Unit 2 Test

Physics

October 31, 2017

Assume g = 10 m/s2

1) Whenever the net force on an object is zero, its acceleration

A) may be less than zero.

B) is zero.

C) may be more than zero.

2) If an apple experiences a constant net force, it will have a constant

A) velocity.

B) speed.

C) acceleration.

D) position.

E) more than one of the above

3) If the net force on a cart is tripled, the cart's acceleration

A) is one third.

B) is two thirds.

C) is three times as much.

D) is more than three times as much.

4) A mobile phone is pulled northward by a force of 10 N and at the same time pulled southward by another force of 15 N. The resultant force on the phone is

A) 0 N.

B) 5 N.

C) 25 N.

D) 150 N.

5) The force of friction on a sliding object is 10 N. The applied force needed to maintain a constant velocity is

A) more than 10 N.

B) less than 10 N.

C) 10 N.

6) A 300-kg bear grasping a vertical tree slides down at constant velocity. The friction force between the tree and the bear is

A) 30 N.

B) 300 N.

C) 3000 N.

D) more than 3000 N.

7) The newton is a unit of

A) force.

B) mass.

C) density.

D) inertia.

8) A 1-kg mass at the Earth's surface weighs

A) 1 N.

B) 5 N.

C) 10 N.

D) 12 N.

E) none of the above

9) The mass of a lamb that weights 110 N is about

A) 1 kg.

B) 11 kg.

C) 110 kg.

D) 1100 kg.

E) none of the above

10) Strange as it may seem, it is just as difficult to accelerate a car on a level surface on the Moon as it is here on Earth because

A) the mass of the car is independent of gravity.

B) the weight of the car is independent of gravity.

C) both of these

D) neither of these

11) If an object's mass is decreasing while a constant force is applied to the object, the acceleration

A) decreases.

B) increases.

C) remains the same.

12) Which has zero acceleration? An object

A) at rest.

B) moving at constant velocity.

C) in mechanical equilibrium.

D) all of the above

E) none of the above

13) A car by itself is capable of a certain maximum acceleration. When it tows a car of the same mass, its maximum acceleration is

A) one half.

B) one third.

C) one fourth.

D) the same.

E) none of these

14) A heavy block at rest is suspended by a vertical rope. When the block accelerates upward by the rope, the rope tension

A) is less than its weight.

B) equals its weight.

C) is greater than its weight.

15) A car has a mass of 1000 kg and accelerates at 2 m/s2. What net force is exerted on the car?

A) 500 N

B) 1000 N

C) 1500 N

D) 2000 N

E) none of these

16) A tow truck exerts a force of 3000 N on a car, which then accelerates at 2 m/s2. What is the mass of the car?

A) 500 kg

B) 1000 kg

C) 1500 kg

D) 3000 kg

E) none of these

17) Nellie pulls on a 10-kg wagon with a constant horizontal force of 30 N. If there are no other horizontal forces, what is the wagon's acceleration?

A) 0.3 m/s2

B) 3.0 m/s2

C) 10 m/s2

D) 30 m/s2

E) 300 m/s2

18) A boulder following a straight-line path at constant velocity has

A) a net force acting upon it in the direction of motion.

B) zero acceleration.

C) no forces acting on it.

D) none of the above

19) Phil stands at rest with both feet on a scale that reads 500 N. When he gently lifts one foot, the scale reads

A) less than 500 N.

B) 500 N.

C) more than 500 N.

20) A 10-N block and a 1-N block lie on a horizontal frictionless table. To impart equal horizontal accelerations, we would have to push the heavier block with

A) an equal force.

B) 10 times as much force.

C) 10 squared or 100 times as much force.

D) 1/10 as much force.

E) none of the above

21) A rock is thrown vertically into the air. At the top of its path the net force on it is

A) less than *mg*.

B) *mg*.

C) more than *mg*.

22) The brakes of a speeding truck are slammed on and it skids to a stop. If the truck were heavily loaded so that it had twice the total mass, the skidding distance would be

A) half as far.

B) 1.5 times as far.

C) twice as far.

D) 4 times as far.

E) the same.

23) A 10-kilogram block is pushed across a horizontal surface with a horizontal force of 20 N against a friction force of 10 N. The acceleration of the block is

A) 1 m/s2.

B) 2 m/s2.

C) 5 m/s2.

D) 10 m/s2.

E) none of the above

24) An astronaut on another planet drops a 1-kg rock from rest and finds that it falls a vertical distance of 2.5 meters in one second. On this planet, the rock has a weight of

A) 1 N.

B) 2 N.

C) 3 N.

D) 4 N.

E) 5 N.

25) You cannot exert a force on a wall

A) if the wall resists.

B) unless you put your mind to it.

C) unless the wall simultaneously exerts the same amount of force on you.

26) One end of a rope is pulled with 100 N, while the opposite end also is pulled with 100 N. The tension in the rope is

A) 0 N.

B) 50 N.

C) 100 N.

D) 200 N.

27) The winner in a tug-of-war exerts the greatest force on

A) the opponent.

B) his or her end of the rope.

C) the ground.

28) A pair of action-reaction forces always

A) act on the same object.

B) occur simultaneously.

C) comprise a pair of interactions.

D) all of the above

E) none of the above

29) Harry pulls on the end of a spring attached to a wall. The reaction to Harry's pull on the spring is

A) the wall pulling oppositely on the spring.

B) the spring pulling on Harry.

C) both the wall and the spring pulling on Harry.

D) none of the above

30) For every action force, there must be a reaction force that

A) acts in the same direction.

B) is slightly smaller in magnitude than the action force.

C) is slightly larger in magnitude than the action force.

D) is equal in magnitude.

31) When a karate chop breaks a board with a 3000-N blow, the amount of force that acts on the hand is

A) zero.

B) 1500 N.

C) 3000 N.

D) 6000 N.

32) When a baseball player bats a ball with a force of 1000 N, the reaction force that the ball exerts against the bat is

A) less than 1000 N.

B) more than 1000 N.

C) 1000 N.

D) need more information

33) A Mack truck and a Volkswagen traveling at the same speed have a head-on collision. The vehicle that undergoes the greatest change in velocity will be the

A) Volkswagen.

B) Mack truck.

C) same for both.

34) As a ball falls, the action force is the Earth's pull on the ball. The reaction force is the

A) air resistance acting against the ball.

B) acceleration of the ball.

C) ball's pull on Earth.

D) none of the above

35) A pair of toy freight cars, one twice the mass of the other, fly apart when a compressed spring that joins them is released. Acceleration will be greater for the

A) heavier car.

B) lighter car.

C) same on each.