

Review Question Chapters 6, 7, 8, 9

2)The difference between impulse and impact force involves the

- A)distance the force acts.
- B)time the force acts.
- C)difference between acceleration and velocity.
- D)mass and its effect on resisting a change in momentum.

Answer: B

3)It is correct to say that impulse is equal to

- A)momentum.
- B)the change in momentum.
- C)the force multiplied by the distance the force acts.
- D)velocity multiplied by time

Answer: B

14)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 momentum is conserved.
- B)because velocity is conserved.
- C)because both velocity and momentum are conserved.
- D)if the mass of the bullet equals the mass of the gun.
- E)none of these

Answer: D

Diff: 2

Topic: Momentum

15)Padded dashboards in cars are safer in an accident than nonpadded ones because an occupant hitting the dash has

- A)increased time of impact.
- B)decreased time of impact.
- C)decreased impulse.
- D)increased momentum.

Answer: A

17)Compared to falling on a stone floor, a wine glass may not break when it falls on a carpeted floor because the

- A)carpeted floor provides a smaller impulse.
- B)stopping time is shorter on the carpet.
- C)stopping time is longer on the carpet.
- D)carpet provides a smaller impulse and a longer time.

Answer: B

18)A 4 kg ball has a momentum of 12 kg m/s. What is the ball's speed?

- A)3 m/s
- B)4 m/s
- C)12 m/s
- D)48 m/s

E)none of these

Answer: A

20)Recoil is noticeable if we throw a heavy ball while standing on roller skates. If instead we go through the motions of throwing the ball but hold onto it, our net recoil will be

- A)zero.
- B)the same as before.
- C)small, but noticeable.

Answer: A

21)A heavy truck and a small car rolling down a hill at the same speed are forced to stop in the same amount of time. Compared to the force that stops the car, the force needed to stop the truck is

- A)greater.
- B)smaller.
- C)the same.

Answer: A

27)Two billiard balls having the same mass and speed roll toward each other. What is their combined momentum after they meet ?

- A)0
- B)half the sum of their original momentums.
- C)twice the sum of their original momentums
- D)impossible to determine without additional information

Answer: A

29)A large metal ball is shot from a cannon with a short barrel. If the same ball were to be shot from cannon with a longer barrel, its muzzle velocity would be

- A)less.
- B)more.
- C)the same.
- D)impossible to determine without additional information.

Answer: B

31)A 1000-kg car moving at 10 m/s brakes to a stop in 5 s. The average braking force is

- A)1000 N.
- B)2000 N.
- C)3000 N.
- D)4000 N.
- E)5000 N.

Answer: B

34)A 5-kg fish swimming at a speed of 1 m/s swallows an absent-minded 1-kg fish at rest. The speed of the larger fish after this lunch is

- A)1/2 m/s.
- B)2/5 m/s.
- C)5/6 m/s.
- D)6/5 m/s.
- E)1 m/s.

Answer: C

42)An astronaut , floating alone in outer space, throws a baseball. If the ball floats away at a speed of 20 meters per second, the astronaut will

- A)move in the opposite direction at a speed of 20 m/s.
- B)move in the opposite direction, but at a lower speed.
- C)move in the opposite direction but at a higher speed.
- D)not move as stated in any of the above choices.

Answer: B

45)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, their speed after collision will be

- A)1/4 m/s.
- B)1/5 m/s.
- C)1/6 m/s.
- D)1 m/s.
- E)none of these.

Answer: C

50)A sandbag is motionless in outer space. A second sandbag with 3 times the mass moving at 12 m/s collides with it. They stick together and move at a speed of

- A)3 m/s.
- B)4 m/s.
- C)6 m/s.
- D)8 m/s.
- E)none of these

Answer: E

CHAPTER 7

5)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)energy.
- B)power.
- C)effort.
- D)none of these

Answer: B

10)An object lifted 10 meters gains 200 J of potential energy. If the same object is lifted 20 meters, its potential energy gain is

- A)half as much.
- B)the same.
- C)twice as much.
- D)four times as much.
- E)more than four times as much.

Answer: C

20)After rolling halfway down an incline a marble's kinetic energy is

- A)less than its potential energy.
- B)greater than its potential energy.
- C)the same as its potential energy.
- D)impossible to determine.

Answer: C

44)A car moving at 50 km/hr skids 20 m with locked brakes. How far will the car skid with locked brakes if it were traveling at 150 km/hr?

- A)20 m
- B)60 m
- C)90 m
- D)120 m
- E)180 m

Answer: E

45)Which has greater kinetic energy, a car traveling at 30 km/hr or a car of half the mass traveling at 60 km/hr?

- A)the 30 km/hr car
- B)the 60 km/hr car
- C)Both have the same kinetic energy.
- D)More information is needed about the distance traveled.

Answer: B

51)Which requires the most amount of work by the brakes of a car?

- A)slowing down from 100 km/h to 70 km/h
- B)slowing down from 70 km/h to a stop
- C)equal amounts for either

Answer: A

61)Whereas impulse involves the time that a force acts, work involves the

- A)distance that a force acts.
- B)time and distance that a force acts.
- C)acceleration that a force produces.

Answer: A

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

- A)but opposite amounts of momentum.
- B)amounts of kinetic energy.
- C)both of these
- D)neither of these

Answer: A

64)When an object is in motion, which of the following could not have a value of zero?

- A)momentum
- B)kinetic energy
- C)mass
- D)inertia
- E)None of the above could be zero.

Answer: E

66)If the speed of a moving object doubles, which of the following also doubles?

- A)momentum
- B)kinetic energy
- C)acceleration
- D)all of the above

Answer: A

67)An object at rest may also have

- A)speed.
- B)velocity.
- C)momentum.
- D)kinetic energy.
- E)potential energy.

Answer: E

68)A feather and a coin dropped in a vacuum fall with equal

- A)forces.
- B)momenta.
- C)accelerations.
- D)kinetic energies.
- E)none of these

Answer: C

70)Two pool balls, each moving at 2 m/s, roll toward each other and collide. Suppose after bouncing apart, each moves at 4 m/s. This collision violates conservation of

- A)momentum.
- B)energy.
- C)both momentum and energy.
- D)none of the above choices

Answer: B

71)Compared to the recoiling rifle, the bullet fired has

- A)a greater momentum.
- B)a greater kinetic energy.
- C)a smaller speed.
- D)all of the above

Answer: B

73)An open freight car rolls friction free along a horizontal track in a pouring rain that falls vertically. As water accumulates in the car, the car's speed

- A)increases.
 - B)decreases.
 - C)doesn't change.
 - D)cannot be determined with the information given
- Answer: B

CHAPTER 8

22)The chef at the infamous Fattening Tower of Pizza tosses a spinning disk of uncooked pizza dough into the air. The disk's diameter increases during the flight, while its rotational speed

- A)remains constant.
- B)increases.
- C)decreases.

Answer: C

25)When a twirling ice skater brings her arms inward, her rotational speed

- A)increases.
- B)decreases.
- C)remains the same.

Answer: A

27)A baseball bat is balanced on a fulcrum. The center of gravity of the bat is located

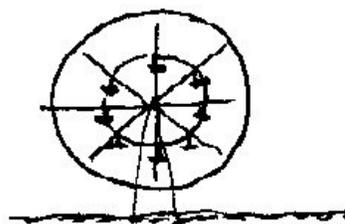
- A)closer to the handgrip.
- B)above the fulcrum.
- C)closer to the heavy end.

Answer: B

30)A phonograph record player has constant rotational speed. The speed of the record surface relative to the pickup needle is greatest

- A)at the end of the record.
- B)at the beginning of the record.
- C)everywhere, because it has the same speed anywhere on the record.

Answer: B



31)A carnival has a Ferris wheel where the seats are located halfway between the center and outside rim. Compared with a Ferris wheel with seats on are on the outside rim, your angular speed while riding on this Ferris wheel would be

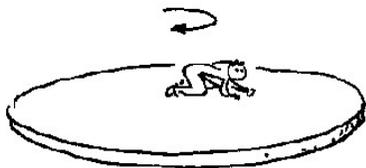
- A)less and your tangential speed more.

- B)more and your tangential speed less.
 C)the same and your tangential speed less.
 Answer: C

- 34)For a system in mechanical equilibrium,
 A)the resultant force must be zero.
 B)the resultant torques must be zero.
 C)the resultant forces and torques must both be zero.
 D)the resultant forces and torques must be equal.
 Answer: C

- 36)Two people are balanced on a see-saw. If one person leans toward the center of the see-saw, that person's end of the see-saw will
 A)rise.
 B)fall.
 C)stay at the same level.
 D)rise and then fall.
 E)fall and then rise.
 Answer: A

- 37)A 1-kg rock is suspended from the tip of a meter stick at the 0- cm mark so that the meter stick balances like a see-saw when the fulcrum is at the 25-cm mark. From this information, what is the mass of the meter stick?
 A)1/4 kg
 B)1/2 kg
 C)3/4 kg
 D)1 kg
 E)more than 1 kg
 Answer: D



- 46)Suppose you are at the center of a large freely-rotating horizontal turntable in a carnival funhouse. As you crawl toward the edge, the angular momentum of you and the turntable
 A)decreases.
 B)increases.
 C)remains the same, but the RPMs decrease.
 D)decreases in direct proportion to your decrease in RPMs.
 E)none of these
 Answer: C

- 49)A small boy places a rock under the middle of a of a long wood plank, sits near one end and his mother sits near the opposite end. To balance each other,
 A)the mother should move further away from the boy.
 B)the boy should move closer to his mother.
 C)both should move closer to the ends of the plank.
 D)both should move closer to the middle of the plank.
 E)None of the above choices would work.
 Answer: E

- 50)Stand a meter stick on its end and let go and it rotates to the floor. If you attach a heavy weight to its upper end and repeat, falling time will be
 A)more.
 B)less.
 C)the same.
 Answer: A

- 54)A ring and a disk, initially at rest, roll down a hill together. The one to reach the bottom first
 A)is the ring.
 B)is the disk.
 C)depends on the masses.
 D)depends on the relative rotational inertias.
 E)Both reach the bottom at the same time.
 Answer: B

- 55)A ring, a disk, and a solid sphere begin rolling down a hill together. The one to reach the bottom first is the
 A)ring.
 B)disk.
 C)sphere.
 D)They all reach the bottom at the same time.
 E)Not enough information is given.
 Answer: C
 Diff: 3

- 57)Neglecting air resistance, which will roll from rest to the bottom of an incline first, an empty jar, or the same jar filled with peanut butter?
 A)the filled jar
 B)the empty jar
 C)Both reach the bottom at the same time.
 D)More information is needed.
 Answer: A