Student Name: _____ Date: _____

Module Test: Mechanical Energy

1) When there is friction between surfaces, energy is transferred out of a system as _____ energy.

- ○ **A)** thermal
- ○ **B)** chemical
- ○ **C)** radiant
- ○ **D)** electrical

2) Kinetic energy is the energy of _____.

3) The potential energy of an object depends on its _____ and its height.

4) The law of _____ of energy states that energy can be neither created nor destroyed, but it can change its form.

5) Stored energy is called _____ energy.

6) When you move your hand or foot, your body has converted potential energy into _____ energy.

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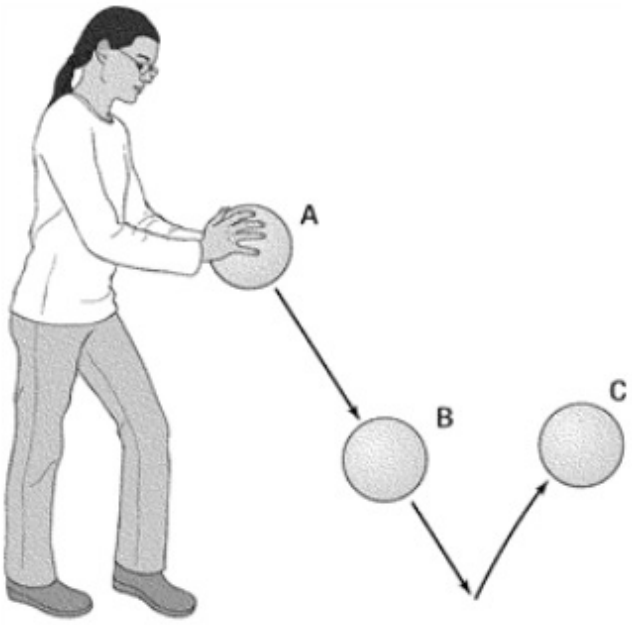
Module Test: Mechanical Energy

7) Name two ways you could <u>decrease</u> the potential energy of a bucket full of water sitting on a bench.

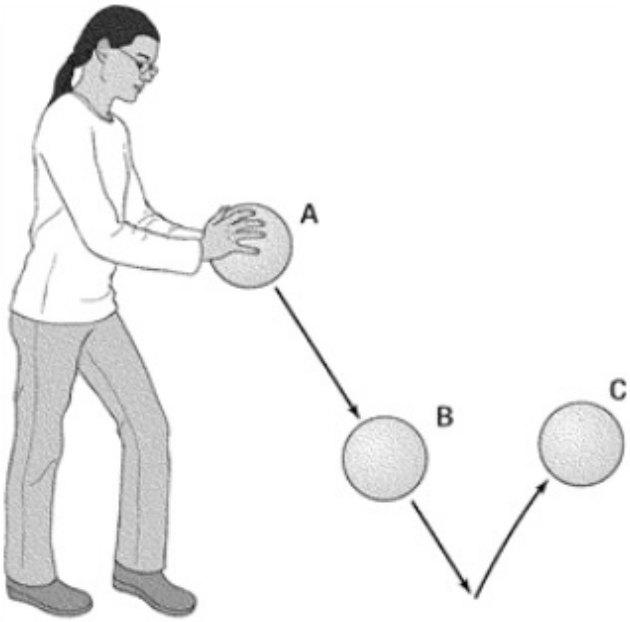
8) A rubber ball is dropped and bounces back up. The ball has _____.



- ○ **A)** zero potential energy at A
- ○ **B)** zero kinetic energy at C
- ○ **C)** both kinetic and potential energy at A
- ○ **D)** both kinetic and potential energy at C

Module Test: Mechanical Energy

9) A rubber ball is dropped and bounces back up. The ball's potential energy _____.



- **A)** is greater at C than at A
- **B)** is the same as its kinetic energy at A
- **C)** is at its maximum at A
- **D)** is zero at B

10) When coasting while roller skating, you eventually stop due to _____.

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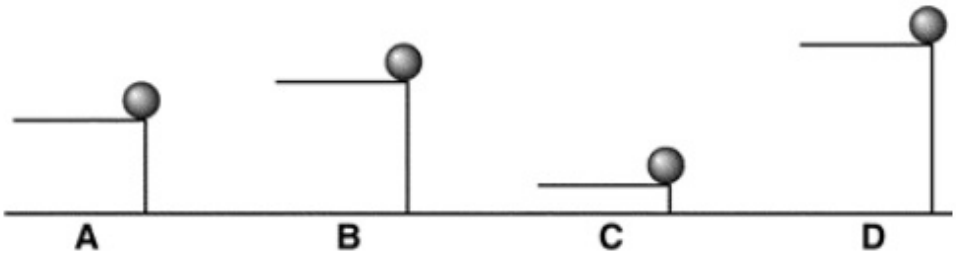
Module Test: Mechanical Energy

11) In which diagram does the ball have the greatest potential energy?



- **A)** A
- **B)** B
- **C)** C
- **D)** D

12) A ball has 100 J of potential energy when it is on a shelf. The kinetic energy of the ball the instant it hits the floor is _____ J.

13) Which best describes the changes in energy as a child goes down a slide?

- **A)** potential energy decreases and kinetic energy increases
- **B)** potential energy is constant and kinetic energy increases
- **C)** potential and kinetic energy are constant
- **D)** mechanical energy decreases

14) The combined total of the kinetic and potential energy in a system is called _____.

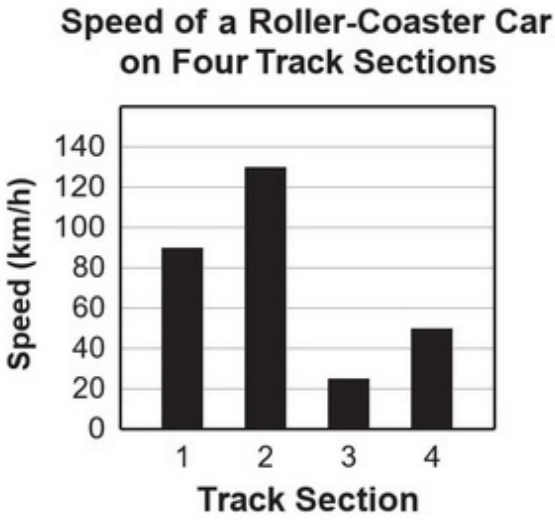
- **A)** radiant energy
- **B)** nuclear energy
- **C)** potential kinetic energy
- **D)** mechanical energy

Module Test: Mechanical Energy

15) A coiled spring used to help a door close has _____ _____ energy when the door is open.

16) After braking, a bicycle's tires increase in temperature as friction causes some of the mechanical energy to transfer to _____ energy.

17) The graph shows the average speed of a car on four different track sections of a roller coaster.



Which statement is false?

- **A)** The car's kinetic energy is greatest in track section 2.
- **B)** Track section 2 is likely at the top of a hill.
- **C)** Track section 2 is likely at the bottom of a hill.
- **D)** The car's kinetic energy varies even though its mechanical energy remains almost constant.

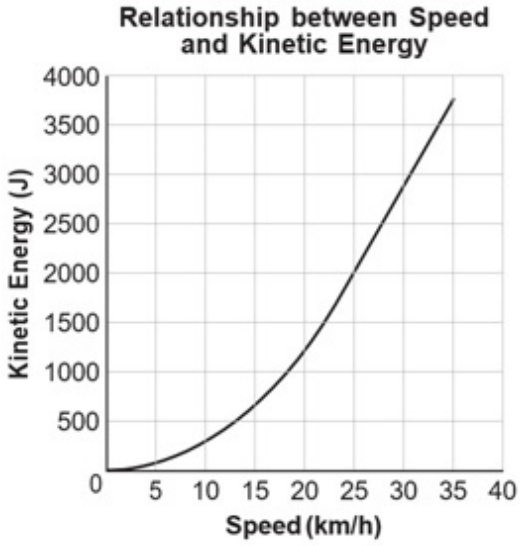
Module Test: Mechanical Energy

18) A bicycle and rider have a total mass of 80 kilograms. This table lists the kinetic energy of the bicycle and rider at different speeds.

Kinetic Energy at Different Speeds

Speed (km/h)	Kinetic Energy (joules)
35	3780
20	1230
10	310
5	80
0	0

The line graph shows the relationship between the speed and kinetic energy of the bicycle and rider.



Describe the relationship between the speed and kinetic energy of the bicycle and rider. In your description, include whether the relationship is linear or nonlinear.

Module Test: Mechanical Energy

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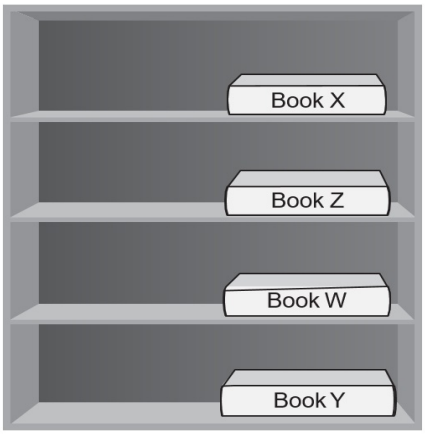
19) A teacher places four books of different masses in a bookcase. The diagram shows the placement of the four books.



The teacher states that the books are arranged in the bookcase for the lowest overall potential energy when only one book is on each shelf.

a. Use inequality symbols (<, >) to identify the relationship among the masses of all four books.

Module Test: Mechanical Energy

b. Describe how the arrangement of the books can be changed for the greatest overall potential energy when only one book is on each shelf.