

For each question, select the best answer from the four alternatives.

1. Regularly timed pictures of a ball falling at terminal speed will have what type of spacing? (4.1) **K/U**
 - (a) erratic
 - (b) even
 - (c) uneven
 - (d) increasing
2. Compared to slow-moving objects, fast-moving objects experience
 - (a) no air resistance
 - (b) less air resistance
 - (c) equal air resistance
 - (d) more air resistance (4.1) **K/U**
3. The magnitude of gravitational field strength is equal to the magnitude of the
 - (a) speed of free fall
 - (b) gravitational acceleration
 - (c) static friction coefficient
 - (d) gravitational force (4.1) **K/U**
4. Kinetic friction force depends on the normal force acting on an object and which of the following? (4.2) **K/U**
 - (a) coefficient of static friction
 - (b) speed of motion
 - (c) direction of motion
 - (d) coefficient of kinetic friction
5. Which of these is an example of static friction making an object move? (4.3) **K/U**
 - (a) a runner pushing off starting blocks
 - (b) a car coming to a controlled stop
 - (c) a plate being pushed across a table
 - (d) a sliding box decreasing in speed
6. Which of these are the two friction surfaces in an automobile disc brake? (4.4) **K/U**
 - (a) piston and rotor
 - (b) pads and piston
 - (c) piston and wheel hub
 - (d) pads and rotor
7. Running shoes are designed to do what to the force of friction between the runner and the ground? (4.5) **K/U**
 - (a) increase
 - (b) decrease
 - (c) slow down
 - (d) all of the above
8. Near-frictionless carbon is a proposed solution for problems of both friction and
 - (a) space
 - (b) weight
 - (c) wear
 - (d) speed (4.5) **K/U**

Indicate whether each statement is true or false. If you think the statement is false, rewrite it to make it true.

9. Free fall is when both gravity and air resistance are acting on a falling object. (4.1) **K/U**
10. The force of air resistance on an object depends on several factors, including the object's cross-sectional area. (4.1) **K/U**
11. When an object is sliding, it experiences a greater magnitude of friction force than when it is stationary. (4.2) **K/U**
12. Kinetic friction is the force exerted on an object by a surface that prevents a stationary object from moving. (4.2) **K/U**
13. Sometimes friction is desirable. (4.3) **K/U**
14. If the force produced by a train engine is not large enough to overcome the combined static friction of the cars, it will move some of the cars. (4.3) **K/U**
15. Usually friction does not depend on the contact area, but rubber is an exception. (4.4) **K/U**
16. Electronic stability control uses traction control, but not an antilock braking system. (4.4) **K/U**
17. When airbags are deployed, the driver of the vehicle cannot become injured. (4.4) **K/U**
18. Magnetic bearing systems do not require backup bearings because they do not fail. (4.5) **K/U**
19. Some claim that new materials and designs used in prosthetics actually give athletes with artificial limbs an advantage over other athletes. (4.5) **K/U**
20. Near-frictionless carbon has a coefficient of friction greater than that of Teflon. (4.5) **K/U**

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