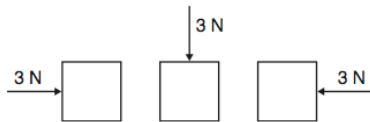


Forces:

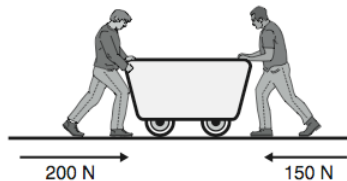
1. A force is acting on each of the objects below.



What can be concluded about these forces?

- a. They are the same because they point toward the objects.
- b. They are the same because they have the same magnitude.
- c. They are different because they have different magnitudes.
- d. They are different because they have different directions.**

2. Two students are pushing a cart, as shown below.

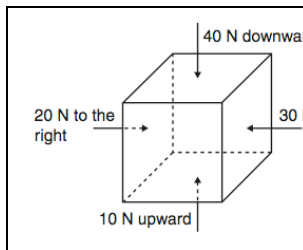


The cart will move as if it were acted on by a single force with

- a. **50 N.**
- b. 150 N.
- c. 200 N.
- d. 350 N.

3. A ball is dropped from the top of a tall building. As the ball falls, the upward force of air resistance becomes equal to the downward pull of gravity. When these two forces become equal in magnitude, the ball will

- a. flatten due to the forces.
- b. fall at a constant speed.**
- c. continue to speed up
- d. slow to a stop.



4. Four forces are acting on a box, as shown below. This box will increase in speed

- a. downward and to the left.**
- b. downward and to the right.
- c. upward and to the left.
- d. upward and to the right.

5. A force of 5 N is required to increase the speed of a box from a rate of 1.0 m/s to 3.0 m/s within 5 s along a level surface. What change would most likely require additional force to produce the same results?

- a. reduce the mass of the box
- b. increase the mass of the box**
- c. make the box surfaces smooth
- d. make the floor surface smooth

6. Which of the following carts will accelerate the least?

- A. an empty cart pushed with a hard force
- B. a full cart pushed with a hard force
- C. an empty cart pushed with a light force
- D. a full cart pushed with a light force**

7. What is the role of gravity in our solar system?

- a. Gravity pushes the planets farther and farther apart.
- b. Gravity pulls planets closer and closer to the sun.
- c. Gravity keeps the planets in orbit around the sun.**
- d. Gravity is created by the sun, which attracts the planets.

8. A teenager pulls a rope to the left with a force of 12 N. A child pulls on the other end of the rope to the right with a force of 7 N. The child's friend adds a force of 8 N, also pulling to the right. What will happen?

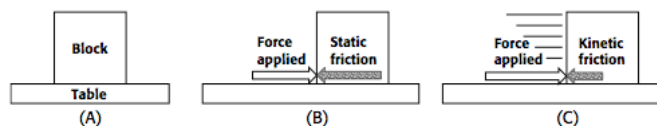
- a. net force = 3 N to the right.**
- b. net force = 15 N to the left.
- c. net force = 12 N to the right.
- d. net force = 27 N to the left.

9. The magnitude of the gravitational force between two bodies depends upon

- a. the velocity of the bodies and the friction between them.
- b. the size of the bodies and their position relative to Earth.
- c. the weight of the bodies and how quickly they are moving.
- d. the mass of the bodies and the distance between them.**

10. What is the best explanation for why this picture is an example of projectile motion?

- a. The runner jumps higher than the hurdle.
- b. The runner has greater horizontal velocity than vertical velocity.
- c. The runner has both horizontal and vertical motion.**
- d. The runner has both vertical motion and gravity.



11. Look at Figure A. Why does the block not move?

- a. because of frictional force
- b. because no forces are applied**
- c. because of kinetic friction
- d. because of surface friction

12. Look at Figure B. What force keeps the block in place?

- a. kinetic friction
- b. force applied
- c. force greater than the force of static friction
- d. static friction**

13. Look at Figure C. The block is moving. What force acts against the movement of the block?

- a. gravity
- b. rolling kinetic friction
- c. sliding kinetic friction**
- d. static friction

14. Which of the following is a force?

- A. inertia
- B. friction**
- C. velocity
- D. acceleration

15. Gravitational force between two objects depends on their ____.

- A. speed
- B. masses**
- C. velocities
- D. shapes

16. ____ acts only between surfaces that are in contact.

- A. Inertia
- B. Friction**
- C. Gravity
- D. A net force

17. Forces equal in size and opposite in direction are called ____.

- A. newtons
- B. balanced forces**
- C. net forces
- D. friction

18. In a head-on car crash, passengers not wearing seat belts continue to move forward with the same ____ that the car had prior to impact.

- A. momentum**
- B. force
- C. potential energy
- D. speed

1 pt each: /18 pts