

Name:

KEY

Date:

Period:

Energy Practice Test

$$W = \int F \cdot dr \quad KE = \frac{1}{2}mv^2 \quad PE_g = mgh \quad W_{\text{net}} = \Delta KE \quad P = dW/dt$$

$$MA = F_{\text{out}}/F_{\text{in}} (= L_{\text{in}}/L_{\text{out}}) (= L/h) (= n) (= d_{\text{in}}/d_{\text{out}}) \quad \text{eff.} = W_{\text{out}}/W_{\text{in}} \quad E = mc^2 \quad c = 3.00 \times 10^8 \text{ m/s}$$

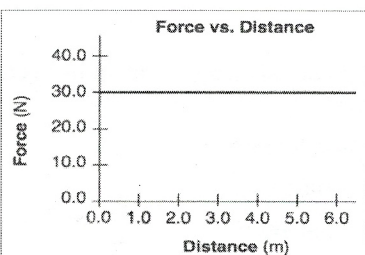
Circle the *most* correct answer to the questions below.

- Which combination of fundamental units can be used to express energy?
 - kg•m/s
 - kg•m²/s
 - kg•m/s²
 - kg•m²/s²
- A student does 60 J of work pushing a 3 kg box up a 5-m-long ramp. What is the force?
 - 20 N
 - 15 N
 - 12 N
 - 4 N
- How much work must be done to accelerate a 15 kg mass from 7.5 m/s to 11.5 m/s?
 - 120 J
 - 422 J
 - 570 J
 - 992 J
- A 75 kg bicyclist coasts at 12 m/s. What's his kinetic energy?
 - 5400 J
 - 900 J
 - 450 J
 - 11,000 J
- The potential energy of an object is dependent on that object's _____.
 - acceleration
 - position
 - momentum
 - speed
- A 60-kg student climbs a 4 m ladder in 8 s. How much work does she do against gravity?
 - 2400 J
 - 290 J
 - 240 J
 - 30 J
- A 900 N boat needs 600 N of force to move it at 15 m/s. The engine provides energy at a rate of
 - 0.024 J
 - 40 W
 - 7500 J
 - 9000 W
- What max work can a 6000-watt motor do in 10 s?
 - 60 J
 - 600 J
 - 6000 J
 - 60,000 J
- A child sliding down a slide goes from rest to 7 m/s. What is the vertical height of the slide?
 - 0.71 m
 - 1.4 m
 - 2.5 m
 - 3.5 m

10. As a ball falls freely toward the ground, its total mechanical energy _____
- A. increases
 - B. decreases
 - C. stays the same

11. According to the graph, how much work is needed to move the object 4 m?

- A. 120 J
- B. 7.5 J
- C. 5 J
- D. 180 J



12. A 1-kg rock is dropped off a 90-m-tall cliff. After falling 20 m, the rock's kinetic energy is

- A. 20 J
- B. 200 J
- C. 700 J
- D. 900 J

13. If the speed of a car doubles, its kinetic energy _____

- A. quarters
- B. halves
- C. doubles
- D. quadruples

14. While riding a ski lift, a 55-kg skier rises 370 m upward. What is the skier's change in *PE*?

- A. 54 J
- B. 540 J
- C. 20,000 J
- D. 200,000 J

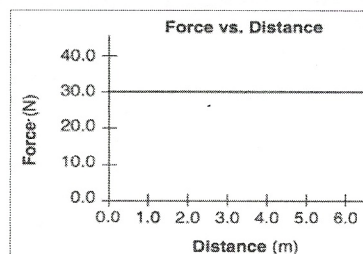
15. A single peanut has a mass energy of 90 trillion joules. What's its mass in kilograms?

- A. 90 trillion kilograms
- B. 300,000 kilograms
- C. 0.001 kilograms
- D. 0.01 kilograms

16. An electric motor lifts a 0.5 kg mass 1.5 m in 5 s. What power is developed by the motor?

- A. 0.15 W
- B. 1.5 W
- C. 3.8 W
- D. 7.5 W

17. If the graph represents net force vs. distance, what must be true of the object's energy?



- A. gravitational potential energy increases
- B. gravitational potential energy decreases
- C. kinetic energy increases
- D. kinetic energy decreases

18. What happens to the total energy of a moving object if no friction acts on it?

- A. increases
- B. decreases
- C. stays the same
- D. not enough info

19. A ball is thrown at 3.5 m/s straight up in the air. In the absence of air resistance, how high will it go?

- A. 0.63 m
- B. 0.18 m
- C. 17 m
- D. 60 m

20. A spacecraft orbits Earth in a circle. How much work is done by gravity?

- A. $F_g r$
- B. $-F_g r$
- C. $\frac{1}{2} mv^2$
- D. zero