## Chapter 5 Review

**Multiple Choice**
*Identify the choice that best completes the statement or answers the question.*

____ 1. A measurement standard is defined as ____.
a. a system of prefixes
b. the distance between two points
c. the exact quantity people agree to use for comparison
d. the interval between two events

____ 2. The prefix *kilo-* means ____.
a. 1,000
b. 100
c. 0.01
d. 0.001

____ 3. The prefix *milli-* means ____.
a. 1,000
b. 100
c. 0.01
d. 0.001

____ 4. The correct symbol for the SI unit of temperature is ____.
a. ºC
b. ºF
c. K
d. s

____ 5. The SI unit that is used to measure time is the ____.
a. kelvin
b. kilogram
c. second
d. meter

____ 6. The variable plotted on the horizontal or *x*-axis is called the ____.
a. dependent variable
b. independent variable
c. variable with the largest range
d. variable with the smallest range

____ 7. How many meters are there in 1,865 cm?
a. 0.1865
b. 1.865
c. 18.65
d. 186.5

____ 8. In a graph showing temperature change of a material over time, temperature change is the ____.
a. dependent variable
b. independent variable
c. variable with the largest range
d. variable with the smallest range

____ 9. The best type of graph to use to show how some fixed quantity is broken down into parts is ____.
a. bar graph
b. line graph
c. circle graph
d. scatter graph

____ 10. One benefit of the SI system is that it is ____.
a. based on units of 100
b. not used to measure temperature
c. based on multiples of ten
d. not used in the United States

____ 11. A beaker contains 0.32 L of water. What is the volume of this water in milliliters?
a. 320 mL
b. 3.2 mL
c. 32 mL
d. 0.32 mL

____ 12. A box is 25 cm long, 6 cm wide, and 4 cm high. How many cubic centimeters of water can it hold?
a. 600
b. 25
c. 150
d. 24

____ 13. The lightbulb is an example of ____.
a. a dependent variable
b. an exercise
c. pure science
d. technology

____ 14. Another term for technology is ____.
a. applied science
c. matter

b. energy
d. pure science

____ 15. The process of gathering information through the senses is called ____.
a. analysis
c. hypothesis
b. observation
d. inference

____ 16. When designing an experiment, the first step is to ____.
a. analyze the data
c. state a hypothesis
b. list a procedure
d. state the problem

____ 17. A rule or principle that describes what happens in nature is a ____.
a. hypothesis
c. scientific law
b. problem
d. theory

____ 18. An explanation of an event that is based on repeated observations and experiments is a ____.
a. hypothesis
c. problem
b. scientific law
d. theory

____ 19. An idea, event, or object can be represented by a ____ to help people better understand it.
a. constant
c. law
b. hypothesis
d. model

____ 20. In an experiment to determine whether the popping of popcorn is affected by the temperature at which it is stored, counting the popped kernels is an example of a(n) ____.
a. conclusion
c. hypothesis
b. control
d. observation

____ 21. A standard for comparison that helps to ensure that the experimental result is caused by the condition being tested is the ____.
a. constant
c. dependent variable
b. control
d. hypothesis

____ 22. A factor in an experiment that changes from the manipulation of the independent variable is the ____.
a. constant
c. dependent variable
b. control
d. hypothesis

____ 23. A factor that does NOT change in an experiment is the ____.
a. constant
c. dependent variable
b. control
d. hypothesis

____ 24. Studying the effect of one thing on another in order to test a hypothesis is a(n) ____.
a. exercise
c. constant
b. experiment
d. problem

____ 25. A factor that is manipulated in an experiment to change the dependent variable is the ____.
a. constant
c. control
b. dependent variable
d. independent variable

____ 26. The application of scientific knowledge to help people is ____.
a. a discovery
c. pure science
b. a hypothesis
d. technology

____ 27. If you ride your bicycle down a straight road for 500 m then turn around and ride back, your distance is ____ your displacement.
a. greater than
c. less than
b. equal to
d. can’t determine

____ 28. Motion is a change in ____.
a. time
c. velocity
b. speed
d. position

____ 29. The speed you read on a speedometer is ____.
a. instantaneous speed
c. average speed

b. constant speed
d. velocity

____ 30. 3 m/s north is an example of a(n) ____.
a. speed
b. velocity
c. position
d. acceleration

____ 31. The relationship among speed, distance, and time is ____.
a. $t = s/d$
b. $d = t/s$
c. $s = dt$
d. $s = d/t$

____ 32. A single point on a distance-time graph tells the ____.
a. instantaneous speed
b. average speed
c. constant speed
d. average velocity

____ 33. A merry-go-round horse moves at a constant speed but at a changing ____.
a. velocity
b. balanced force
c. inertia
d. unbalanced force

____ 34. Acceleration is rate of change of ____.
a. position
b. time
c. velocity
d. force

____ 35. If you ride your bike up a hill, then ride down the other side, your acceleration is ____.
a. all positive
b. all negative
c. first positive, then negative
d. first negative, then positive

____ 36. The equation used to find acceleration is a = ____.
a. $v_f - v_i/t$
b. $v/t$
c. $v_i - v_f/t$
d. $v_i + v_f/t$

____ 37. A horizontal line on a velocity/time graph shows ____ acceleration.
a. positive
b. negative
c. changing
d. zero

____ 38. Inertia varies depending on ____.
a. force
b. mass
c. velocity
d. motion

____ 39. Newton's first law of motion is also called the law of ____.
a. mass
b. inertia
c. force
d. constant velocity

____ 40. The upward force on an object falling through the air is ____.
a. air resistance
b. inertia
c. momentum
d. terminal velocity

____ 41. The relationship among mass, force, and acceleration is explained by ____.
a. conservation of momentum
b. Newton's first law of motion
c. Newton's second law of motion
d. Newton's third law of motion

____ 42. A feather will fall through the air more slowly than a brick because of ____.
a. air resistance
b. gravity
c. inertia
d. momentum

____ 43. In the absence of air, a penny and a feather that are dropped from the same height at the same time will ____.
a. fall at different rates
b. fall at the same rate
c. float
d. not have momentum

____ 44. The acceleration due to gravity is ____.
a. 98 $m/s^2$
b. 9.8 $m/s^2$
c. 9.8 m/s
d. 0.98 m/s

____ 45. According to Newton's second law of motion, ____.
a. $F = m \times a$
c. $F = p \times a$

b. $F = m \times v$ d. $F = p \times v$

____ 46. When an object moves in a circular path, it accelerates toward the center of the circle as a result of ____.
a. centripetal force c. gravitational force
b. frictional force d. momentum

____ 47. The path of a projectile is ____.
a. curved c. always vertical
b. always horizontal d. straight

____ 48. For any object, the greater the force that's applied to it, the greater its ____ will be.
a. acceleration c. inertia
b. gravity d. velocity

____ 49. The size of the gravitational force between two objects depends on their ____.
a. frictional forces
b. inertia
c. masses and the distance between them
d. speed and direction

____ 50. As you get farther from the center of Earth, your weight will ____.
a. decrease c. remain the same
b. increase d. can't tell from information given

____ 51. When a force is exerted on a box, an equal and opposite force is exerted by the box. These forces are called ____ forces.
a. action-reaction c. frictional
b. centripetal d. gravitational

____ 52. A real car moving at 10 km/h has more momentum than a toy car moving at the same speed because the real car ____.
a. generates less friction c. has less mass
b. has greater mass d. has greater forward motion

____ 53. In the equation $p = m \times v$, the $p$ represents ____.
a. friction c. momentum
b. inertia d. position

____ 54. The statement "to every action there is an equal and opposite reaction" is ____.
a. the law of conservation of momentum
b. Newton's first law of motion
c. Newton's second law of motion
d. Newton's third law of motion

____ 55. The unit of momentum is ____.
a. kg × m c. kg × $m/s^2$
b. kg × m/s d. $m/s^2$

____ 56. When two balls collide, the momentum of the balls after the collision is explained by ____.
a. the law of conservation of momentum
b. Newton's first law of motion
c. Newton's second law of motion
d. Newton's third law of motion

____ 57. A 300-N force acts on a 25-kg object. The acceleration of the object is ____.
a. 7,500 $m/s^2$ c. 25 $m/s^2$
b. 300 $m/s^2$ d. 12 $m/s^2$

____ 58. A 3,000-N force acts on a 200-kg object. The acceleration of the object is ____.
a. 50 $m/s^2$ c. 15 $m/s^2$
b. 26 $m/s^2$ d. 150 $m/s^2$

____ 59. An object that is in free fall seems to be ____.
a. not moving
b. slowed by air resistance
c. speeded up by air resistance
d. weightless

____ 60. If gravity did NOT affect the path of a horizontally thrown ball, the ball would ____.
a. go straight up
b. fall straight down
c. follow a curved path
d. travel horizontally

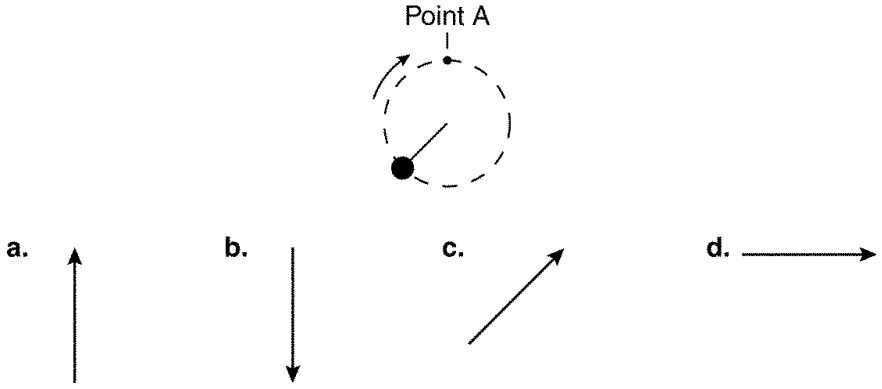


**Figure 3-1**

____ 61. A ball attached to a string is being swung in a clockwise circular path as shown in Figure 3-1. Assume the string breaks at point A. In which direction will the ball be traveling an instant later?
a. direction a
b. direction b
c. direction c
d. direction d

____ 62. A ball attached to a string is being swung in a clockwise circular path as shown in Figure 3-1. In which direction will the acceleration on the ball be when the ball passes point A?
a. direction a
b. direction b
c. direction c
d. direction d

____ 63. The kinetic energy of an object increases as its ____ increases.
a. gravitational energy
b. potential energy
c. specific heat
d. velocity

____ 64. Increasing the speed of an object ____ its potential energy.
a. does not affect
b. increases
c. decreases
d. changes

____ 65. The SI unit for energy is the ____.
a. calorie
b. joule
c. meter per second
d. kilogram

____ 66. You can calculate kinetic energy by using the equation ____.
a. KE (J) = $m$ (kg) × 9.8 $m/s^2$ × $h$ (m)
b. KE (J) = $w$ (m) × $h$ (m)
c. KE (J) = 1/2 $m$ (kg) × $v^2$ ($m^2/s^2$)
d. KE (J) = 9.8 $m/s^2$ × 1/2 $m$ (kg)

____ 67. You can calculate gravitational potential energy by using the equation ____.
a. GPE (J) = 1/2$m$ (kg) × 1/2$h$ (m)
b. GPE (J) = $m$ (kg) × 9.8 $m/s^2$ × $h$ (m)
c. GPE (J) = $h$ (m) × 9.8 $m/s^2$
d. GPE (J) = 1/2$h$ (m) × $w$ (m)

____ 68. Which of the following devices does not make use of electrical energy?
a. upright piano
b. radio
c. toaster
d. digital camera

____ 69. A bus engine transfers chemical potential energy into ____ so that the bus moves.
a. thermal energy
c. electrical energy

b. gravitational potential energy
d. kinetic energy

____ 70. In a nuclear fusion reaction, mass is transformed into ____.
a. matter
b. nuclei
c. energy
d. light

____ 71. According to the law of conservation of energy, the total amount of energy in the universe ____.
a. remains constant
b. changes constantly
c. increases
d. decreases

____ 72. If a weight lifter is holding barbells above his head, what does he have to do to perform work?
a. stand still
b. move barbells sideways
c. step forward
d. lower barbells

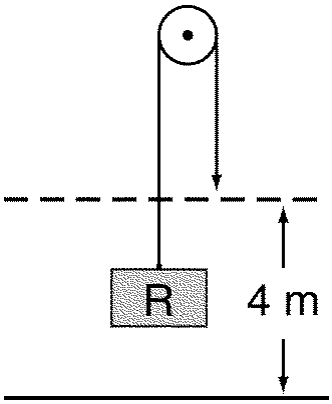


**Figure 5-1**

____ 73. The fixed pulley shown in Figure 5-1 does which one of the following?
a. doubles the force required to lift the block
b. decrease the force required to lift the block
c. makes the block easier to lift by changing the direction of the force needed to lift it
d. decreases the force required and changes the direction of the force required

____ 74. A slanted surface used to raise an object is a(n) ____.
a. efficiency board
b. effort ramp
c. inclined plane
d. screw

____ 75. A device that does work with only one movement and changes the size or direction of a force is a(n) ____.
a. compound machine
b. effort machine
c. screw
d. simple machine

____ 76. A bar that is free to pivot about a fixed point is a ____.
a. fulcrum
b. lever
c. ramp
d. screw

____ 77. The rate at which work is done is called ____.
a. efficiency
b. effort time
c. force
d. power

____ 78. The amount by which a machine multiplies an effort force is called the ____.
a. efficiency factor
b. fulcrum
c. mechanical advantage
d. resistance force

____ 79. An inclined plane with one or two sloping sides forms a machine called a ____.
a. pulley
b. lever
c. ramp
d. wedge

____ 80. An inclined plane wrapped around a cylindrical post is a ____.

a. block and tackle
b. lever
c. ramp
d. screw

____ 81. A machine that changes only the direction of a force has a mechanical advantage of ____.
a. 100
b. 10
c. 5
d. 1

____ 82. A winding mountain road is an example of a(n) ____.
a. block and tackle
b. lever
c. inclined plane
d. wheel and axle

____ 83. When two or more simple machines work together, they are called a(n)____.
a. compound machine
b. effort machine
c. screw
d. simple machine

____ 84. The unit of power is the ____.
a. joule
b. watt
c. m/s
d. second

____ 85. A lever with a mechanical advantage greater than 1 is used to ____.
a. change direction
b. increase distance
c. increase force
d. increase force and change direction

____ 86. Three of the following simple machines are basically the same. The one that does NOT belong with the group is the ____.
a. lever
b. pulley
c. wedge
d. wheel and axle

____ 87. An arrangement of pulleys designed to reduce the effort force is called a ____.
a. block and tackle
b. fixed pulley
c. movable pulley
d. simple pulley

____ 88. Two simple machines that are part of a bicycle are a(n)____.
a. gear and a wheel and axle
b. inclined plane and a lever
c. inclined plane and a wedge
d. screw and an inclined plane

**True/False**
*Indicate whether the statement is true or false.*

____ 89. Balanced forces acting on an object cause the object to accelerate.

____ 90. Gravity causes all falling objects to accelerate at a rate of 98 $m/s^2$.

____ 91. Acceleration is defined as the rate of change of position.

____ 92. The momentum of a 5,000-kg truck that is standing still is greater than the momentum of a 3,000-kg truck that is also at rest.

____ 93. The projectile velocity is the highest velocity that will be reached by a falling object.

____ 94. When an object falls, it is reacting to the force of gravity.

____ 95. Jane is on a merry-go-round that is moving at a constant speed. Her velocity is also constant.

____ 96. Momentum is a property of an object and cannot be transferred from that object to another object.

____ 97. Objects in Earth's orbit appear to be weightless because they are in free fall.

____ 98. Friction is a force that encourages motion between two surfaces that are touching each other.

____ 99. Energy doesn't have to involve motion.

____ 100. Energy is the ability to cause change.

____ 101. Energy is measured in joules.

____ 102. When you ride a playground swing, your potential energy is greatest at the highest point.

____ 103. Chemical energy travels from the Sun to Earth and is transformed into light energy by plants.

____ 104. As mass decreases, kinetic energy increases.

____ 105. Lowering an object decreases its potential energy.

____ 106. In a car engine, burning fuel produces heat, which causes gases to expand, producing kinetic energy.

____ 107. The sum of potential and kinetic energy in a system is called the total energy.

____ 108. As an object falls its potential energy is lost to the air around it.

____ 109. Carbohydrates and fats provide our bodies with energy in the form of calories.

____ 110. Energy from the Sun and energy from food are just different forms of the same thing.

____ 111. When a machine is used to do work, the force applied by the machine is called the effort force.

____ 112. Under certain conditions, it is possible to get more work out of a machine than you put into it.

____ 113. Some machines don't multiply the force that is applied to them.

____ 114. Examples of all three classes of levers are found in the human body.

____ 115. In order for work to be done on a object, the object must move.

**Modified True/False**

*Indicate whether the statement is true or false. If false, change the identified word or phrase to make the statement true.*

____ 116. Displacement includes both distance and direction. _____

____ 117. Motion occurs when there is a change in speed. _____

____ 118. If you were trying to get out of the way of a storm, you would need to know the speed at which it was moving. _____

____ 119. The total distance traveled divided by the constant speed is the average speed. _____

____ 120. The relationship s = d/t can be used to calculate speed, distance or time. _____

____ 121. Acceleration occurs when velocity changes. _____

____ 122. If you roll a ball up a hill, it undergoes positive acceleration. _____

____ 123. When you push on a sled and it begins to go downhill, you cause negative acceleration. _____

____ 124. Acceleration is calculated by dividing change in speed by total time. _____

____ 125. When the forces acting on an object are unbalanced, the net force is zero. _____

____ 126. An object in motion at a constant velocity will change its motion only if a balanced force acts on it. _____

____ 127. In a car crash, inertia could cause you to crash into the windshield. _____

____ 128. The greater an object's mass, the weaker the gravitational force on it. _____

____ 129. When a ball is dropped, it falls down due to the force of friction. _____

____ 130. Pushing a box up a hill, you have to overcome static friction. _____

____ 131. A box doesn't move when you push it because of static friction. _____

____ 132. Energy in the form of motion is potential energy. _____

____ 133. According to the law of conservation of energy, mechanical energy can be changed to heat energy. _____

____ 134. A rock at the edge of a cliff has kinetic energy because of its position. _____

____ 135. When you put on the brakes of a bicycle, friction causes some of the mechanical energy to change to thermal energy. _____

____ 136. According to the law of conservation of energy, energy can be created or destroyed. _____

____ 137. Energy that is stored is kinetic energy. _____

____ 138. Energy stored in food you eat is chemical potential energy. _____

____ 139. Elastic energy is the total potential and kinetic energy in a system. _____

____ 140. Energy is measured in joules. _____

____ 141. Compression energy is stored in a stretched rubber band. _____

____ 142. A book sitting on a shelf has gravitational potential energy. _____

____ 143. Actual mechanical advantage is determined with the equation $MA = F_r/F_e$. _____

____ 144. Power is work done over a distance. _____

____ 145. The longer arm of a lever with a mechanical advantage greater than 1 is the effort arm. _____

____ 146. Friction changes the useful work of a machine into mechanical energy. _____

____ 147. Reducing friction increases the ideal mechanical advantage of a machine. _____

## Chapter 5 Review
## Answer Section

### MULTIPLE CHOICE

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. | ANS: C | PTS: 1 | DIF: B | OBJ: 4/2 | | | |
| 2. | ANS: A | PTS: 1 | DIF: B | OBJ: 4/2 | | | |
| 3. | ANS: D | PTS: 1 | DIF: B | OBJ: 4/2 | | | |
| 4. | ANS: C | PTS: 1 | DIF: B | OBJ: 5/2 | | | |
| 5. | ANS: C | PTS: 1 | DIF: B | OBJ: 5/2 | | | |
| 6. | ANS: B | PTS: 1 | DIF: B | OBJ: 8/3 | | | |
| 7. | ANS: C | PTS: 1 | DIF: B | OBJ: 6/2 | | | |
| 8. | ANS: A | PTS: 1 | DIF: B | OBJ: 8/3 | | | |
| 9. | ANS: C | PTS: 1 | DIF: B | OBJ: 7/3 | | | |
| 10. | ANS: C | PTS: 1 | DIF: B | OBJ: 4/2 | | | |
| 11. | ANS: A | PTS: 1 | DIF: B | OBJ: 6/2 | | | |
| 12. | ANS: A | PTS: 1 | DIF: B | OBJ: 6/2 | | | |
| 13. | ANS: D | PTS: 1 | DIF: B | OBJ: 3/1 | | | |
| 14. | ANS: A | PTS: 1 | DIF: B | OBJ: 3/1 | | | |
| 15. | ANS: B | PTS: 1 | DIF: B | OBJ: 1/1 | | | |
| 16. | ANS: D | PTS: 1 | DIF: B | OBJ: 1/1 | | | |
| 17. | ANS: C | PTS: 1 | DIF: B | OBJ: 1/1 | | | |
| 18. | ANS: D | PTS: 1 | DIF: B | OBJ: 1/1 | | | |
| 19. | ANS: D | PTS: 1 | DIF: B | OBJ: 1/1 | | | |
| 20. | ANS: D | PTS: 1 | DIF: B | OBJ: 1/1 | | | |
| 21. | ANS: B | PTS: 1 | DIF: B | OBJ: 1/1 | | | |
| 22. | ANS: C | PTS: 1 | DIF: B | OBJ: 1/1 | | | |
| 23. | ANS: A | PTS: 1 | DIF: B | OBJ: 1/1 | | | |
| 24. | ANS: B | PTS: 1 | DIF: B | OBJ: 1/1 | | | |
| 25. | ANS: D | PTS: 1 | DIF: B | OBJ: 1/1 | | | |
| 26. | ANS: D | PTS: 1 | DIF: B | OBJ: 3/1 | | | |
| 27. | ANS: A | PTS: 1 | DIF: B | OBJ: 1/1 | | | |
| | STA: S4.PS.KI.5.1a | | | | | | |
| 28. | ANS: D | PTS: 1 | DIF: B | OBJ: 1/1 | | | |
| | STA: S4.PS.KI.5.1b | | | | | | |
| 29. | ANS: A | PTS: 1 | DIF: B | OBJ: 2/1 | | | |
| 30. | ANS: B | PTS: 1 | DIF: B | OBJ: 2/1 | | | |
| | STA: S4.PS.KI.5.1b | | | | | | |
| 31. | ANS: D | PTS: 1 | DIF: B | OBJ: 2/1 | | | |
| | STA: S4.PS.KI.5.1b | | | | | | |
| 32. | ANS: A | PTS: 1 | DIF: B | OBJ: 3/1 | | | |
| 33. | ANS: A | PTS: 1 | DIF: B | OBJ: 2/1 | | | |
| | STA: S4.PS.KI.5.1b | | | | | | |
| 34. | ANS: C | PTS: 1 | DIF: B | OBJ: 4/2 | | | |
| | STA: S4.PS.KI.5.1b | | | | | | |
| 35. | ANS: D | PTS: 1 | DIF: B | OBJ: 5/2 | | | |

STA: S4.PS.KI.5.1b

36. ANS: A PTS: 1 DIF: B OBJ: 6/2

37. ANS: D PTS: 1 DIF: B OBJ: 6/2
STA: S1.PS.KI.3.1a

38. ANS: B PTS: 1 DIF: B OBJ: 8/3
STA: S4.PS.KI.5.1d

39. ANS: B PTS: 1 DIF: B OBJ: 8/3

40. ANS: A PTS: 1 DIF: B OBJ: 3/1

41. ANS: C PTS: 1 DIF: B OBJ: 1/1

42. ANS: A PTS: 1 DIF: B OBJ: 3/1
STA: S4.PS.KI.5.1c

43. ANS: B PTS: 1 DIF: B OBJ: 6/2
STA: S4.PS.KI.5.1c

44. ANS: B PTS: 1 DIF: B OBJ: 6/2

45. ANS: A PTS: 1 DIF: B OBJ: 4/1
STA: S4.PS.KI.5.1d

46. ANS: A PTS: 1 DIF: B OBJ: 7/2

47. ANS: A PTS: 1 DIF: B OBJ: 6/2
STA: S4.PS.KI.5.1c

48. ANS: A PTS: 1 DIF: B OBJ: 1/1
STA: S4.PS.KI.5.1d

49. ANS: C PTS: 1 DIF: B OBJ: 6/2
STA: S4.PS.KI.5.2a

50. ANS: A PTS: 1 DIF: B OBJ: 6/2
STA: S4.PS.KI.5.2a

51. ANS: A PTS: 1 DIF: B OBJ: 9/3
STA: S4.PS.KI.5.1e

52. ANS: B PTS: 1 DIF: B OBJ: 9/3
STA: S4.PS.KI.5.1d

53. ANS: C PTS: 1 DIF: B OBJ: 9/3

54. ANS: D PTS: 1 DIF: B OBJ: 9/3
STA: S4.PS.KI.5.1e

55. ANS: B PTS: 1 DIF: B OBJ: 9/3
STA: S4.PS.KI.5.1d

56. ANS: A PTS: 1 DIF: B OBJ: 10/3
STA: S4.PS.KI.5.1e

57. ANS: D PTS: 1 DIF: A OBJ: 1/1
STA: S4.PS.KI.5.1c

58. ANS: C PTS: 1 DIF: A OBJ: 1/1
STA: S4.PS.KI.5.1c

59. ANS: D PTS: 1 DIF: A OBJ: 5/2

60. ANS: D PTS: 1 DIF: A OBJ: 6/2
STA: S4.PS.KI.5.1c

61. ANS: D PTS: 1 DIF: A OBJ: 7/2
STA: S4.PS.KI.5.1c

62. ANS: B PTS: 1 DIF: A OBJ: 7/2
STA: S4.PS.KI.5.1c

63. ANS: D PTS: 1 DIF: B OBJ: 1/1

64. ANS: A PTS: 1 DIF: B OBJ: 1/1
STA: S4.PS.KI.4.1e
65. ANS: B PTS: 1 DIF: B OBJ: 1/1
66. ANS: C PTS: 1 DIF: B OBJ: 1/1
67. ANS: B PTS: 1 DIF: B OBJ: 1/1
STA: S4.PS.KI.5.2a
68. ANS: A PTS: 1 DIF: B OBJ: 2/1
69. ANS: D PTS: 1 DIF: B OBJ: 5/2
70. ANS: C PTS: 1 DIF: B OBJ: 5/2
STA: S4.PS.KI.4.5b
71. ANS: A PTS: 1 DIF: B OBJ: 7/2
STA: S4.PS.KI.4.5a
72. ANS: D PTS: 1 DIF: B OBJ: 1/1
73. ANS: C PTS: 1 DIF: B OBJ: 9/3
74. ANS: C PTS: 1 DIF: B OBJ: 9/3
STA: S4.PS.KI.5.2g
75. ANS: D PTS: 1 DIF: B OBJ: 5/2
STA: S4.PS.KI.5.2g
76. ANS: B PTS: 1 DIF: B OBJ: 9/3
STA: S4.PS.KI.5.2g
77. ANS: D PTS: 1 DIF: B OBJ: 4/1
78. ANS: C PTS: 1 DIF: B OBJ: 6/2
79. ANS: D PTS: 1 DIF: B OBJ: 9/3
STA: S4.PS.KI.5.2g
80. ANS: D PTS: 1 DIF: B OBJ: 9/3
STA: S4.PS.KI.5.2g
81. ANS: D PTS: 1 DIF: B OBJ: 10/3
82. ANS: C PTS: 1 DIF: B OBJ: 9/3
STA: S4.PS.KI.5.2g
83. ANS: A PTS: 1 DIF: B OBJ: 9/3
STA: S4.PS.KI.5.2g
84. ANS: B PTS: 1 DIF: B OBJ: 4/1
85. ANS: C PTS: 1 DIF: B OBJ: 10/3
86. ANS: C PTS: 1 DIF: B OBJ: 9/3
STA: S4.PS.KI.5.2g
87. ANS: A PTS: 1 DIF: B OBJ: 9/3
STA: S4.PS.KI.5.2g
88. ANS: A PTS: 1 DIF: B OBJ: 9/3
STA: S4.PS.KI.5.2g

**TRUE/FALSE**

89. ANS: F PTS: 1 DIF: B OBJ: 1/1
STA: S4.PS.KI.5.1c
90. ANS: F PTS: 1 DIF: B OBJ: 3/1
STA: S4.PS.KI.5.2a
91. ANS: F PTS: 1 DIF: B OBJ: 1/1
92. ANS: F PTS: 1 DIF: B OBJ: 9/3

STA: S4.PS.KI.5.1d

93. ANS: F PTS: 1 DIF: B OBJ: 6/2

94. ANS: T PTS: 1 DIF: B OBJ: 3/1
STA: S4.PS.KI.5.2a

95. ANS: F PTS: 1 DIF: A OBJ: 1/1
STA: S4.PS.KI.5.1c

96. ANS: F PTS: 1 DIF: B OBJ: 9/3
STA: S4.PS.KI.5.1e

97. ANS: T PTS: 1 DIF: B OBJ: 6/2

98. ANS: F PTS: 1 DIF: B OBJ: 2/1

99. ANS: T PTS: 1 DIF: B OBJ: 1/1
STA: S4.PS.KI.4.1e

100. ANS: T PTS: 1 DIF: B OBJ: 1/1

101. ANS: T PTS: 1 DIF: B OBJ: 1/1

102. ANS: T PTS: 1 DIF: B OBJ: 7/2
STA: S4.PS.KI.4.1e

103. ANS: F PTS: 1 DIF: B OBJ: 7/2
STA: S4.PS.KI.4.1a

104. ANS: F PTS: 1 DIF: B OBJ: 1/1

105. ANS: T PTS: 1 DIF: B OBJ: 1/1
STA: S4.PS.KI.4.1e

106. ANS: T PTS: 1 DIF: A OBJ: 5/2
STA: S4.PS.KI.4.1d

107. ANS: F PTS: 1 DIF: B OBJ: 1/1

108. ANS: F PTS: 1 DIF: B OBJ: 1/1
STA: S4.PS.KI.4.1e

109. ANS: T PTS: 1 DIF: A OBJ: 2/1
STA: S4.LS.KI.5.2b

110. ANS: T PTS: 1 DIF: A OBJ: 2/1
STA: S4.PS.KI.4.1d

111. ANS: F PTS: 1 DIF: B OBJ: 5/2

112. ANS: F PTS: 1 DIF: B OBJ: 5/2
STA: S4.PS.KI.4.5a

113. ANS: T PTS: 1 DIF: B OBJ: 5/2
STA: S4.PS.KI.5.2f

114. ANS: T PTS: 1 DIF: B OBJ: 9/3
STA: S4.PS.KI.5.2g

115. ANS: T PTS: 1 DIF: B OBJ: 1/1

**MODIFIED TRUE/FALSE**

116. ANS: T PTS: 1 DIF: B
OBJ: 1/1 STA: S4.PS.KI.5.1a

117. ANS: F, position

PTS: 1 DIF: B OBJ: 1/1 STA: S4.PS.KI.5.1b

118. ANS: F, velocity

PTS: 1 DIF: B OBJ: 2/1 STA: S4.PS.KI.5.1a
119. ANS: F, total travel time

PTS: 1 DIF: B OBJ: 2/1 STA: S4.PS.KI.5.1b
120. ANS: T PTS: 1 DIF: B
OBJ: 2/1 STA: S4.PS.KI.5.1b
121. ANS: T PTS: 1 DIF: B
OBJ: 4/2
122. ANS: F, negative

PTS: 1 DIF: B OBJ: 5/2
123. ANS: F, positive

PTS: 1 DIF: B OBJ: 5/2 STA: S4.PS.KI.5.1c
124. ANS: F, velocity

PTS: 1 DIF: B OBJ: 6/2
125. ANS: F, balanced

PTS: 1 DIF: B OBJ: 8/3 STA: S4.PS.KI.5.1c
126. ANS: F, an unbalanced

PTS: 1 DIF: B OBJ: 7/3 STA: S4.PS.KI.5.1c
127. ANS: T PTS: 1 DIF: B
OBJ: 9/3 STA: S4.PS.KI.5.1c
128. ANS: F, stronger

PTS: 1 DIF: B OBJ: 6/2 STA: S4.PS.KI.5.1d
129. ANS: F, gravity

PTS: 1 DIF: B OBJ: 6/2 STA: S4.PS.KI.5.2a
130. ANS: F, sliding

PTS: 1 DIF: B OBJ: 2/1
131. ANS: T PTS: 1 DIF: B
OBJ: 2/1
132. ANS: F, kinetic

PTS: 1 DIF: B OBJ: 1/1 STA: S4.PS.KI.4.1e
133. ANS: T PTS: 1 DIF: B
OBJ: 5/2 STA: S4.PS.KI.4.5a
134. ANS: F, potential

PTS: 1 DIF: B OBJ: 1/1 STA: S4.PS.KI.4.1e
135. ANS: T PTS: 1 DIF: B
OBJ: 5/2 STA: S4.PS.KI.5.4d
136. ANS: F, cannot

PTS: 1 DIF: B OBJ: 7/2 STA: S4.PS.KI.4.5a

137. ANS: F, potential

PTS: 1 DIF: B OBJ: 1/1 STA: S4.PS.KI.4.1e

138. ANS: T PTS: 1 DIF: B
OBJ: 1/1 STA: S4.LS.KI.5.2a

139. ANS: F, mechanical

PTS: 1 DIF: B OBJ: 1/1 STA: S4.LS.KI.5.2a

140. ANS: T PTS: 1 DIF: B
OBJ: 1/1

141. ANS: F, Elastic potential

PTS: 1 DIF: B OBJ: 1/1 STA: S4.PS.KI.4.1e

142. ANS: T PTS: 1 DIF: B
OBJ: 1/1 STA: S4.PS.KI.4.1e

143. ANS: F, Ideal

PTS: 1 DIF: B OBJ: 6/2

144. ANS: F, time

PTS: 1 DIF: B OBJ: 4/1

145. ANS: T PTS: 1 DIF: B
OBJ: 10/3

146. ANS: F, thermal

PTS: 1 DIF: A OBJ: 7/2 STA: S4.PS.KI.5.2e

147. ANS: F, efficiency

PTS: 1 DIF: A OBJ: 7/2 STA: S4.PS.KI.5.2e