Energy, Work and Power Quiz - Test Review

ⓘ This is a preview of the published version of the quiz

Started: Jan 24 at 8:45am

Quiz Instructions

g = 10 m/s/s

*The first four quiz questions reset after each attempt. The numbers will change, so complete all the questions before submitting.

Question 1 — 1 pts

A car with mass 8.4 kg is at the top of a hill of height 1.5 meters and has initial velocity of 9.7 m/s. If there is no friction, what is the velocity of the car at the bottom of the hill?

g = 10 m/s/s

Report your answer in m/s and to two decimal places.

Question 2 — 1 pts

A car with mass 9 kg is at the top of a hill of height 8 meters and has initial velocity of 58 m/s. If the velocity of the car at the bottom of the hill is 5, how many joules of energy became heat?

g = 10 m/s/s

Report your answer in Joules and to two decimal places.

Question 3

1 pts

A car with mass 2 kg is at the bottom of a hill of height 2 meters and has initial velocity of 69 m/s. If there is no friction, what is the velocity of the car at the top of the hill?

g = 10 m/s/s

Report your answer in m/s and to two decimal places.

Question 4

1 pts

A car with mass 1 kg is at the bottom of a hill of height 4 meters and has initial velocity of 96 m/s. If there IS friction and the velocity of the car as it reaches the top of the hill is 4 m/s, how much energy was lost as heat at the time it reaches the hill top?

g = 10 m/s/s

Report your answer in Joules and to two decimal places.

Question 5

1 pts

Power is _____ divided by time.

- work
- velocity

- none of these
- force
- displacement

Question 6

1 pts

A student is able to lift a 50 kg mass above to a height of 1 meter in 10 seconds. How much power was generated in Watts?

Question 7

1 pts

A machine runs for 90 seconds with a steady power output of 20 watts. How many joules of work does the machine produce in those 90 seconds?

Question 8

1 pts

A machine runs with a steady power output of 30 Watts producing 150 Joules of work. How long in seconds did the machine run?

Question 9

1 pts

The area under the curve of a force v displacement graph is _____.

- work
- displacement
- force
- time
- none of these
- acceleration
- power
- velocity

Question 10

1 pts

The slope of a work v time graph is _____.

- force
- none of these
- power
- displacement
- joules
- velocity

Question 11

1 pts

1 Watt is equal to 1 _____ per second.

- Meter

- Radian
- Joule
- Degree
- Newton

Question 12

1 pts

A book moves across a table at a constant velocity of 15 m/s with a constant push force of 6 Newtons. What is the power in Watts generated by the pushing force?

Hint: Power = Force*Velocity

Question 13

1 pts

A book moves across a table at a constant velocity of 15 m/s with a constant push force of 6 Newtons. What is the power in Watts generated by the friction force?

Hint: Power = Force*Velocity

Question 14

1 pts

For an object in free fall, the shape of the kinetic energy v. time graph is _____.

- an upward sloping line
- an inverted parabola

- a horizontal line
- a downward sloping line
- a parabola

Question 15

1 pts

For an object in free fall, the shape of the gravitational potential energy v. time graph is _____.

- a downward sloping line
- a horizontal line
- an inverted parabola
- an upward sloping line
- a parabola

Question 16

1 pts

For an object in free fall, the shape of the total mechanical energy v. time graph is _____.

- an inverted parabola
- a parabola
- a downward sloping line
- an upward sloping line
- a horizontal line

Question 17

1 pts

The shape of the 'elastic energy' v. 'change in length' graph for a spring that is being elongated is a _____.

- a downward sloping line
- a parabola
- an inverted parabola
- an upward sloping line

Question 18

1 pts

For an ideal pendulum, the shape of the total mechanical energy v. time graph is a _____.

- a parabola
- a downward sloping line
- an upward sloping line
- an inverted parabola
- a horizontal line

Question 19

1 pts

A crate is pushed at a constant speed across the floor. What is the shape of its 'total mechanical energy' v. time graph?

- an inverted parabola
- a horizontal line
- a parabola
- an upward sloping line

- a downward sloping line

Question 20

1 pts

What is the graph shape for kinetic energy as a function of velocity?

- an upward sloping line
- a downward sloping line
- an inverted parabola
- a horizontal line
- a parabola

Question 21

1 pts

If a spring is initially stretched to a displacement of X m and is later stretched to 3X m, by what factor does the elastic energy in the spring change?

- 3
- 1/9
- 1/3
- 9
- 1/2
- 2

Question 22

1 pts

If the velocity of a moving car quadruples, by what factor does its kinetic energy change?

- 2
- 1/3
- 1/2
- 1/16
- 3
- 4
- 1/4
- 16

Question 23

1 pts

For an ideal pendulum, the kinetic energy is the least when _____.

- it is at the bottom of its swing
- it is at the top of its swing

Question 24

1 pts

What is weight in Newtons of a hanging mass that stretches a spring with k=300 N/m a distance .4 m?

Question 25

1 pts

What is the gravitation potential energy in Joules of a mass with weight 30 N if it is lifted 5 meters off the ground vertically?

Question 26

1 pts

What is the spring constant of a spring that is compressed .5 m with 12 Joules of energy?

Question 27

1 pts

By what factor is power output affected if the time to complete the same work is cut by 1/3?

- 1/9
- 16
- 4
- 3
- 1/4
- 1/3
- 1/16
- 9

Question 28

1 pts

A student pushes a cart 4 meters with a force of 40 N toward the east and then pushes the same cart 5 meters with 60 N toward the north. What is the total amount of work in Joules done by the student on the cart?

Hint: Work is a scalar quantity.

Question 29

1 pts

A 30 Newtons block is at rest at the bottom of a ramp with hypotenuse length 10 m. The vertical displacement of the ramp is 6 meters and the horizontal displacement is 8 meters. How much work in Joules must be done against gravity to move the block to the top of the incline?

Question 30

1 pts

A 30 Newtons block is at rest at the bottom of a ramp with hypotenuse length 10 m. The vertical displacement of the ramp is 6 meters and the horizontal displacement is 8 meters. What is the average force in Newtons required to push the block up the hypotenuse of the ramp to the very top? Assume no friction.

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