Name _____

Conservation Of Energy (p. 293 – 301)

I. Conservation Of Energy

1. **Define the term law of conservation of energy.**

Ex. Newton's Cradle

Law Of Conservation Of Energy – in a closed, isolated system, energy can neither be created or destroyed; rather, energy is transformed or conserved

2. **Energy changes from one form to another while the total energy of the system remains constant.**

p. 293

Circle One : (True) False

3. **Define the term mechanical energy.**

Mechanical Energy – total amount of potential + kinetic energy in a system

4. **Write the formula used to determine mechanical energy of a system.**

$ME = KE + PE$

5. **Write the formula used to determine conservation of mechanical energy.**

Middle p. 294

$KE_{before} + PE_{before} = KE_{after} + PE_{after}$

6. **In the absence of friction, which situation produces greater energy?**

Top p. 294

Circle One : 1. A ball dropped following a vertical path to the ground.

Neither One

2. A ball rolling down a ramp the same distance as the dropped ball.

7. **Explain how each of the following illustrate conservation of energy.**

Ex. - Pop-fly - Pole-Vaulter - Swings

1. Roller Coasters : Hills always have to be smaller than the first.
2. Skiing : Gravitational PE converted into KE (and speed)
3. Pendulums : Release = ↑ PE, ↓ KE / Bottom = ↓ PE, ↑ KE

8. **In what ways is energy transformed in each example?**

1. Roller Coasters : Friction, Air Resistance, Thermal Energy
2. Skiing : Friction, Air Resistance, Gravity Loss
3. Pendulums : Air Resistance, Friction, Gravity Loss

Name _____

II. Analyzing Collisions

1. **Define the term superelastic collision.**

Superelastic Collision (Explosive Collision) – collision in which kinetic energy is added to a system

Ex. Compressed spring released → Destroys parts around it.

2. **What happens to the kinetic energy of the system in a superelastic collision?**

– Kinetic energy increases

3. **Define the term elastic collision.**

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Elastic Collision – collision in which kinetic energy + momentum are conserved

(Hard, elastic objects)

4. **What types of materials are typically involved in elastic collisions?**

Marbles

1. Steel 2. Glass 3. Hard Plastic

5. **Write the formulas used to determine the outcomes of elastic collisions.**

Conservation of Kinetic Energy : $\frac{1}{2}m_1v_{1i}^2 + \frac{1}{2}m_2v_{2i}^2 = \frac{1}{2}m_1v_{1f}^2 + \frac{1}{2}m_2v_{2f}^2$

Conservation Of Momentum : $m_1v_{1i} + m_2v_{2i} = m_1v_{1f} + m_2v_{2f}$

6. **Define the term inelastic collision.**

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Inelastic Collision – collision in which momentum in conserved (not kinetic energy)

4. **What types of materials are typically involved in inelastic collisions?**

Soft, sticky objects

1. Clay 2. Cars (wrecks) 3. Basketballs

5. **Write the formulas used to determine the outcomes of inelastic collisions.**

Conservation Of Momentum : $m_1v_{1i} + m_2v_{2i} = m_1v_{1f} + m_2v_{2f}$

6. **In an automobile collision, the ~~energy~~ momentum stops the car, but the ~~momentum~~ energy causes the damage**

Circle One : True (False)

7. **Explain a situation in which a collision occurs when nothing collides.**

(1.) Two carts are attached to a spring sitting motionless. (Momentum = zero) (2) As spring is released, carts move away from each other (until momentum = zero)