. acts perpendicular to a surface.

_____ 3. For an object in contact with a given surface, the kinetic friction acting on the object
a. usually is more than static friction.
b. is independent of the normal force.
c. depends on the composition and qualities of the surfaces in contact.
d. acts perpendicular to the surface.

_____ 4. The coefficient of kinetic friction
a. is a type of contact force.
b. is measured in newtons.
c. depends on the normal force.
d. depends on the composition and qualities of the surfaces in contact.

_____ 5. A lubricant decreases kinetic friction between surfaces. The most likely reason it reduces kinetic friction is because the lubricant
a. reduces the normal force.
b. changes the composition and qualities of the surfaces in contact.
c. increases static friction.
d. produces greater adhesion between the two surfaces.

_____ 6. A plank is inclined at angle θ, north of west. The direction of the normal force exerted by that plank on an object would be oriented at angle θ,
a. north of west.
b. east of north.
c. south of east.
d. west of south.

Name:_____ Class:_____ Date:_____

_____ 7. Which of the following statements are true about $F_{s,\,max}$ in the equation $\mu_s = \frac{F_{s,max}}{F_n}$?

I. $F_{s,\,max}$ is exerted perpendicular to the surfaces in contact.
II. $F_{s,\,max}$ represents the maximum value of the force of static friction.
III. On a level surface, the magnitude of $F_{s,\,max}$ equals the magnitude of the applied force that starts the object moving.

a. I only
b. II only
c. I, II, and III
d. II and III

_____ 8. All of the following statements about kinetic friction are true *except*

a. Kinetic friction is calculated by the equation $F_f = \mu_\kappa F_n$.
b. Kinetic friction is exerted parallel to the surface.
c. Kinetic friction is exerted opposite the direction of motion.
d. For an object on an incline, kinetic friction increases as the angle of the incline above the horizontal increases.

9. Explain the relationship between mass and weight.

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10. A 95 kg clock initially at rest on a horizontal floor requires a 650 N horizontal force to set it in motion. After the clock is in motion, a horizontal force of 550 N keeps it moving with a constant velocity. Find μ_s and μ_k between the clock and floor.