Physics
Common Assessment 6a:
Work and Energy, Form: A

Name: _____
Date: _____
Period: _____

Section 1. Multiple Choice

Choose the best answer to each question.

1. How much work is performed when a 50 kg crate is pushed 15 m with a force of 20 N?
   (a) 300 J
   (b) 750 J
   (c) 1,000 J
   (d) 15,000 J
2. While riding your bicycle, if you double your speed, your kinetic energy will -
   (a) be unchanged
   (b) increase by a factor of 2
   (c) increase by a factor of 4
   (d) increase by a factor of 8
3. Which of the following has a meaning closest to that of potential energy?
   (a) stored energy
   (b) energy at rest
   (c) motion energy
   (d) gravity energy
4. A motor raises a mass of 3.0 kg to a height of 2 meters in 3 seconds. What is the power provided by the motor?
   (a) 0.20 Watts
   (b) 2 Watts
   (c) 18 Watts
   (d) 19.6 Watts
5. A ball falls from a height h from a tower. Which of the following statements is true?
   (a) The potential energy of the ball is constant as it falls.
   (b) The kinetic energy of the ball is constant as it falls.
   (c) The difference between the potential energy and kinetic energy is a constant as the ball falls.
   (d) The sum of the kinetic and potential energies of the ball is a constant as the ball falls.
6. Which of the following would be the best example of kinetic energy being transformed into potential energy?
   (a) A ball rolling up a hill
   (b) dropping a book
   (c) coasting down a hill on a bicycle
   (d) starting an automobile engine

7. Which of the following does **NOT** contribute to the gravitational potential energy of an object?
   (a) Height of the object above the earth's surface.
   (b) The acceleration due to gravity of the earth (g).
   (c) velocity of the object
   (d) mass of the object
8. Which of the following has a meaning closest to that of kinetic energy?
   (a) stored energy
   (b) potential energy
   (c) motion energy
   (d) chemical energy

Section 2. Free Response

9. Calvin and his stuffed tiger, Hobbes, roll down a 45m tall hill in a wagon. The combined mass of Calvin, Hobbes, and the wagon is 35 kg.

   (a) What is the potential energy of the wagon and its passengers at the top of the hill?

   (b) b) What is the final velocity of the wagon at the bottom of the hill? (Assume friction is negligible.)

10. The space probe Deep Space 1, was launched on October 24, 1998. It was the first space probe to use an ion engine, that only generates a weak force of 0.056 N, but requires very little fuel. The probe has a mass of 474 kg. The engine ran for a long time, causing the probe to move a distance of 2 billion meters. Assume that the mass of the probe does not change, and no other forces act on the probe. What is the final speed of the probe?

Answer Key for Exam A

Section 1. Multiple Choice

Choose the best answer to each question.

1. How much work is performed when a 50 kg crate is pushed 15 m with a force of 20 N?

   (a) 300 J
   (b) 750 J
   (c) 1,000 J
   (d) 15,000 J

2. While riding your bicycle, if you double your speed, your kinetic energy will -

   (a) be unchanged
   (b) increase by a factor of 2
   (c) increase by a factor of 4
   (d) increase by a factor of 8

3. Which of the following has a meaning closest to that of potential energy?

   (a) stored energy
   (b) energy at rest
   (c) motion energy
   (d) gravity energy

4. A motor raises a mass of 3.0 kg to a height of 2 meters in 3 seconds. What is the power provided by the motor?

   (a) 0.20 Watts
   (b) 2 Watts
   (c) 18 Watts
   (d) 19.6 Watts

5. A ball falls from a height h from a tower. Which of the following statements is true?

   (a) The potential energy of the ball is constant as it falls.
   (b) The kinetic energy of the ball is constant as it falls.
   (c) The difference between the potential energy and kinetic energy is a constant as the ball falls.
   (d) The sum of the kinetic and potential energies of the ball is a constant as the ball falls.

6. Which of the following would be the best example of kinetic energy being transformed into potential energy?

   (a) A ball rolling up a hill
   (b) dropping a book
   (c) coasting down a hill on a bicycle
   (d) starting an automobile engine

7. Which of the following does **NOT** contribute to the gravitational potential energy of an object?

   (a) Height of the object above the earth's surface.

   (b) The acceleration due to gravity of the earth (g).

   [(c)] velocity of the object

   (d) mass of the object

8. Which of the following has a meaning closest to that of kinetic energy?

   (a) stored energy

   (b) potential energy

   [(c)] motion energy

   (d) chemical energy

Section 2. Free Response

9. Calvin and his stuffed tiger, Hobbes, roll down a 45m tall hill in a wagon. The combined mass of Calvin, Hobbes, and the wagon is 35 kg.

   (a) What is the potential energy of the wagon and its passengers at the top of the hill?

   (b) b) What is the final velocity of the wagon at the bottom of the hill? (Assume friction is negligible.)

10. The space probe Deep Space 1, was launched on October 24, 1998. It was the first space probe to use an ion engine, that only generates a weak force of 0.056 N, but requires very little fuel. The probe has a mass of 474 kg. The engine ran for a long time, causing the probe to move a distance of 2 billion meters. Assume that the mass of the probe does not change, and no other forces act on the probe. What is the final speed of the probe?

Physics
Common Assessment 6a:
Work and Energy, Form: B

Name: _____
Date: _____
Period: _____

Section 1. Multiple Choice

Choose the best answer to each question.

1. Which of the following has a meaning closest to that of kinetic energy?
   (a) stored energy
   (b) potential energy
   (c) motion energy
   (d) chemical energy
2. How much work is performed when a 50 kg crate is pushed 15 m with a force of 20 N?
   (a) 300 J
   (b) 750 J
   (c) 1,000 J
   (d) 15,000 J
3. Which of the following has a meaning closest to that of potential energy?
   (a) stored energy
   (b) energy at rest
   (c) motion energy
   (d) gravity energy
4. Which of the following would be the best example of kinetic energy being transformed into potential energy?
   (a) A ball rolling up a hill
   (b) dropping a book
   (c) coasting down a hill on a bicycle
   (d) starting an automobile engine
5. While riding your bicycle, if you double your speed, your kinetic energy will -
   (a) be unchanged
   (b) increase by a factor of 2
   (c) increase by a factor of 4
   (d) increase by a factor of 8
6. A motor raises a mass of 3.0 kg to a height of 2 meters in 3 seconds. What is the power provided by the motor?
   (a) 0.20 Watts
   (b) 2 Watts
   (c) 18 Watts
   (d) 19.6 Watts

7. Which of the following does **NOT** contribute to the gravitational potential energy of an object?
   (a) Height of the object above the earth's surface.
   (b) The acceleration due to gravity of the earth (g).
   (c) velocity of the object
   (d) mass of the object
8. A ball falls from a height h from a tower. Which of the following statements is true?
   (a) The potential energy of the ball is constant as it falls.
   (b) The kinetic energy of the ball is constant as it falls.
   (c) The difference between the potential energy and kinetic energy is a constant as the ball falls.
   (d) The sum of the kinetic and potential energies of the ball is a constant as the ball falls.

Section 2. Free Response

9. Calvin and his stuffed tiger, Hobbes, roll down a 25m tall hill in a wagon. The combined mass of Calvin, Hobbes, and the wagon is 35 kg.

   (a) What is the potential energy of the wagon and its passengers at the top of the hill?

   (b) b) What is the final velocity of the wagon at the bottom of the hill? (Assume friction is negligible.)

10. The space probe Deep Space 1, was launched on October 24, 1998. It was the first space probe to use an ion engine, that only generates a weak force of 0.056 N, but requires very little fuel. The probe has a mass of 464 kg. The engine ran for a long time, causing the probe to move a distance of 2 billion meters. Assume that the mass of the probe does not change, and no other forces act on the probe. What is the final speed of the probe?

Answer Key for Exam B

Section 1. Multiple Choice

Choose the best answer to each question.

1. Which of the following has a meaning closest to that of kinetic energy?
   (a) stored energy
   (b) potential energy
   (c) motion energy
   (d) chemical energy

2. How much work is performed when a 50 kg crate is pushed 15 m with a force of 20 N?
   (a) 300 J
   (b) 750 J
   (c) 1,000 J
   (d) 15,000 J

3. Which of the following has a meaning closest to that of potential energy?
   (a) stored energy
   (b) energy at rest
   (c) motion energy
   (d) gravity energy

4. Which of the following would be the best example of kinetic energy being transformed into potential energy?
   (a) A ball rolling up a hill
   (b) dropping a book
   (c) coasting down a hill on a bicycle
   (d) starting an automobile engine

5. While riding your bicycle, if you double your speed, your kinetic energy will -
   (a) be unchanged
   (b) increase by a factor of 2
   (c) increase by a factor of 4
   (d) increase by a factor of 8

6. A motor raises a mass of 3.0 kg to a height of 2 meters in 3 seconds. What is the power provided by the motor?
   (a) 0.20 Watts
   (b) 2 Watts
   (c) 18 Watts
   (d) 19.6 Watts

7. Which of the following does **NOT** contribute to the gravitational potential energy of an object?

   (a) Height of the object above the earth's surface.

   (b) The acceleration due to gravity of the earth (g).

   [(c)] velocity of the object

   (d) mass of the object

8. A ball falls from a height h from a tower. Which of the following statements is true?

   (a) The potential energy of the ball is constant as it falls.

   (b) The kinetic energy of the ball is constant as it falls.

   (c) The difference between the potential energy and kinetic energy is a constant as the ball falls.

   [(d)] The sum of the kinetic and potential energies of the ball is a constant as the ball falls.

Section 2. Free Response

9. Calvin and his stuffed tiger, Hobbes, roll down a 25m tall hill in a wagon. The combined mass of Calvin, Hobbes, and the wagon is 35 kg.

   (a) What is the potential energy of the wagon and its passengers at the top of the hill?

   (b) b) What is the final velocity of the wagon at the bottom of the hill? (Assume friction is negligible.)

10. The space probe Deep Space 1, was launched on October 24, 1998. It was the first space probe to use an ion engine, that only generates a weak force of 0.056 N, but requires very little fuel. The probe has a mass of 464 kg. The engine ran for a long time, causing the probe to move a distance of 2 billion meters. Assume that the mass of the probe does not change, and no other forces act on the probe. What is the final speed of the probe?

Physics
Common Assessment 6a:
Work and Energy, Form: C

Name: _____
Date: _____
Period: _____

Section 1. Multiple Choice

Choose the best answer to each question.

1. Which of the following would be the best example of kinetic energy being transformed into potential energy?
   (a) A ball rolling up a hill
   (b) dropping a book
   (c) coasting down a hill on a bicycle
   (d) starting an automobile engine
2. While riding your bicycle, if you double your speed, your kinetic energy will -
   (a) be unchanged
   (b) increase by a factor of 2
   (c) increase by a factor of 4
   (d) increase by a factor of 8
3. Which of the following has a meaning closest to that of kinetic energy?
   (a) stored energy
   (b) potential energy
   (c) motion energy
   (d) chemical energy
4. A motor raises a mass of 3.0 kg to a height of 2 meters in 3 seconds. What is the power provided by the motor?
   (a) 0.20 Watts
   (b) 2 Watts
   (c) 18 Watts
   (d) 19.6 Watts
5. A ball falls from a height h from a tower. Which of the following statements is true?
   (a) The potential energy of the ball is constant as it falls.
   (b) The kinetic energy of the ball is constant as it falls.
   (c) The difference between the potential energy and kinetic energy is a constant as the ball falls.
   (d) The sum of the kinetic and potential energies of the ball is a constant as the ball falls.
6. Which of the following has a meaning closest to that of potential energy?
   (a) stored energy
   (b) energy at rest
   (c) motion energy
   (d) gravity energy

7. How much work is performed when a 50 kg crate is pushed 15 m with a force of 20 N?
   (a) 300 J
   (b) 750 J
   (c) 1,000 J
   (d) 15,000 J
8. Which of the following does **NOT** contribute to the gravitational potential energy of an object?
   (a) Height of the object above the earth's surface.
   (b) The acceleration due to gravity of the earth (g).
   (c) velocity of the object
   (d) mass of the object

Section 2. Free Response

9. Calvin and his stuffed tiger, Hobbes, roll down a 65m tall hill in a wagon. The combined mass of Calvin, Hobbes, and the wagon is 35 kg.

   (a) What is the potential energy of the wagon and its passengers at the top of the hill?

   (b) b) What is the final velocity of the wagon at the bottom of the hill? (Assume friction is negligible.)

10. The space probe Deep Space 1, was launched on October 24, 1998. It was the first space probe to use an ion engine, that only generates a weak force of 0.056 N, but requires very little fuel. The probe has a mass of 484kg. The engine ran for a long time, causing the probe to move a distance of 2 billion meters. Assume that the mass of the probe does not change, and no other forces act on the probe. What is the final speed of the probe?

Answer Key for Exam C

Section 1. Multiple Choice

Choose the best answer to each question.

1. Which of the following would be the best example of kinetic energy being transformed into potential energy?
   - [(a)] A ball rolling up a hill
   - (b) dropping a book
   - (c) coasting down a hill on a bicycle
   - (d) starting an automobile engine

2. While riding your bicycle, if you double your speed, your kinetic energy will -
   - (a) be unchanged
   - (b) increase by a factor of 2
   - [(c)] increase by a factor of 4
   - (d) increase by a factor of 8

3. Which of the following has a meaning closest to that of kinetic energy?
   - (a) stored energy
   - (b) potential energy
   - [(c)] motion energy
   - (d) chemical energy

4. A motor raises a mass of 3.0 kg to a height of 2 meters in 3 seconds. What is the power provided by the motor?
   - (a) 0.20 Watts
   - (b) 2 Watts
   - (c) 18 Watts
   - [(d)] 19.6 Watts

5. A ball falls from a height h from a tower. Which of the following statements is true?
   - (a) The potential energy of the ball is constant as it falls.
   - (b) The kinetic energy of the ball is constant as it falls.
   - (c) The difference between the potential energy and kinetic energy is a constant as the ball falls.
   - [(d)] The sum of the kinetic and potential energies of the ball is a constant as the ball falls.

6. Which of the following has a meaning closest to that of potential energy?
   - [(a)] stored energy
   - (b) energy at rest
   - (c) motion energy
   - (d) gravity energy

7. How much work is performed when a 50 kg crate is pushed 15 m with a force of 20 N?

   [(a)] 300 J
   (b) 750 J
   (c) 1,000 J
   (d) 15,000 J

8. Which of the following does **NOT** contribute to the gravitational potential energy of an object?

   (a) Height of the object above the earth's surface.
   (b) The acceleration due to gravity of the earth (g).
   [(c)] velocity of the object
   (d) mass of the object

Section 2. Free Response

9. Calvin and his stuffed tiger, Hobbes, roll down a 65m tall hill in a wagon. The combined mass of Calvin, Hobbes, and the wagon is 35 kg.

   (a) What is the potential energy of the wagon and its passengers at the top of the hill?

   (b) b) What is the final velocity of the wagon at the bottom of the hill? (Assume friction is negligible.)

10. The space probe Deep Space 1, was launched on October 24, 1998. It was the first space probe to use an ion engine, that only generates a weak force of 0.056 N, but requires very little fuel. The probe has a mass of 484kg. The engine ran for a long time, causing the probe to move a distance of 2 billion meters. Assume that the mass of the probe does not change, and no other forces act on the probe. What is the final speed of the probe?

Physics
Common Assessment 6a:
Work and Energy, Form: D

Name: _____
Date: _____
Period: _____

Section 1. Multiple Choice

Choose the best answer to each question.

1. Which of the following does **NOT** contribute to the gravitational potential energy of an object?
   (a) Height of the object above the earth's surface.
   (b) The acceleration due to gravity of the earth (g).
   (c) velocity of the object
   (d) mass of the object
2. Which of the following would be the best example of kinetic energy being transformed into potential energy?
   (a) A ball rolling up a hill
   (b) dropping a book
   (c) coasting down a hill on a bicycle
   (d) starting an automobile engine
3. A motor raises a mass of 3.0 kg to a height of 2 meters in 3 seconds. What is the power provided by the motor?
   (a) 0.20 Watts
   (b) 2 Watts
   (c) 18 Watts
   (d) 19.6 Watts
4. How much work is performed when a 50 kg crate is pushed 15 m with a force of 20 N?
   (a) 300 J
   (b) 750 J
   (c) 1,000 J
   (d) 15,000 J
5. While riding your bicycle, if you double your speed, your kinetic energy will -
   (a) be unchanged
   (b) increase by a factor of 2
   (c) increase by a factor of 4
   (d) increase by a factor of 8
6. Which of the following has a meaning closest to that of potential energy?
   (a) stored energy
   (b) energy at rest
   (c) motion energy
   (d) gravity energy

7. Which of the following has a meaning closest to that of kinetic energy?
   (a) stored energy
   (b) potential energy
   (c) motion energy
   (d) chemical energy
8. A ball falls from a height h from a tower. Which of the following statements is true?
   (a) The potential energy of the ball is constant as it falls.
   (b) The kinetic energy of the ball is constant as it falls.
   (c) The difference between the potential energy and kinetic energy is a constant as the ball falls.
   (d) The sum of the kinetic and potential energies of the ball is a constant as the ball falls.

Section 2. Free Response

9. Calvin and his stuffed tiger, Hobbes, roll down a 75m tall hill in a wagon. The combined mass of Calvin, Hobbes, and the wagon is 35 kg.

   (a) What is the potential energy of the wagon and its passengers at the top of the hill?

   (b) b) What is the final velocity of the wagon at the bottom of the hill? (Assume friction is negligible.)

10. The space probe Deep Space 1, was launched on October 24, 1998. It was the first space probe to use an ion engine, that only generates a weak force of 0.056 N, but requires very little fuel. The probe has a mass of 494kg. The engine ran for a long time, causing the probe to move a distance of 2 billion meters. Assume that the mass of the probe does not change, and no other forces act on the probe. What is the final speed of the probe?

Answer Key for Exam D

Section 1. Multiple Choice

Choose the best answer to each question.

1. Which of the following does **NOT** contribute to the gravitational potential energy of an object?
   (a) Height of the object above the earth's surface.
   (b) The acceleration due to gravity of the earth (g).
   [(c)] velocity of the object
   (d) mass of the object

2. Which of the following would be the best example of kinetic energy being transformed into potential energy?
   [(a)] A ball rolling up a hill
   (b) dropping a book
   (c) coasting down a hill on a bicycle
   (d) starting an automobile engine

3. A motor raises a mass of 3.0 kg to a height of 2 meters in 3 seconds. What is the power provided by the motor?
   (a) 0.20 Watts
   (b) 2 Watts
   (c) 18 Watts
   [(d)] 19.6 Watts

4. How much work is performed when a 50 kg crate is pushed 15 m with a force of 20 N?
   [(a)] 300 J
   (b) 750 J
   (c) 1,000 J
   (d) 15,000 J

5. While riding your bicycle, if you double your speed, your kinetic energy will -
   (a) be unchanged
   (b) increase by a factor of 2
   [(c)] increase by a factor of 4
   (d) increase by a factor of 8

6. Which of the following has a meaning closest to that of potential energy?
   [(a)] stored energy
   (b) energy at rest
   (c) motion energy
   (d) gravity energy

7. Which of the following has a meaning closest to that of kinetic energy?

   (a) stored energy

   (b) potential energy

   [(c)] motion energy

   (d) chemical energy

8. A ball falls from a height h from a tower. Which of the following statements is true?

   (a) The potential energy of the ball is constant as it falls.

   (b) The kinetic energy of the ball is constant as it falls.

   (c) The difference between the potential energy and kinetic energy is a constant as the ball falls.

   [(d)] The sum of the kinetic and potential energies of the ball is a constant as the ball falls.

Section 2. Free Response

9. Calvin and his stuffed tiger, Hobbes, roll down a 75m tall hill in a wagon. The combined mass of Calvin, Hobbes, and the wagon is 35 kg.

   (a) What is the potential energy of the wagon and its passengers at the top of the hill?

   (b) b) What is the final velocity of the wagon at the bottom of the hill? (Assume friction is negligible.)

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