

**Applied Physical Science Exam #8 2008–2009**

Name: \_\_\_\_\_ Class: \_\_\_\_\_ Date: \_\_\_\_\_

***Write True or False in the space provided.***

- 1) The rate at which velocity changes with time is called acceleration. 1) \_\_\_\_\_
- 2) Even though a car is slowing down, it is still accelerating, in the most general definition of acceleration. 2) \_\_\_\_\_
- 3) A ball is thrown into the air. At the highest point, the ball has zero velocity and zero acceleration. 3) \_\_\_\_\_
- 4) A quantity that has only magnitude is called a vector. 4) \_\_\_\_\_
- 5) A single vector can be replaced by two vectors in the  $x$  and  $y$  directions that are at right angles to each other. These two  $x$  and  $y$  vectors are called the resultants of the original vector. 5) \_\_\_\_\_
- 6) Mass is a vector quantity. 6) \_\_\_\_\_
- 7) Any vector can be represented by two other vectors that are at right angles to each other. 7) \_\_\_\_\_
- 8) The metric unit of mass is the newton. 8) \_\_\_\_\_
- 9) The force due to gravity acting on an object is its weight. 9) \_\_\_\_\_
- 10) The combination of all the forces that act on an object is called the net force. 10) \_\_\_\_\_
- 11) The force that supports the weight of a book lying at rest on a tabletop is called a normal force. 11) \_\_\_\_\_
- 12) Pressure is defined as the force one object exerts on another object. 12) \_\_\_\_\_
- 13) A steel ball and a wood ball of the same size are released together from the top of a tower. In the absence of air resistance they both would reach the ground at the same time. The reason for this is that the force on each ball is the same. 13) \_\_\_\_\_
- 14) In order to make a cart move forward, a horse must pull harder on the cart than the cart pulls on the horse. 14) \_\_\_\_\_
- 15) A bicycle and a parked car have a head-on collision. The force of impact is greater on the bicycle. 15) \_\_\_\_\_
- 16) Momentum is defined as an object's mass times its velocity. 16) \_\_\_\_\_

- 17) Impulse is defined as the force exerted on an object times the time it lasts. 17) \_\_\_\_\_
- 18) If the net external force acting on a system is zero, then the total momentum of the system is zero. 18) \_\_\_\_\_
- 19) When two objects collide and completely stick together, the collision is said to be inelastic. 19) \_\_\_\_\_
- 20) If a net force acts on a system, the system's momentum will change. 20) \_\_\_\_\_
- 21) Momentum is a scalar quantity. 21) \_\_\_\_\_
- 22) The unit of work is called the joule. 22) \_\_\_\_\_
- 23) The rate at which work is done is called energy. 23) \_\_\_\_\_
- 24) The energy an object has by virtue of its motion is its kinetic energy. 24) \_\_\_\_\_
- 25) When we carry an object across a room, without lifting it or setting it down, we do no physical work on it. 25) \_\_\_\_\_
- 26) A bug on a turning phonograph record will make more turns per minute if it is located toward the center of the record. 26) \_\_\_\_\_
- 27) Rotational inertia is the resistance an object has to changes in its rotational state. 27) \_\_\_\_\_
- 28) In order to increase his or her rotational inertia, a tightrope walker can carry a long stick. 28) \_\_\_\_\_
- 29) A spinning wheel will maintain its state of angular momentum unless acted on by an external torque. 29) \_\_\_\_\_
- 30) Pressure at the bottom of a lake depends on the weight density of the lake water and on the volume of the lake. 30) \_\_\_\_\_

***Write True or False in the space provided.***

- 31) The buoyant force on a submerged rock is equal to its weight in the water. 31) \_\_\_\_\_
- 32) The weight of fluid displaced by a floating object is equal to the weight of the object. 32) \_\_\_\_\_
- 33) Pressure in a fluid is inversely proportional to the depth at which the pressure measurement is taken. 33) \_\_\_\_\_



**Choose the best answer to each question and write the appropriate letter in the space provided.**

- 43) An apple weighs 1 N. The net force on the apple when it is in free fall is \_\_\_\_\_ 43) \_\_\_\_\_  
\_\_\_\_\_.
- A) 0.1 N.
  - B) 1 N.
  - C) 9.8 N.
  - D) 0 N.
  - E) none of the above
- 44) If you pull horizontally on a crate with a force of 150 N and the crate doesn't move, the friction force must be 150 N. Now if you pull with 250 N so the crate slides at constant velocity, the friction force is \_\_\_\_\_. 44) \_\_\_\_\_
- A) 250 N.
  - B) more than 250 N.
  - C) more than 150 N but less than 250 N.
- 45) Two people pull on a rope in a tug-of-war. Each pulls with 400 N of force. What is the tension in the rope? 45) \_\_\_\_\_
- A) 400 N
  - B) 600 N
  - C) 800 N
  - D) Zero
  - E) none of the above
- 46) A rocket is able to accelerate in the vacuum of space when it fires its engines. The force that propels the rocket is the force \_\_\_\_\_. 46) \_\_\_\_\_
- A) of the exhaust gases on the rocket.
  - B) of the rocket on the exhaust gases.
  - C) neither A nor B
- 47) A 4-kg ball has a momentum of 12 kg m/s. What is the ball's speed? 47) \_\_\_\_\_
- A) 48 m/s
  - B) 12 m/s
  - C) 4 m/s
  - D) 3 m/s
  - E) none of the above
- 48) How much power is expended if you lift a 50-N rock 10 meters in 1 second? 48) \_\_\_\_\_
- A) 5 W
  - B) 50 W
  - C) 0 W
  - D) 10 W
  - E) 500 W
- 49) Stunt motorcyclist Biker Bob rides his bike inside a futuristic rotating space station—a giant rotating donut-shaped structure in space. The normal support force feels like weight to him. As he rides his bike in the opposite direction that the station rotates, the normal force \_\_\_\_\_. 49) \_\_\_\_\_
- A) decreases.
  - B) increases.
  - C) remains unaffected.

- 50) A hydraulic arrangement consists of a water-filled U-tube that is wider on one end than on the other. Pistons are fitted in both ends. To multiply an input force, the input end should be the one having the \_\_\_\_\_.
- 50) \_\_\_\_\_
- A) smaller-diameter piston
  - B) larger-diameter piston
  - C) It doesn't matter what relative size the piston is.

## Answer Key

Testname: EXAM8.TST

- 1) Answer: TRUE
- 2) Answer: TRUE
- 3) Answer: FALSE
- 4) Answer: FALSE
- 5) Answer: FALSE
- 6) Answer: FALSE
- 7) Answer: TRUE
- 8) Answer: FALSE
- 9) Answer: TRUE
- 10) Answer: TRUE
- 11) Answer: TRUE
- 12) Answer: FALSE
- 13) Answer: FALSE
- 14) Answer: FALSE
- 15) Answer: FALSE
- 16) Answer: TRUE
- 17) Answer: TRUE
- 18) Answer: FALSE
- 19) Answer: TRUE
- 20) Answer: TRUE
- 21) Answer: FALSE
- 22) Answer: TRUE
- 23) Answer: FALSE
- 24) Answer: TRUE
- 25) Answer: TRUE
- 26) Answer: FALSE
- 27) Answer: TRUE
- 28) Answer: TRUE
- 29) Answer: TRUE
- 30) Answer: FALSE
- 31) Answer: FALSE
- 32) Answer: TRUE
- 33) Answer: FALSE
- 34) Answer: TRUE
- 35) Answer: TRUE
- 36) Answer: D
- 37) Answer: E
- 38) Answer: B
- 39) Answer: C
- 40) Answer: C
- 41) Answer: B

## Answer Key

Testname: EXAM8.TST

- 42) Answer: B
- 43) Answer: B
- 44) Answer: A
- 45) Answer: A
- 46) Answer: A
- 47) Answer: D
- 48) Answer: E
- 49) Answer: A
- 50) Answer: A