

Name _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 1) Whereas Aristotle relied on logic in explaining nature, Galileo relied on _____
A) logic also. B) experiment. C) patterns. D) mathematics.
- 2) The scientist to first introduce the concept of inertia was _____
A) Copernicus. B) Newton. C) Aristotle. D) Galileo.
- 3) Galileo's interpretation of motion differed from Aristotle's in that Galileo emphasized _____
A) time rates.
B) the role of distance in describing motion.
C) the acceleration of free-fall.
D) all of these
E) none of these
- 4) Which has the greater mass? _____
A) automobile battery B) king-size pillow C) both about the same
- 5) A kilogram is a measure of an object's _____
A) gravity.
B) weight.
C) mass.
D) center of mass.
E) force.
- 6) Compared with a 1-kg block of solid iron, a 2-kg block of solid iron has twice as much _____
A) inertia.
B) volume.
C) mass.
D) all of these
E) none of these
- 7) Compared with a 1-kg block of solid iron, a 2-kg block of solid iron has the same _____
A) mass.
B) weight.
C) volume.
D) all of these
E) none of these
- 8) Your weight is _____
A) a property of mechanical equilibrium.
B) the gravitational attraction between you and the Earth.
C) actually your mass.
D) the same in all locations.

- 18) If a nonrotating object has no acceleration, then we can say for certain that it is 18) _____
- A) at rest.
 - B) in mechanical equilibrium.
 - C) moving at constant nonzero velocity.
 - D) all of the above
 - E) none of the above

ESSAY. Write your answer in the space provided or on a separate sheet of paper.

- 19) If you stand on a pair of bathroom scales, explain how the readings change as you shift your weight gradually from side to side. What rule governs the readings on the scales?

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 20) When you stand at rest on a pair of bathroom scales, the readings on the scales will always 20) _____
- A) each equal your weight.
 - B) each be half your weight.
 - C) add to equal your weight.
- 21) Hang from a pair of gym rings and the upward support forces of the rings will always 21) _____
- A) each be equal to your weight.
 - B) each be half your weight.
 - C) add up to equal your weight.
- 22) A man weighing 800 N stands at rest on two bathroom scales so that his weight is distributed 22) _____ evenly over both scales. The reading on each scale is
- A) 1600 N.
 - B) 200 N.
 - C) 400 N.
 - D) 800 N.
 - E) none of the above
- 23) The force of friction on a sliding object is 10 N. The applied force needed to maintain a constant 23) _____ velocity is
- A) more than 10 N.
 - B) 10 N.
 - C) less than 10 N.
- 24) A 300-kg bear grasping a vertical tree slides down at constant velocity. The friction force between 24) _____ the tree and the bear is
- A) 3000 N.
 - B) more than 3000 N.
 - C) 300 N.
 - D) 30 N.
- 25) The resistive force of friction occurs for 25) _____
- A) liquids.
 - B) gases.
 - C) solids.
 - D) all of these.
- 26) The amount of friction that occurs when two material surfaces slide against each other depends on 26) _____
- A) how much they are pressed together.
 - B) the "stickiness" of atoms on their surfaces.
 - C) both of these
 - D) none of these

- 27) If you push a crate across a level floor at constant speed, the friction between the crate and the floor is 27) _____
A) a bit more than your pushing force. B) a bit less than your pushing force.
C) the same amount as your pushing force. D) none of these
- 28) The two measurements necessary for calculating average speed are 28) _____
A) velocity and distance.
B) velocity and time.
C) distance and acceleration.
D) acceleration and time.
E) distance and time.
- 29) The average speed of a horse that gallops a distance of 10 km in a time of 30 min is 29) _____
A) 30 km/h. B) 10 km/h.
C) 20 km/h. D) more than 30 km/h.
- 30) What is the acceleration of a car that maintains a constant velocity of 100 km/h for 10 s? 30) _____
A) 0 m/s^2 B) 10 km/h/s C) 10 m/s^2 D) 1000 km/h/s
- 31) As an object freely falls, its 31) _____
A) acceleration increases. B) velocity increases.
C) both of the above D) none of the above
- 32) The gain in speed each second for a freely falling object is about 32) _____
A) 5 m/s.
B) 20 m/s.
C) 0.
D) 10 m/s.
E) depends on the initial speed
- 33) If a freely falling object were somehow equipped with a speedometer, its speed reading would increase each second by about 33) _____
A) 10 m/s.
B) 15 m/s.
C) 5 m/s.
D) a variable amount
E) depends on its initial speed

ESSAY. Write your answer in the space provided or on a separate sheet of paper.

- 34) Many people are confused about velocity and acceleration, thinking the terms mean the same thing. Distinguish between these two and give an example.

Answer Key

Testname: UNTITLED1

- 1) B
Topic: Aristotle on Motion
- 2) D
Topic: Galileo's Concept of Inertia
- 3) A
Topic: Galileo's Concept of Inertia
- 4) A
Topic: Mass —A Measure of Inertia
- 5) C
Topic: Mass —A Measure of Inertia
- 6) D
Topic: Mass —A Measure of Inertia
- 7) E
Topic: Mass —A Measure of Inertia
- 8) B
Topic: Mass —A Measure of Inertia
- 9) D
Topic: Mass —A Measure of Inertia
- 10) B
Topic: Mass —A Measure of Inertia
- 11) A
Topic: Mass —A Measure of Inertia
- 12) B
Topic: Mass —A Measure of Inertia
- 13) B
Topic: Mass —A Measure of Inertia
- 14) A
Topic: Net Force
- 15) D
Topic: Net Force
- 16) B
Topic: Net Force
- 17) D
Topic: The Equilibrium Rule
- 18) B
Topic: The Equilibrium Rule
- 19) The equilibrium rule guides the scale readings. That is, the total of the readings adds to equal your weight. Then the net force on you is zero at all times. The scales push up as much as gravity pulls you down. For example, stand evenly and the readings are the same. Shift more weight on your left foot and the reading on the left scale increases. Its gain is equal to the loss of reading on the scale supporting your right foot.
Topic: The Equilibrium Rule
- 20) C
Topic: Support Force
- 21) C
Topic: Support Force
- 22) C
Topic: Support Force

Answer Key

Testname: UNTITLED1

23) B

Topic: Dynamic Equilibrium

24) A

Topic: Dynamic Equilibrium

25) D

Topic: The Force of Friction

26) C

Topic: The Force of Friction

27) C

Topic: The Force of Friction

28) E

Topic: Speed and Velocity

29) C

Topic: Speed and Velocity

30) A

Topic: Acceleration

31) B

Topic: Acceleration

32) D

Topic: Acceleration

33) A

Topic: Acceleration

34) Velocity tells how fast you are going, like speed, but with direction stated or implied. Acceleration tells you how quickly velocity changes. For example, a hockey puck at rest has both zero velocity and zero acceleration. No change occurs in either. But the same puck sliding across the ice at constant velocity has zero acceleration. Again, no change occurs for either.

Topic: Velocity and Acceleration