**Work and Energy**

**Questions from a Conceptual Course**

**Category 1: Concepts of Work, Energy and Power**

**Question 1:**

aa. Which phrase best defines the term *energy*?

a. Energy is *the* *ability to do work*.

b. Energy is *the force and object can exert*.

c. Energy is *the amount of matter present in an object*.

d. Energy is *the amount of heat an object can give off*.

**Question 2:**

aa. If an object has energy, then one can be certain that it \_\_\_\_.

a. is moving

b. it is at a high temperature

c. is raised above the ground

d. has the ability to do work on another object

**Kinetic Energy Concepts**

**Question 3:**

aa. Which is the best definition of the term *kinetic energy*?

a. Kinetic energy is the energy due to motion.

b. Kinetic energy is the work that an object does.

c. Kinetic energy is the energy due to temperature.

d. Kinetic energy is the energy stored in an object due to vertical position (height).

**Question 4:**

aa. Which statement is always true of an object that has kinetic energy?

a. The object is at rest.

b. The object is moving.

c. The object is on the ground.

d. The object is moving on the ground.

e. The object is moving through the air.

**Question 5:**

aa. What factors does the kinetic energy of an object depend upon?

a. mass and volume b. mass and height

c. force and distance d. mass and speed

**Question 6:**

aa. Under which of these conditions would the kinetic energy of an object increase?

a. The weight of the object decreases.

b. The object increases its temperature.

c. The speed of the object increases.

d. The momentum of the object decreases.

**Question 7:**

aa. Which of the following changes would cause the kinetic energy of an object to increase?

a. The mass of the object changes.

b. The height of the object changes.

c. The speed of the object increases.

d. The object does work on another object.

**Question 8:**

aa. Which of the following changes would cause the kinetic energy of an object to increase?

a. The speed of the object changes.

b. The mass of the object increases.

c. The height of the object decreases.

d. The object does work on another object.

**Question 9:**

aa. An object is moving horizontally at a constant speed. Which one of the following statements is true of the object?

a. Its kinetic energy is constant.

b. Its kinetic energy is increasing.

c. Its kinetic energy is decreasing.

**Question 10:**

aa. An object is moving uphill at a constant speed. Which one of the following statements is true of the object?

a. Its kinetic energy is constant.

b. Its kinetic energy is increasing.

c. Its kinetic energy is decreasing.

**Question 11:**

aa. An object is moving downhill at a constant speed. Which one of the following statements is true of the object?

a. Its kinetic energy is constant.

b. Its kinetic energy is increasing.

c. Its kinetic energy is decreasing.

**Question 12:**

aa. An object is moving horizontally and speeding up. Which one of the following statements is true of the object?

a. Its kinetic energy is constant.

b. Its kinetic energy is increasing.

c. Its kinetic energy is decreasing.

**Question 13:**

aa. An object is moving horizontally and slowing down. Which one of the following statements is true of the object?

a. Its kinetic energy is constant.

b. Its kinetic energy is increasing.

c. Its kinetic energy is decreasing.

**Question 14:**

aa. An object is moving horizontally and increasing its speed. Which one of the following statements is true of the object?

a. Its kinetic energy is constant.

b. Its kinetic energy is increasing.

c. Its kinetic energy is decreasing.

**Question 15:**

aa. An object is moving horizontally and decreasing its speed. Which one of the following statements is true of the object?

a. Its kinetic energy is constant.

b. Its kinetic energy is increasing.

c. Its kinetic energy is decreasing.

**Question 16:**

aa. An object is moving uphill and slowing down. Which one of the following statements is true of the object?

a. Its kinetic energy is constant.

b. Its kinetic energy is increasing.

c. Its kinetic energy is decreasing.

**Question 17:**

aa. An object is moving up a short incline and speeding up. Which one of the following statements is true of the object?

a. Its kinetic energy is constant.

b. Its kinetic energy is increasing.

c. Its kinetic energy is decreasing.

**Question 18:**

a. An object is moving down a gently sloped hill and slowing down. Which one of the following statements is true of the object?

a. Its kinetic energy is constant.

b. Its kinetic energy is increasing.

c. Its kinetic energy is decreasing.

**Question 19:**

aa. A skydiver is falling through the air at a constant speed. Which one of the following statements is true of the skydiver?

a. Its kinetic energy is constant.

b. Its kinetic energy is increasing.

c. Its kinetic energy is decreasing.

**Question 20:**

aa. A bicyclist is cycling up a hill at a constant speed. Which one of the following statements is true of the bicyclist?

a. Its kinetic energy is constant.

b. Its kinetic energy is increasing.

c. Its kinetic energy is decreasing.

**Question 21:**

aa. A physics teacher is jogging down a level street at a constant speed. Which one of the following statements is true of the physics teacher?

a. Its kinetic energy is constant.

b. Its kinetic energy is increasing.

c. Its kinetic energy is decreasing.

**Question 22:**

aa. A car is skidding to a stop as it approaches the corner of Lake and Milwaukee Avenue. Which one of the following statements is true of the car?

a. Its kinetic energy is constant.

b. Its kinetic energy is increasing.

c. Its kinetic energy is decreasing.

**Question 23:**

aa. The light turns green and a driver steps on the gas, accelerating the car to a high speed. Which one of the following statements is true of the car?

a. Its kinetic energy is constant.

b. Its kinetic energy is increasing.

c. Its kinetic energy is decreasing.

**Question 24:**

aa. A skier is moving down a hill and speeding up? Which one of the following statements is true of the skier?

a. Its kinetic energy is constant.

b. Its kinetic energy is increasing.

c. Its kinetic energy is decreasing.

**Question 25:**

aa. A child is sledding down a hill and speeding up? Which one of the following statements is true of the child?

a. Its kinetic energy is constant.

b. Its kinetic energy is increasing.

c. Its kinetic energy is decreasing.

**Question 26:**

aa. A child is sledding down a gently-sloped hill and slowing down? Which one of the following statements is true of the child?

a. Its kinetic energy is constant.

b. Its kinetic energy is increasing.

c. Its kinetic energy is decreasing.

**Question 27:**

aa. A car is driving up a gently-sloped hill and increasing its speed. Which one of the following statements is true of the car?

a. Its kinetic energy is constant.

b. Its kinetic energy is increasing.

c. Its kinetic energy is decreasing.

**Question 28:**

aa. A car is driving up a steep hill at a constant speed. Which one of the following statements is true of the car?

a. Its kinetic energy is constant.

b. Its kinetic energy is increasing.

c. Its kinetic energy is decreasing.

**Question 29:**

aa. A roller coaster car is moving along a horizontal section of track towards the loading station and slowing down to a stop. Which one of the following statements is true of the roller coaster car?

a. Its kinetic energy is constant.

b. Its kinetic energy is increasing.

c. Its kinetic energy is decreasing.

**Question 30:**

aa. A roller coaster car is falling along the first drop of the track and speeding up. Which one of the following statements is true of the roller coaster car?

a. Its kinetic energy is constant.

b. Its kinetic energy is increasing.

c. Its kinetic energy is decreasing.

**Question 31:**

aa. A roller coaster car is moving upward towards the top of a loop and slowing down. Which one of the following statements is true of the roller coaster car?

a. Its kinetic energy is constant.

b. Its kinetic energy is increasing.

c. Its kinetic energy is decreasing.

a

**Question 32:**

aa. A roller coaster car is moving through a horizontal turn at a constant speed. Which one of the following statements is true of the roller coaster car?

a. Its kinetic energy is constant.

b. Its kinetic energy is increasing.

c. Its kinetic energy is decreasing.

**Question 33:**

aa. An ice skater is moving across the skating rink at a constant speed. Which one of the following statements is true of the ice skater?

a. Its kinetic energy is constant.

b. Its kinetic energy is increasing.

c. Its kinetic energy is decreasing.

**Question 34:**

aa. An ice skater is moving across the skating rink and speeding up. Which one of the following statements is true of the ice skater?

a. Its kinetic energy is constant.

b. Its kinetic energy is increasing.

c. Its kinetic energy is decreasing.

**Question 35:**

aa. An ice skater is moving across the skating rink and slowing down. Which one of the following statements is true of the ice skater?

a. Its kinetic energy is constant.

b. Its kinetic energy is increasing.

c. Its kinetic energy is decreasing.

**Question 36:**

aa. An egg free falls from the second floor of the pit to the first floor of the pit. Which one of the following statements is true of the egg?

a. Its kinetic energy is constant.

b. Its kinetic energy is increasing.

c. Its kinetic energy is decreasing.

**Question 37:**

aa. A rolling marble slows to a stop while rolling across a tabletop. Which one of the following statements is true of the marble?

a. Its kinetic energy is constant.

b. Its kinetic energy is increasing.

c. Its kinetic energy is decreasing.

**Question 38:**

aa. A small hill is made by propping a ruler up on top of a Dominoes stack at one end. A marble rolls down the hill. Which one of the following statements is true of the marble?

a. Its kinetic energy is constant.

b. Its kinetic energy is increasing.

c. Its kinetic energy is decreasing.

**Potential Energy Concepts**

**Question 39:**

aa. Which is the best definition of the term *potential energy*?

a. Potential energy is the energy due to motion.

b. Potential energy is the work that an object does.

c. Potential energy is the energy due to temperature.

d. Potential energy is the energy stored in an object due to vertical position (height)

**Question 40:**

aa. Which statement is always true of an object that has potential energy?

a. The object is at rest.

b. The object is moving.

c. The object is above the ground.

d. The object is moving through the air.

e. The object is at rest and above the ground.

**Question 41:**

aa. What does the potential energy of an object depend upon?

a. The object mass and speed. b. The object mass and volume.

c. The object force and distance. d. The object height and temperature.

e. The object mass and height above the ground.

**Question 42:**

aa. An object is moving horizontally at a constant speed. Which one of the following statements is true of the object?

a. Its potential energy is constant.

b. Its potential energy is increasing.

c. Its potential energy is decreasing.

**Question 43:**

aa. An object is moving uphill at a constant speed. Which one of the following statements is true of the object?

a. Its potential energy is constant.

b. Its potential energy is increasing.

c. Its potential energy is decreasing.

**Question 44:**

aa. An object is moving downhill at a constant speed. Which one of the following statements is true of the object?

a. Its potential energy is constant.

b. Its potential energy is increasing.

c. Its potential energy is decreasing.

**Question 45:**

aa. An object is moving horizontally and speeding up. Which one of the following statements is true of the object?

a. Its potential energy is constant.

b. Its potential energy is increasing.

c. Its potential energy is decreasing.

**Question 46:**

aa. An object is moving horizontally and slowing down. Which one of the following statements is true of the object?

a. Its potential energy is constant.

b. Its potential energy is increasing.

c. Its potential energy is decreasing.

**Question 47:**

aa. An object is moving horizontally and increasing its speed. Which one of the following statements is true of the object?

a. Its potential energy is constant.

b. Its potential energy is increasing.

c. Its potential energy is decreasing.

**Question 48:**

aa. An object is moving horizontally and decreasing its speed. Which one of the following statements is true of the object?

a. Its potential energy is constant.

b. Its potential energy is increasing.

c. Its potential energy is decreasing.

**Question 49:**

aa. An object is moving uphill and slowing down. Which one of the following statements is true of the object?

a. Its potential energy is constant.

b. Its potential energy is increasing.

c. Its potential energy is decreasing.

**Question 50:**

aa. An object is moving up a short incline and speeding up. Which one of the following statements is true of the object?

a. Its potential energy is constant.

b. Its potential energy is increasing.

c. Its potential energy is decreasing.

**Question 51:**

aa. An object is moving down a gently sloped hill and slowing down. Which one of the following statements is true of the object?

a. Its potential energy is constant.

b. Its potential energy is increasing.

c. Its potential energy is decreasing.

**Question 52:**

aa. A skydiver is falling through the air at a constant speed. Which one of the following statements is true of the skydiver?

a. Its potential energy is constant.

b. Its potential energy is increasing.

c. Its potential energy is decreasing.

**Question 53:**

aa. A bicyclist is cycling up a hill at a constant speed. Which one of the following statements is true of the bicyclist?

a. Its potential energy is constant.

b. Its potential energy is increasing.

c. Its potential energy is decreasing.

**Question 54:**

aa. A physics teacher is jogging down a level street at a constant speed. Which one of the following statements is true of the physics teacher?

a. Its potential energy is constant.

b. Its potential energy is increasing.

c. Its potential energy is decreasing.

**Question 55:**

aa. A car is skidding to a stop as it approaches the corner of State Street and Madison Avenue. Which one of the following statements is true of the car?

a. Its potential energy is constant.

b. Its potential energy is increasing.

c. Its potential energy is decreasing.

**Question 56:**

aa. The light turns green and a driver steps on the gas, accelerating the car to a high speed. Which one of the following statements is true of the car?

a. Its potential energy is constant.

b. Its potential energy is increasing.

c. Its potential energy is decreasing.

**Question 57:**

aa. A skier is moving down a hill and speeding up. Which one of the following statements is true of the skier?

a. Its potential energy is constant.

b. Its potential energy is increasing.

c. Its potential energy is decreasing.

**Question 58:**

aa. A child is sledding down a hill and speeding up. Which one of the following statements is true of the child?

a. Its potential energy is constant.

b. Its potential energy is increasing.

c. Its potential energy is decreasing.

**Question 59:**

aa. A child is sledding down a gently-sloped hill and slowing down. Which one of the following statements is true of the child?

a. Its potential energy is constant.

b. Its potential energy is increasing.

c. Its potential energy is decreasing.

**Question 60:**

aa. A car is driving up a gently-sloped hill and increasing its speed. Which one of the following statements is true of the car?

a. Its potential energy is constant.

b. Its potential energy is increasing.

c. Its potential energy is decreasing.

**Question 61:**

aa. A car is driving up a steep hill at a constant speed. Which one of the following statements is true of the car?

a. Its potential energy is constant.

b. Its potential energy is increasing.

c. Its potential energy is decreasing.

**Question 62:**

aa. A roller coaster car is moving along a horizontal section of track towards the loading station and slowing down to a stop. Which one of the following statements is true of the roller coaster car?

a. Its potential energy is constant.

b. Its potential energy is increasing.

c. Its potential energy is decreasing.

**Question 63:**

aa. A roller coaster car is falling along the first drop of the track and speeding up. Which one of the following statements is true of the roller coaster car?

a. Its potential energy is constant.

b. Its potential energy is increasing.

c. Its potential energy is decreasing.

**Question 64:**

aa. A roller coaster car is moving upward towards the top of a loop and slowing down. Which one of the following statements is true of the roller coaster car?

a. Its potential energy is constant.

b. Its potential energy is increasing.

c. Its potential energy is decreasing.

**Question 65:**

aa. A roller coaster car is moving through a horizontal turn at a constant speed. Which one of the following statements is true of the roller coaster car?

a. Its potential energy is constant.

b. Its potential energy is increasing.

c. Its potential energy is decreasing.

**Question 66:**

aa. An ice skater is moving across the skating rink at a constant speed. Which one of the following statements is true of the ice skater?

a. Its potential energy is constant.

b. Its potential energy is increasing.

c. Its potential energy is decreasing.

**Question 67:**

aa. An ice skater is moving across the skating rink and speeding up. Which one of the following statements is true of the ice skater?

a. Its potential energy is constant.

b. Its potential energy is increasing.

c. Its potential energy is decreasing.

**Question 68:**

aa. An ice skater is moving across the skating rink and slowing down. Which one of the following statements is true of the ice skater?

a. Its potential energy is constant.

b. Its potential energy is increasing.

c. Its potential energy is decreasing.

**Question 69:**

aa. An egg free falls from the second floor of the pit to the first floor of the pit. Which one of the following statements is true of the egg?

a. Its potential energy is constant.

b. Its potential energy is increasing.

c. Its potential energy is decreasing.

**Question 70:**

aa. A rolling marble slows to a stop while rolling across a tabletop. Which one of the following statements is true of the marble?

a. Its potential energy is constant.

b. Its potential energy is increasing.

c. Its potential energy is decreasing.

**Question 71:**

aa. A small hill is made by propping a ruler on top of a Dominoes stack. A marble rolls down the hill. Which one of the following statements is true of the marble?

a. Its potential energy is constant.

b. Its potential energy is increasing.

c. Its potential energy is decreasing.

**Kinetic and Potential Energy Concepts**

**Question 72:**

aa. An object is moving horizontally at a constant speed. Which one of the following statements is true of the object?

a. Both its kinetic energy and its potential energy is constant.

b. Its kinetic energy is increasing and its potential energy is decreasing.

c. Its kinetic energy is decreasing and its potential energy is increasing.

d. Its kinetic energy is increasing and its potential energy is constant.

e. Its kinetic energy is constant and its potential energy is increasing.

**Question 73:**

aa. An object is moving uphill at a constant speed. Which one of the following statements is true of the object?

a. Both its kinetic energy and its potential energy are constant.

b. Its kinetic energy is increasing and its potential energy is decreasing.

c. Its kinetic energy is decreasing and its potential energy is increasing.

d. Its kinetic energy is increasing and its potential energy is constant.

e. Its kinetic energy is constant and its potential energy is increasing.

**Question 74:**

aa. An object is moving downhill at a constant speed. Which one of the following statements is true of the object?

a. Both its kinetic energy and its potential energy are constant.

b. Its kinetic energy is increasing and its potential energy is decreasing.

c. Its kinetic energy is decreasing and its potential energy is increasing.

d. Its kinetic energy is decreasing and its potential energy is constant.

e. Its kinetic energy is constant and its potential energy is decreasing.

**Question 75:**

aa. An object is moving horizontally and speeding up. Which one of the following statements is true of the object?

a. Both its kinetic energy and its potential energy are constant.

b. Its kinetic energy is increasing and its potential energy is decreasing.

c. Its kinetic energy is decreasing and its potential energy is increasing.

d. Its kinetic energy is increasing and its potential energy is constant.

e. Its kinetic energy is constant and its potential energy is increasing.

**Question 76:**

aa. An object is moving horizontally and slowing down. Which one of the following statements is true of the object?

a. Both its kinetic energy and its potential energy are constant.

b. Its kinetic energy is increasing and its potential energy is decreasing.

c. Its kinetic energy is decreasing and its potential energy is increasing.

d. Its kinetic energy is decreasing and its potential energy is constant.

e. Its kinetic energy is constant and its potential energy is decreasing.

**Question 77:**

aa. An object is moving horizontally and increasing its speed. Which one of the following statements is true of the object?

a. Both its kinetic energy and its potential energy are constant.

b. Its kinetic energy is increasing and its potential energy is decreasing.

c. Its kinetic energy is decreasing and its potential energy is increasing.

d. Its kinetic energy is increasing and its potential energy is constant.

e. Its kinetic energy is constant and its potential energy is increasing.

**Question 78:**

aa. An object is moving horizontally and decreasing its speed. Which one of the following statements is true of the object?

a. Both its kinetic energy and its potential energy are constant.

b. Its kinetic energy is increasing and its potential energy is decreasing.

c. Its kinetic energy is decreasing and its potential energy is increasing.

d. Its kinetic energy is decreasing and its potential energy is constant.

e. Its kinetic energy is constant and its potential energy is decreasing.

**Question 79:**

aa. An object is moving uphill and slowing down. Which one of the following statements is true of the object?

a. Both its kinetic energy and its potential energy are constant.

b. Its kinetic energy is increasing and its potential energy is decreasing.

c. Its kinetic energy is decreasing and its potential energy is increasing.

d. Its kinetic energy is decreasing and its potential energy is constant.

e. Its kinetic energy is constant and its potential energy is increasing.

**Question 80:**

aa. An object is moving up a short incline and speeding up. Which one of the following statements is true of the object?

a. Both its kinetic energy and its potential energy are increasing.

b. Its kinetic energy is increasing and its potential energy is decreasing.

c. Its kinetic energy is decreasing and its potential energy is increasing.

d. Its kinetic energy is increasing and its potential energy is constant.

e. Its kinetic energy is constant and its potential energy is increasing.

**Question 81:**

aa. An object is moving down a gently sloped hill and slowing down. Which one of the following statements is true of the object?

a. Both its kinetic energy and its potential energy are decreasing.

b. Its kinetic energy is increasing and its potential energy is decreasing.

c. Its kinetic energy is decreasing and its potential energy is increasing.

d. Its kinetic energy is decreasing and its potential energy is constant.

e. Its kinetic energy is constant and its potential energy is decreasing.

**Question 82:**

aa. A skydiver is falling through the air at a constant speed. Which one of the following statements is true of the skydiver?

a. Both its kinetic energy and its potential energy are constant.

b. Its kinetic energy is increasing and its potential energy is decreasing.

c. Its kinetic energy is decreasing and its potential energy is increasing.

d. Its kinetic energy is decreasing and its potential energy is constant.

e. Its kinetic energy is constant and its potential energy is decreasing.

**Question 83:**

aa. A bicyclist is cycling up a hill at a constant speed. Which one of the following statements is true of the bicyclist?

a. Both its kinetic energy and its potential energy are constant.

b. Its kinetic energy is increasing and its potential energy is decreasing.

c. Its kinetic energy is decreasing and its potential energy is increasing.

d. Its kinetic energy is increasing and its potential energy is constant.

e. Its kinetic energy is constant and its potential energy is increasing.

**Question 84:**

aa. A physics teacher is jogging down a level street at a constant speed. Which one of the following statements is true of the physics teacher?

a. Both its kinetic energy and its potential energy are constant.

b. Its kinetic energy is increasing and its potential energy is decreasing.

c. Its kinetic energy is decreasing and its potential energy is increasing.

d. Its kinetic energy is increasing and its potential energy is constant.

e. Its kinetic energy is constant and its potential energy is increasing.

**Question 85:**

aa. A car is skidding to a stop as it approaches the corner of Lake and Milwaukee Avenue. Which one of the following statements is true of the car?

a. Both its kinetic energy and its potential energy are constant.

b. Its kinetic energy is increasing and its potential energy is decreasing.

c. Its kinetic energy is decreasing and its potential energy is increasing.

d. Its kinetic energy is decreasing and its potential energy is constant.

e. Its kinetic energy is constant and its potential energy is decreasing.

**Question 86:**

aa. The light turns green and a driver steps on the gas, accelerating the car to a high speed. Which one of the following statements is true of the car?

a. Both its kinetic energy and its potential energy are constant.

b. Its kinetic energy is increasing and its potential energy is decreasing.

c. Its kinetic energy is decreasing and its potential energy is increasing.

d. Its kinetic energy is increasing and its potential energy is constant.

e. Its kinetic energy is constant and its potential energy is increasing.

**Question 87:**

aa. A skier is moving down a hill and speeding up. Which one of the following statements is true of the skier?

a. Both its kinetic energy and its potential energy are increasing.

b. Its kinetic energy is increasing and its potential energy is decreasing.

c. Its kinetic energy is decreasing and its potential energy is increasing.

d. Its kinetic energy is increasing and its potential energy is constant.

e. Its kinetic energy is constant and its potential energy is decreasing.

**Question 88:**

aa. A child is sledding down a hill and speeding up. Which one of the following statements is true of the child?

a. Both its kinetic energy and its potential energy are increasing.

b. Its kinetic energy is increasing and its potential energy is decreasing.

c. Its kinetic energy is decreasing and its potential energy is increasing.

d. Its kinetic energy is increasing and its potential energy is constant.

e. Its kinetic energy is constant and its potential energy is decreasing.

**Question 89:**

aa. A child is sledding down a gently-sloped hill and slowing down. Which one of the following statements is true of the child?

a. Both its kinetic energy and its potential energy are decreasing.

b. Its kinetic energy is increasing and its potential energy is decreasing.

c. Its kinetic energy is decreasing and its potential energy is increasing.

d. Its kinetic energy is increasing and its potential energy is constant.

e. Its kinetic energy is constant and its potential energy is increasing.

**Question 90:**

aa. A car is driving up a gently-sloped hill and increasing its speed. Which one of the following statements is true of the car?

a. Both its kinetic energy and its potential energy are increasing.

b. Its kinetic energy is increasing and its potential energy is decreasing.

c. Its kinetic energy is decreasing and its potential energy is increasing.

d. Its kinetic energy is increasing and its potential energy is constant.

e. Its kinetic energy is constant and its potential energy is increasing.

**Question 91:**

aa. A car is driving up a steep hill at a constant speed. Which one of the following statements is true of the car?

a. Both its kinetic energy and its potential energy are constant.

b. Its kinetic energy is increasing and its potential energy is decreasing.

c. Its kinetic energy is decreasing and its potential energy is increasing.

d. Its kinetic energy is increasing and its potential energy is constant.

e. Its kinetic energy is constant and its potential energy is increasing.

**Question 92:**

aa. A roller coaster car is moving along a horizontal section of track towards the loading station and slowing down to a stop. Which one of the following statements is true of the roller coaster car?

a. Both its kinetic energy and its potential energy are constant.

b. Its kinetic energy is increasing and its potential energy is decreasing.

c. Its kinetic energy is decreasing and its potential energy is increasing.

d. Its kinetic energy is decreasing and its potential energy is constant.

e. Its kinetic energy is constant and its potential energy is decreasing.

**Question 93:**

aa. A roller coaster car is falling along the first drop of the track and speeding up. Which one of the following statements is true of the roller coaster car?

a. Both its kinetic energy and its potential energy are increasing.

b. Its kinetic energy is increasing and its potential energy is decreasing.

c. Its kinetic energy is decreasing and its potential energy is increasing.

d. Its kinetic energy is increasing and its potential energy is constant.

e. Its kinetic energy is constant and its potential energy is decreasing.

**Question 94:**

aa. A roller coaster car is moving upward towards the top of a loop and slowing down. Which one of the following statements is true of the roller coaster car?

a. Both its kinetic energy and its potential energy are decreasing.

b. Its kinetic energy is increasing and its potential energy is decreasing.

c. Its kinetic energy is decreasing and its potential energy is increasing.

d. Its kinetic energy is increasing and its potential energy is constant.

e. Its kinetic energy is constant and its potential energy is increasing.

**Question 95:**

aa. A roller coaster car is moving through a horizontal turn at a constant speed. Which one of the following statements is true of the roller coaster car?

a. Both its kinetic energy and its potential energy are constant.

b. Its kinetic energy is increasing and its potential energy is decreasing.

c. Its kinetic energy is decreasing and its potential energy is increasing.

d. Its kinetic energy is increasing and its potential energy is constant.

e. Its kinetic energy is constant and its potential energy is increasing.

**Question 96:**

aa. An ice skater is moving across the skating rink at a constant speed. Which one of the following statements is true of the ice skater?

a. Both its kinetic energy and its potential energy are constant.

b. Its kinetic energy is increasing and its potential energy is decreasing.

c. Its kinetic energy is decreasing and its potential energy is increasing.

d. Its kinetic energy is increasing and its potential energy is constant.

e. Its kinetic energy is constant and its potential energy is increasing.

**Question 97:**

aa. An ice skater is moving across the skating rink and speeding up. Which one of the following statements is true of the ice skater?

a. Both its kinetic energy and its potential energy are constant.

b. Its kinetic energy is increasing and its potential energy is decreasing.

c. Its kinetic energy is decreasing and its potential energy is increasing.

d. Its kinetic energy is increasing and its potential energy is constant.

e. Its kinetic energy is constant and its potential energy is increasing.

**Question 98:**

aa. An ice skater is moving across the skating rink and slowing down. Which one of the following statements is true of the ice skater?

a. Both its kinetic energy and its potential energy are constant.

b. Its kinetic energy is increasing and its potential energy is decreasing.

c. Its kinetic energy is decreasing and its potential energy is increasing.

d. Its kinetic energy is decreasing and its potential energy is constant.

e. Its kinetic energy is constant and its potential energy is decreasing.

**Question 99:**

aa. An egg free falls from the second floor of the pit to the first floor of the pit. Which one of the following statements is true of the egg?

a. Both its kinetic energy and its potential energy are constant.

b. Its kinetic energy is increasing and its potential energy is decreasing.

c. Its kinetic energy is decreasing and its potential energy is increasing.

d. Its kinetic energy is increasing and its potential energy is constant.

e. Its kinetic energy is constant and its potential energy is decreasing.

**Question 100:**

aa. A rolling marble slows to a stop while rolling across a tabletop. Which one of the following statements is true of the marble?

a. Both its kinetic energy and its potential energy are decreasing.

b. Its kinetic energy is increasing and its potential energy is decreasing.

c. Its kinetic energy is decreasing and its potential energy is increasing.

d. Its kinetic energy is decreasing and its potential energy is constant.

e. Its kinetic energy is constant and its potential energy is decreasing.

**Question 101:**

aa. A small hill is made by propping a ruler on top of a Dominoes stack. A marble rolls down the hill. Which one of the following statements is true of the marble?

a. Both its kinetic energy and its potential energy are decreasing.

b. Its kinetic energy is increasing and its potential energy is decreasing.

c. Its kinetic energy is decreasing and its potential energy is increasing.

d. Its kinetic energy is increasing and its potential energy is constant.

e. Its kinetic energy is constant and its potential energy is decreasing.

**Total Energy Concepts**

**Question 102:**

aa. The total mechanical energy possessed by an object is equal to \_\_\_\_.

a. its kinetic energy

b. its potential energy

c. its kinetic energy plus potential energy

d. its kinetic energy minus potential energy

e. its potential energy minus kinetic energy

**Question 103:**

aa. An object has 50 J of kinetic energy and 20 J of potential energy. What is the total energy possessed by the object?

a. 20 J b. 30 J

c. 35 J d. 50 J

e. 70 J

**Question 104:**

aa. An object has 60 J of kinetic energy and 40 J of potential energy. What is the total energy possessed by the object?

a. 20 J b. 40 J

c. 50 J d. 60 J

e. 100 J

**Question 105:**

aa. An object has 25 J of kinetic energy and 15 J of potential energy. What is the total energy possessed by the object?

a. 10 J b. 15 J

c. 20 J d. 25 J

e. 40 J

**Question 106:**

aa. An object has 70 J of kinetic energy and 50 J of potential energy. What is the total energy possessed by the object?

a. 20 J b. 50 J

c. 60 J d. 70 J

e. 120 J

**Question 107:**

aa. An object has 25 J of kinetic energy and 35 J of potential energy. What is the total energy possessed by the object?

a. 10 J b. 25 J

c. 30 J d. 35 J

e. 60 J

**Work Concepts**

**Question 108:**

aa. Which of the following is true of an object whenever work is done on the object?

a. The object moves.

b. The object accelerates.

c. The forces acting upon the object are balanced.

d. The forces acting upon the object are unbalanced.

**Question 109:**

aa. Consider the following statement.

Work is a \_\_\_\_\_\_\_ acting upon an object for a given \_\_\_\_\_\_. The amount of work done is equal to the change in \_\_\_\_\_\_\_\_ of the object.

Which three words accurately complete the sentence in the order listed?

a. force, mass, velocity

b. force, distance, energy

c. force distance, velocity

d. impulse, time, momentum

e. impulse, mass, momentum

**Question 110:**

aa. What does work cause an object to do?

a. Work causes an object to stop.

b. Work causes an object to speed up.

c. Work causes an object to change its energy.

d. Work causes an object to change its speed.

e. Work causes an object to become exhausted.

**Question 111:**

aa. A rightward force acts upon an object that is moving to the right. Such a force does \_\_\_\_\_.

a. positive work

b. negative work

c. no work at all

**Question 112:**

aa. A leftward force acts upon an object that is moving to the right. Such a force does \_\_\_\_\_.

a. positive work

b. negative work

c. no work at all

**Question 113:**

aa. A rightward force acts upon an object that is moving to the left. Such a force does \_\_\_\_\_.

a. positive work

b. negative work

c. no work at all

**Question 114:**

aa. A leftward force acts upon an object that is moving to the left. Such a force does \_\_\_\_\_.

a. positive work

b. negative work

c. no work at all

**Question 115:**

aa. An upward force acts upon an object that is moving to the right. Such a force does \_\_\_\_\_.

a. positive work

b. negative work

c. no work at all

**Question 116:**

aa. A downward force acts upon an object that is moving to the right. Such a force does \_\_\_\_\_.

a. positive work

b. negative work

c. no work at all

**Question 117:**

aa. A rightward force of 4.0 N is exerted upon a 2.0-kg object for a distance of 3.0 meters. What is the work done on the object?

a. 1.5 Joule b. 2.0 Joule

c. 6.0 Joule d. 8.0 Joule

e. 12.0 Joule

**Question 118:**

aa. A rightward force of 5.0 N is exerted upon a 4.0-kg object for a distance of 2.0 meters. What is the work done on the object?

a. 1.25 Joule b. 2.0 Joule

c. 8.0 Joule d. 10.0 Joule

e. 20.0 Joule

**Question 119:**

aa. A rightward force of 6.0 N is exerted upon a 2.0-kg object for a distance of 3.0 meters. What is the work done on the object?

a. 1.5 Joule b. 2.0 Joule

c. 6.0 Joule d. 12.0 Joule

e. 18.0 Joule

**Power Concepts**

**Question 120:**

aa. A powerful machine is a machine that \_\_\_\_\_.

a. uses a lot of energy

b. can do a lot of work

c. has a long battery life

d. can do work very quickly

**Question 121:**

aa. The rate at which work is done is referred to as \_\_\_\_\_.

a. energy b. potential energy

c. momentum d. power

e. efficiency

**Question 122:**

aa. Machine A and Machine B are doing the same task. Machine A does it in 10 seconds and Machine B does in in 20 seconds. Which statement accurately compares Machine A and Machine B?

a. Machine A is twice as powerful as Machine B.

b. Machine B is twice as powerful as Machine A.

c. It is impossible to compare the power of the two machines based on this information.

**Question 123:**

aa. Machine A and Machine B are doing the same task. Machine A does it in 10 seconds and Machine B does in in 20 seconds. This is evidence that Machine A does \_\_\_\_ work as Machine B and has \_\_\_\_\_ the power of Machine B

a. the same, twice b. the same, one-half

c. twice as much, one-half d. twice as much, twice the

e. one-half as much, the same

**Category 2: Energy Conservation and Transformation**

**Question 124:**

aa. Which one of the statements is ALWAYS true of an object that conserves its mechanical energy?

a. Neither its kinetic nor its potential energy undergo a change.

b. The sum of its kinetic and potential energy remains constant.

c. Its kinetic energy remains a constant value; its potential energy may or may not change.

d. Its potential energy remains a constant value; its kinetic energy may or may not change.

**Question 125:**

aa. An object conserves its energy as it moves along a given path. What observation will be made of such an object?

a. It’s kinetic energy does not change.

b. Its potential energy does not change.

c. The total amount of energy does not change.

d. Neither the potential, the kinetic, nor the total energy changes.

**Question 126:**

aa. A child is sledding along a path with several small dips and hills. The child is observed to conserve its energy. Which of the following statements is evidence of this fact?

a. The kinetic energy is constant throughout the path.

b. The changes in potential energy are very minimal.

c. Its speed remains very constant along the entire path.

d. He is still moving when he gets to the very bottom of the hill.

e. The sum of the kinetic and potential energies remains a constant value.

**Question 127:**

aa. Which of the following statements is always true of an object that conserves its mechanical energy?

a. The speed of the object remains constant.

b. The kinetic energy of the object undergoes very little change.

c. Over the course of time, the sum of kinetic and potential energy increases and decreases.

d. Gains in kinetic energy are accompanied by equal losses of potential energy (or vice versa).

**Question 128:**

aa. A sledder has 400 J of potential energy and 200 J of kinetic energy at one point on a steep hill. How much kinetic energy will the sledder have at the bottom of the hill?

a. 200 J b. 300 J

c. 400 J c. 600 J

e. 1200 J

**Question 129:**

aa. A sledder has 600 J of potential energy and 200 J of kinetic energy at one point on a steep hill. How much kinetic energy will the sledder have at the bottom of the hill? (Assume negligible air resistance and friction.)

a. 0 J b. 200 J

c. 400 J c. 600 J

e. 800 J

**Question 130:**

aa. A sledder has 800 J of potential energy and 200 J of kinetic energy at one point on a steep hill. How much kinetic energy will the sledder have at the bottom of the hill? (Assume negligible air resistance and friction.)

a. 0 J b. 200 J

c. 600 J c. 800 J

e. 1000 J

**Question 131:**

aa. A sledder has 500 J of potential energy and 250 J of kinetic energy at one point on a steep hill. How much kinetic energy will the sledder have at the bottom of the hill? (Assume negligible air resistance and friction.)

a. 0 J b. 250 J

c. 375 J c. 500 J

e. 750 J

**Question 132:**

aa. A sledder has 700 J of potential energy and 100 J of kinetic energy at one point on a steep hill. How much kinetic energy will the sledder have at the bottom of the hill? (Assume negligible air resistance and friction.)

a. 0 J b. 100 J

c. 600 J c. 700 J

e. 800 J

**Question 133:**

aa. A child is sledding down a hill. The child has 400 J of potential energy and 200 J of kinetic energy at one point on the hill. How much more kinetic energy does the child gain for the remainder of the motion to the bottom of the hill?

a. 0 J b. 200 J

c. 300 J c. 400 J

e. 600 J

**Question 134:**

aa. A child is sledding down a hill. The child has 600 J of potential energy and 400 J of kinetic energy at one point on the hill. How much more kinetic energy does the child gain for the remainder of the motion to the bottom of the hill?

a. 0 J b. 200 J

c. 400 J c. 600 J

e. 1000 J

**Question 135:**

aa. A child is sledding down a hill. The child has 200 J of potential energy and 500 J of kinetic energy at one point on the hill. How much more kinetic energy does the child gain for the remainder of the motion to the bottom of the hill?

a. 0 J b. 200 J

c. 300 J c. 500 J

e. 700 J

**Question 136:**

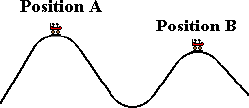
aa. A child is sledding down a hill. The child has 800 J of potential energy and 200 J of kinetic energy at one point on the hill. How much more kinetic energy does the child gain for the remainder of the motion to the bottom of the hill?

a. 0 J b. 200 J

c. 600 J c. 800 J

e. 1000 J

**Question 137:**

aa. A roller coaster car moves along the track from position A to position B as shown. Which of the following statements describe the changes in kinetic energy (KE) and potential energy (PE) observed during this path?

a. The PE decreases and the KE increases.

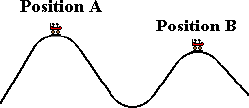
b. The PE increases and the KE decreases.

c. The PE decreases and the KE does not change.

d. The PE increases and the KE does not change.

e. Both increase and decrease but the overall effect is that neither one changes.

**Question 138:**

aa. A roller coaster car moves along the track from position A to position B as shown. Resistance forces have no effect upon the car. Which of the following statements describe the changes in total energy (TE) observed during this path?

a. The TE first decreases and then increases.

b. The TE first increases and then decreases.

c. The TE decreases during the entire motion.

c. The TE increases during the entire motion.

e. There is no change in the TE of the car.

**Question 139:**

aa. An object possesses 45 J of total energy. A force does +25 J of work upon the object. How much energy will the object now possess?

a. 20 J b. 25 J

c. 35 J d. 45 J

e. 70 J

**Question 140:**

aa. An object possesses 45 J of total energy. A force does -25 J of work upon the object. How much energy will the object now possess?

a. 20 J b. 25 J

c. 35 J d. 45 J

e. 70 J

**Question 141:**

aa. An object possesses 50 J of total energy. A force does +20 J of work upon the object. How much energy will the object now possess?

a. 20 J b. 30 J

c. 35 J d. 50 J

e. 70 J

**Question 142:**

aa. An object possesses 50 J of total energy. A force does -20 J of work upon the object. How much energy will the object now possess?

a. 20 J b. 30 J

c. 35 J d. 50 J

e. 70 J

**Question 143:**

aa. An object possesses 55 J of total energy. A force does +25 J of work upon the object. How much energy will the object now possess?

a. 25 J b. 30 J

c. 40 J d. 55 J

e. 80 J

**Question 144:**

aa. An object possesses 55 J of total energy. A force does -25 J of work upon the object. How much energy will the object now possess?

a. 25 J b. 30 J

c. 40 J d. 55 J

e. 80 J

**Question 145:**

aa. An object possesses 40 J of total energy. A force does +10 J of work upon the object. How much energy will the object now possess?

a. 10 J b. 25 J

c. 30 J d. 40 J

e. 50 J

**Question 146:**

aa. An object possesses 40 J of total energy. A force does -10 J of work upon the object. How much energy will the object now possess?

a. 10 J b. 25 J

c. 30 J d. 40 J

e. 50 J

**Question 147:**

aa. An object has 25 J of kinetic energy and 15 J of potential energy. Work is done on the object leaving it with 25 J of kinetic energy and 30 J of potential energy. How much work is done on the object?

a. 15 J b. 20 J

c. 45 J d. 50 J

e. 95 J

**Question 148:**

aa. An object has 15 J of kinetic energy and 25 J of potential energy. Work is done on the object leaving it with 30 J of kinetic energy and 25 J of potential energy. How much work is done on the object?

a. 15 J b. 20 J

c. 45 J d. 50 J

e. 95 J

**Question 149:**

aa. An object has 40 J of kinetic energy and 10 J of potential energy. Work is done on the object leaving it with 40 J of kinetic energy and 30 J of potential energy. How much work is done on the object?

a. 20 J b. 40 J

c. 60 J d. 80 J

e. 120 J

**Question 150:**

aa. An object has 25 J of kinetic energy and 15 J of potential energy. Work is done on the object leaving it with 50 J of kinetic energy and 15 J of potential energy. How much work is done on the object?

a. 10 J b. 25 J

c. 30 J d. 40 J

e. 45 J

**Question 151:**

aa. An object has 20 J of kinetic energy and 30 J of potential energy. Work is done on the object leaving it with 50 J of kinetic energy and 30 J of potential energy. How much work is done on the object?

a. 10 J b. 20 J

c. 30 J d. 35 J

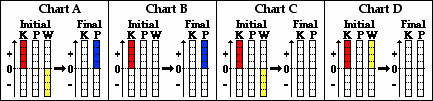
e. 70 J

**Question 152:**

aa. Consider the following situation:

*A baseball player moving with a speed of 8.5 m/s (initial state) dives head-first and slides to a stop (final state) along level ground.*

Which work-energy bar chart below best describes this situation?

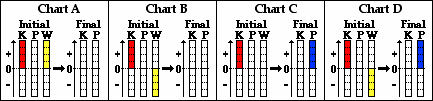


**Question 153:**

aa. Consider the following situation:

*A high-speed car (initial state) is skidding to a stop (final state) along a level roadway.*

Which work-energy bar chart below best describes this situation?

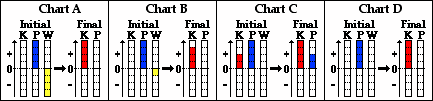


**Question 154:**

aa. Consider the following situation:

*A sledder begins from rest on an incline at a location near the top of a small hill (initial state) and slides effortlessly to ground level at the bottom of the hill (final state). Assume negligible friction and air* resistance.

Which work-energy bar chart below best describes this situation?

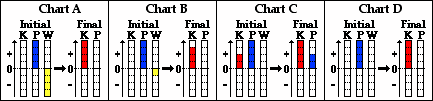


**Question 155:**

aa. Consider the following situation:

*A roller coaster car begins from rest at a location on top of the first drop (initial state) and coasts to the ground level at the bottom of the* *drop (final state). Assume negligible friction and air resistance.*

Which work-energy bar chart below best describes this situation?

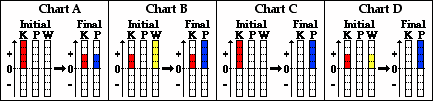
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**Question 156:**

aa. Consider the following situation:

*A skier is pulled by a toe rope from the bottom of a training hill (initial state) to the top of the training hill (final state) at a constant speed.*

Which work-energy bar chart below best describes this situation?

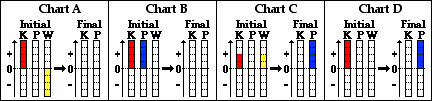


**Question 157:**

aa. Consider the following situation:

*A sledder is moving with a high speed at the bottom of a hill (initial state) and gradually coasts to a stop as it moves up the incline to a location near the top of the hill (final state). Ignore all frictional forces.*

Which work-energy bar chart below best describes this situation?

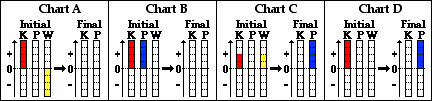


**Question 158:**

aa. Consider the following situation:

*A car is moving with a high speed at the bottom of a hill (initial state) runs out of gas and gradually coasts to a stop as it moves up the incline to a location near the top of the hill (final state). Ignore all frictional forces.*

Which work-energy bar chart below best describes this situation?



**Question 159:**

aa. An object starts at rest from a height of 50 meters. Its total amount of mechanical energy is 500 Joules. The object begins a free-falling motion; there is no air resistance. When it has fallen to a height of 10 meters, its potential energy will be \_\_\_\_ Joules and its total amount of mechanical energy will be \_\_\_\_ Joules. Select the two numbers that fill in the blanks in their respective order.

a. 100, 400 b. 100, 500

c. 400, 100 d. 400, 500

e. 500, 100 ab. 500, 500

**Question 160:**

aa. An object starts at rest from a height of 50 meters. Its total amount of mechanical energy is 500 Joules. The object begins a free-falling motion; there is no air resistance. When it has fallen to a height of 20 meters, its potential energy will be \_\_\_\_ Joules and its total amount of mechanical energy will be \_\_\_\_ Joules. Select the two numbers that fill in the blanks in their respective order.

a. 200, 300 b. 200, 500

c. 300, 200 d. 300, 500

e. 500, 200 ab. 500, 500

**Question 161:**

aa. An object starts at rest from a height of 50 meters. Its total amount of mechanical energy is 500 Joules. The object begins a free-falling motion; there is no air resistance. When it has fallen to a height of 30 meters, its potential energy will be \_\_\_\_ Joules and its total amount of mechanical energy will be \_\_\_\_ Joules. Select the two numbers that fill in the blanks in their respective order.

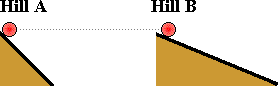
a. 200, 300 b. 200, 500

c. 300, 200 d. 300, 500

e. 500, 300 ab. 500, 500

**Question 162:**

aa. Two objects of identical mass begin from rest at the same height at the top of two different hills - hill A and hill B. The hills are inclined at two different angles (see diagram).



The objects are released from rest and slide to the bottom; resistance forces can be considered to be negligible. From which hill will the ball have the greatest speed at the bottom of the incline?

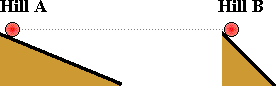
a. Hill A will result in the greatest speed at the bottom.

b. Hill B will result in the greatest speed at the bottom.

c. ... nonsense! The speeds will be the same for each hill.

**Question 163:**

aa. Two objects of identical mass begin from rest at the same height at the top of two different hills - hill A and hill B. The hills are inclined at two different angles.



The objects are released from rest and slide to the bottom; resistance forces can be considered to be negligible. From which hill will the ball have the greatest speed at the bottom of the incline?

a. Hill A will result in the greatest speed at the bottom.

b. Hill B will result in the greatest speed at the bottom.

c. ... nonsense! The speeds will be the same for each hill.