

1. 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
  - a. revolve in a smaller circle.
  - b. follow a straight-line path.
  - c. increase its speed.
  - d. continue to follow a circular path.
  
2. In science, facts
  - a. mean very little.
  - b. are more important than theories.
  - c. are absolute.
  - d. may change.
  
3. While an object near the Earth's surface is in free fall, its
  - a. mass increases.
  - b. velocity increases.
  - c. mass decreases.
  - d. acceleration increases.
  
4. The newton is a unit of
  - a. mass.
  - b. inertia.
  - c. density.
  - d. force.
  
5. If no external forces are acting on a moving object, it will
  - a. move slower and slower until it finally stops.
  - b. continue moving at the same speed.
  - c. continue moving at the same velocity.
  
6. If an object moves with constant acceleration, its velocity must
  - a. change by the same amount each second.
  - b. change by varying amounts depending on its speed.
  - c. always decrease.
  - d. be constant also.
  
7. A rock weighs 30 N on Earth. A second rock weighs 30 N on the moon. Which of the two rocks has the greater mass?
  - a. the one on the moon
  - b. They have the same mass.
  - c. the one on Earth
  - d. not enough information to say

8. Whenever the net force on an object is zero, its acceleration
  - a. may be less than zero.
  - b. may be more than zero
  - c. is zero.
  
9. A force is a vector quantity because it has both
  - a. action and reaction counterparts.
  - b. magnitude and direction.
  - c. mass and acceleration.
  
10. As a ball falls, the action force is the pull of Earth on the ball. The reaction force is the
  - a. air resistance acting against the ball.
  - b. pull of the ball's mass on the Earth.
  - c. acceleration of the ball.
  - d. none of these
  
11. Your friend says that the heavyweight champion of the world cannot exert a force of 50 N on a piece of tissue paper with his best punch. The tissue paper is held in midair – no wall, no tricks. You
  - a. disagree, for a good punch easily delivers this much force.
  - b. agree that it can't be done.
  - c. have reservations about this assertion.
  
12. An object that has kinetic energy must be
  - a. moving.
  - b. at an elevated position.
  - c. at rest.
  - d. falling.
  - e. none of these
  
13. Two objects have the same size and shape, but one is much heavier than the other. When they are dropped simultaneously from a tower, they reach the ground at the same time, but the heavier one has a greater
  - a. momentum.
  - b. speed.
  - c. acceleration.
  - d. all of these
  - e. none of these
  
14. An object may have potential energy because of its
  - a. acceleration.
  - b. momentum.
  - c. location.
  - d. speed.
  - e. none of these

15. The famous Leaning Tower of Pisa doesn't topple over because its center of gravity is
- relatively low for such a tall building.
  - displaced from its center.
  - in the same place as its center of mass.
  - stabilized by its structure.
  - above a place of support.
16. A torque acting on an object tends to produce
- a center of gravity.
  - linear motion.
  - rotation.
  - equilibrium.
  - velocity.
17. The long, heavy tail of a spider monkey enables the monkey to easily vary its
- weight.
  - center of gravity.
  - momentum.
  - inertia.
  - none of these
18. Centrifugal forces are an apparent reality to observers in a reference frame that is
- moving at constant velocity.
  - rotating.
  - an inertial reference frame.
  - at rest.
  - none of these
19. When a twirling ice skater brings her arms inward, her rotational speed
- decreases.
  - increases.
  - remains the same.
20. An object is placed exactly halfway between the Earth and moon. The object will fall toward the
- moon.
  - Earth.
  - neither of these
21. An Earth satellite is simply a projectile
- floating motionless in space near the Earth.
  - freely falling around the Earth.
  - approaching the Earth from outer space.

22. 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?
- the empty jar
  - the filled jar
  - Both reach the bottom at the same time.
  - More information is needed.
23. The reason the moon does not crash into the Earth is that the
- gravitational pull of other planets keeps the moon up.
  - moon has less mass than the Earth.
  - moon has a sufficient tangential speed.
  - Earth's gravitational field is weak at the moon.
  - none of these
24. The factor most directly responsible for making a black hole invisible is its
- size.
  - color.
  - mass.
  - surface escape velocity.
25. According to Kepler's laws, the paths of planets about the sun are
- circles.
  - parabolas.
  - ellipses.
  - straight lines.
  - none of these
26. What makes an element distinct?
- the number of electrons
  - the number of protons
  - the number of neutrons
  - the total mass of all the particles
  - none of these
27. The air in this room has
- energy.
  - mass.
  - weight.
  - all of these
  - none of these
28. The volume of matter comes mostly from its
- protons.
  - neutrons
  - electrons.

29. An iron block is placed in a furnace where it is heated and consequently expands. In the expanded condition, its density
- is more.
  - is less.
  - is the same.
30. Compared to a bar of pure gold, the density of a pure gold ring is
- the same.
  - less.
  - slightly more.
  - much more
31. A kilogram of peaches have more skin area than a kilogram of
- grapefruits.
  - grapes.
  - blueberries.
  - Each has the same skin area.
32. Which cooks faster in boiling oil?
- a whole potato.
  - a sliced potato.
  - Both cook the same.
33. A completely submerged object always displaces its own
- density of fluid.
  - weight of fluid.
  - volume of fluid.
  - all of these
  - none of these
34. The reason that buoyant force acts upward on a submerged object is that
- if it acted downward, nothing would float.
  - the weight of fluid displaced reacts with an upward force.
  - it acts in a direction to oppose gravity.
  - upward pressure against the bottom is greater than downward pressure against the top of the submerged object.
35. Blood pressure is normally greater in your
- feet.
  - same in each
  - ears.
36. Lobsters live on the bottom of the ocean. The density of a lobster is
- equal to the density of sea water.
  - greater than the density of sea water.
  - less than the density of sea water.

37. A balloon is buoyed up with a force equal to the
- density of surrounding air.
  - weight of air it displaces.
  - weight of the balloon and contents.
  - atmospheric pressure.
  - all of these
38. A lobster crawls onto a bathroom scale submerged at the bottom of the ocean. Compared to its weight above the surface, the lobster will have an apparent weight under water that is
- the same.
  - greater.
  - less.
39. The faster a fluid moves, the
- less its internal pressure.
  - greater its internal pressure.
  - internal pressure is unaffected.
40. A suction cup sticks to a wall. It is
- pulled to the wall by the vacuum.
  - pushed to the wall by the atmosphere.
  - both of these
  - neither of these
41. Substances absorb heat energy by the process of
- radiation.
  - convection.
  - conduction.
  - all of these
42. Most of the matter in the universe is in the
- liquid state.
  - gaseous state.
  - solid state.
  - plasma state.
  - none of these
43. To say that evaporation is a cooling process is to say that the
- more energetic particles remain in the water.
  - the less energetic particles escape.
  - more energetic particles escape.

44. When a gas is changed to a liquid state, the gas
- absorbs energy.
  - releases energy.
  - neither releases nor absorbs energy.
  - both releases and absorbs energy.
45. When heat is added to boiling water, its temperature
- increases.
  - does not change.
  - decreases.
46. A quantity of water has more entropy when it is
- at room temperature.
  - frozen ice.
  - boiling.
47. The fact that desert sand is very hot in the day and very cold at night is evidence that sand has
- no specific heat.
  - a low specific heat.
  - a high specific heat.
48. Atmospheric pressure is caused by the
- density of the atmosphere.
  - temperature of the atmosphere.
  - weight of the atmosphere.
  - effect of the sun's energy on the atmosphere.
49. The moderate temperatures of islands throughout the world has much to do with water's
- vast supply of internal energy.
  - high specific heat.
  - poor conductivity.
  - absorption of solar energy.
  - high evaporation rate.
50. A good heat conductor is
- a poor insulator.
  - a good insulator.
  - neither a poor nor a good insulator.