

4. Whirl a rock at the end of a string and it follows a circular path. If the string breaks, the tendency of the rock is to
- (1) follow a straight-line path.
 - (2) increase its speed
 - (3) continue to follow a circular path.
 - (4) revolve in a smaller circle
 - (5) —
5. While an object near the earth's surface is in free fall , its
- (1) velocity increases.
 - (2) acceleration increases.
 - (3) mass increases.
 - (4) mass decreases.
 - (5) —
6. If an object falling freely were somehow equipped with an odometer to measure the distance it travels, then the amount of distance it travels each succeeding second would be
- (1) greater than the second before.
 - (2) constant.
 - (3) doubled.
 - (4) less and less each second.
 - (5) —
7. If a rocket initially at rest accelerates at a rate of 50 m/s^2 for one minute, its speed will be
- (1) 3000 m/s.
 - (2) 500 m/s.
 - (3) 50 m/s.
 - (4) 3600 m/s.
 - (5) —
8. An object falls freely from rest on a planet where the acceleration due to gravity is 20 meters per second squared. After 5 seconds, the object will have a speed of
- (1) 100 m/s.
 - (2) 20 m/s.
 - (3) 50 m/s.
 - (4) 10 m/s.
 - (5) 5 m/s.
9. Consider drops of water that leak at a steady rate from a dripping faucet. As the drops fall they
- (1) get farther apart.
 - (2) remain at a relatively fixed distance from one another.
 - (3) get closer together.
 - (4) —
 - (5) —
10. The muzzle velocity of a bullet fired from a new rifle is 100 m/s. Neglecting air resistance, at the end of one second a bullet fired straight up into the air will have traveled a distance of
- (1) $(100 - 4.9) \text{ m}$.
 - (2) $(100 + 4.9) \text{ m}$.
 - (3) 4.9 m.
 - (4) 100 m.
 - (5) none of these
11. A man leans over the edge of a cliff and throws a rock upward at 4.9 m/s. Neglecting air resistance, one second later the rock's speed is
- (1) 4.9 m/s.
 - (2) 14.7 m/s.
 - (3) zero.
 - (4) 9.8 m/s.
 - (5) none of these.
12. A ride on a roller-coaster car containing 6 passengers takes 3 minutes. Neglecting friction, a similar ride with 12 passengers aboard would take
- (1) 3 minutes.
 - (2) 18 minutes.
 - (3) 6 minutes.
 - (4) 1.5 minutes.
 - (5) —
13. A 10-N falling object encounters 4 N of air resistance. The net force on the object is
- (1) 6 N.
 - (2) 4 N.
 - (3) 0 N.
 - (4) 10 N.
 - (5) 16 N

14. Which has zero acceleration? An object
- (1) all of these (2) at rest. (3) moving at constant velocity. (4) in mechanical equilibrium. (5) none of these
15. A bag of groceries has a mass of 10 kilograms and a weight of
- (1) about 100 N. (2) about 1000 N. (3) about 10 N. (4) about 1 N. (5) more than 1000 N.
16. A rock is thrown vertically into the air. At the very top of its trajectory the net force on it is
- (1) almost equal to its weight. (2) more than its weight. (3) less than its weight. (4) — (5) —
17. A skydiver of mass 100 kg experiences air resistance of 500 N, and an acceleration of
- (1) about 0.5 g. (2) about 0.2 g. (3) about 0.3 g. (4) about 0.4 g. (5) more than 0.5 g.
18. A person is attracted toward the center of the Earth by a 500-N gravitational force. The Earth is attracted toward the person with a force of
- (1) 500 N. (2) 250 N. (3) 1000 N. (4) zero. (5) —
19. A automobile and a baby carriage traveling at the same speed collide head-on. The impact force is
- (1) the same for both. (2) greater on the automobile. (3) greater on the baby carriage. (4) — (5) —
20. It is correct to say that impulse is equal to
- (1) the change in momentum.
(2) the force multiplied by the distance the force acts.
(3) momentum.
(4) velocity multiplied by time
(5) —
21. When you jump from an elevated position you usually bend your knees upon reaching the ground. By doing this, you make the time of the impact about 10 times as great as for a stiff-legged landing. In this way the average force your body experiences is
- (1) about 1/10 as great.
(2) less than 1/10 as great.
(3) more than 1/10 as great.
(4) about 10 times as great.
(5) —
22. A 1-kg chunk of putty moving at 1 m/s collides with and sticks to a 5-kg bowling ball initially at rest. The bowling ball and putty then move with a momentum of
- (1) 1 kg m/s. (2) 0 kg m/s. (3) 5 kg m/s. (4) 2 kg m/s. (5) more than 5 kg m/s.
23. A 2-kg mass is held 4 m above the ground. What is the approximate potential energy of the mass with respect to the ground?
- (1) 80 J (2) 32 J (3) 8 J (4) 6 J (5) none of these

24. A pulley system raises a 1000-N load 2 meters with 100 N of input force. The efficiency of the system is

- (1) Not enough information is given. (2) 100%. (3) 90%. (4) 10%. (5) —

25. When a rifle is fired it recoils as the bullet is set in motion. The rifle and bullet ideally acquire equal

- (1) but opposite amounts of momentum. (2) amounts of kinetic energy. (3) both of these (4) neither of these (5) —