

Physics
Chapters 6-7 Practice Test

1. A bullet is fired from a gun. The speed of the bullet will be about the same as the speed of the recoiling gun
 - a. because velocity is conserved.
 - b. because both velocity and momentum are conserved.
 - c. because momentum is conserved.
 - d. if the mass of the bullet equals the mass of the gun.
 - e. none of these
2. The impulse-momentum relationship is a direct result of
 - a. Newton's 2nd law.
 - b. Newton's 4th law.
 - c. Newton's 1st law.
 - d. Newton's 3rd law.
3. The force that accelerates a rocket in outer space is exerted on the rocket by the
 - a. rocket's nose cone.
 - b. exhaust gases.
 - c. rocket's wings.
 - d. atmospheric pressure.
 - e. none of these
4. A karate expert executes a swift blow and breaks a cement block with her bare hand. The magnitude of the force experienced by her hand is
 - a. zero.
 - b. less than the force applied to the cement block.
 - c. more than the force applied to the block.
 - d. identical to the force applied to the block.
5. In order to catch a ball, a baseball player extends the hand forward before impact with the ball and then lets it ride backward in the direction of the ball's motion .. Doing this reduces the force of impact on the player's hand principally because the
 - a. relative velocity is less.
 - b. time of impact is increased.
 - c. time of impact is decreased.
 - d. force of impact is reduced.
6. If you push for a half hour or a whole hour against a stationary wall,
 - a. no work is done in either case.
 - b. twice as much work is done during the half hour.
 - c. half as much work is done during the half hour.
 - d. it is impossible to determine how much work is done.
7. A job is done slowly, while an identical job is done quickly. Both jobs require the same amount of work, but different amounts of
 - a. effort.
 - b. energy.
 - c. power.
 - d. none of these
8. Do 100 J of work in 50 s and your power output is
 - a. 2 W.
 - b. 4 W.
 - c. 5000 W.
 - d. 1/2 W
9. If an object is raised twice as high, its potential energy will be
 - a. twice as much.
 - b. half as much
 - c. four times as much.
10. An object that has kinetic energy must be
 - a. at an elevated position.
 - b. falling.
 - c. moving.
 - d. at rest.
11. The ball rolling down an incline has its maximum potential energy at
 - a. a quarter of the way down.
 - b. the bottom.
 - c. the top.
 - d. halfway down.
12. A ball rolling down an incline has its minimum speed
 - a. at the end the incline.
 - b. near the top of the incline.
 - c. half way down the incline.

$$\text{Momentum} = mv$$

13. What is the momentum of a ball with a mass of 12 kg and a velocity of 3.5 m/s?

$$\text{Impulse} = \Delta mv$$
$$\text{Impulse} = Ft$$

14. What impulse occurs when when an average force of 15 N is exerted on a cart for 3.0 seconds?

$$\text{Work} = \text{force} \times \text{distance} (W = Fd)$$

15. How much work is done when a 20 N force pushes a wagon 6 m?

$$\text{Power} = \text{Work}/\text{time} (P = \frac{W}{t})$$

16. How much power is used when a 50 N force moves a chest of drawers 10 meters in 8 s?

$$\text{Gravitational Potential Energy} = \text{weight} \times \text{height}$$

or

$$PE = mgh$$

17. What is the increase in potential energy when a 40 kg block of ice is lifted up 2 meters.

$$\text{Kinetic Energy} = \frac{1}{2}mv^2$$

18. How much kinetic energy does a 2 kg rock have when tossed across a field at a speed of 5 m/s?

$$\text{Work} \sim \text{Energy Theorem: } \text{Work} = \Delta KE$$

19. Determine the change in kinetic energy an airplane experiences on takeoff if it is moved a distance of 250 m by a sustained force of 10^4 N.

$$\text{Kinetic Energy} = \frac{1}{2}mv^2$$

20. Calculate the kinetic energy of an 8-kg cart that moves at a speed of 5 m/s.
21. Calculate the kinetic energy of a 2500-kg car that moves at a speed of 10 m/s.

$$\text{Total Energy} = KE + PE$$

22. A 30 kg object is dropped from a cliff that is 6 m above a stream. Determine its potential energy before it is dropped. What is its kinetic energy when its potential energy is reduced to 500 J?

$$mv_{\text{before}} = mv_{\text{after}}$$

23. A 1-kg chunk of putty moving at 1 m/s collides with and sticks to a 5-kg bowling ball that is initially at rest on a frictionless surface. The speed of the putty after the collision is
24. A 5000-kg freight car moving at 2 m/s runs into a 10,000-kg freight car at rest. They couple upon collision and move away as one body. What type of collision is this? What is their final velocity?
25. Consider massive gliders that slide friction-free along a horizontal air track. Glider A has a mass of 1 kg, a speed of 1 m/s, and collides with Glider B that has a mass of 5 kg and is at rest. If they stick upon collision, what is their speed after the collision?

Answer Key

Testname: PRACTICE6-7

1. d
2. a
3. b
4. d
5. b
6. a
7. c
8. a
9. a
10. c
11. c
12. b
13. 42 kg-m/s
- 14.
15. 120 J
16. 62.5 Watts
17. 800 J
18. 25 J
19. 2 500 000 J or 2.5×10^6 J
20. 100 J
- 21.
22. 3100 J
23. $\frac{1}{6}$ m/s or 0.16 m/s
24. 2 m/s.
25. $\frac{1}{6}$ m/s.