**Multiple Choice** *Identify the choice that best completes the statement or answers the question. Write your letter of choice in the space provided beside the question number.*

_____   1.   Bryce leaves his home and walks 600 m due west to the library. He then walks 200 m due east and stops at the pharmacy. Which equation represents Bryce's total displacement?
   a.   600 m [W] + 200 m [E] = 800 m [W]
   b.   600 m [W] - 200 m [W] = 400 m [W]
   c.   600 m [E] + 200 m [E] = 800 m [E]
   d.   600 m [W] - 200 m [E] = 400 m [E]

_____   2.   Which statement is true about the type of motion represented by this position-time graph?
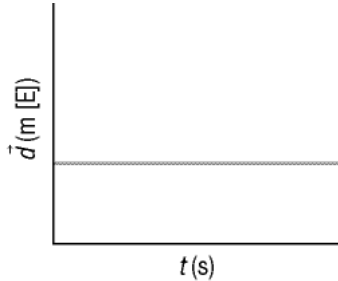
   a.   The object is moving westward at a constant velocity.
   b.   The object is stationary at a location to the west of the reference position.
   c.   The object is stationary at a location to the east of the reference position.
   d.   The object is moving eastward at a constant velocity.

_____   3.   Which term describes a quantity that has magnitude and direction?
   a.   slope
   b.   vector
   c.   scalar
   d.   velocity

_____   4.   Which of the following is an example of non-uniform velocity?
   a.   An airplane flies in a straight path across the sky at a steady speed of 500 km/h.
   b.   A passenger on a merry-go-round travels in a circle at a speed of 0.9 m/s.
   c.   A cheetah runs in a straight path at a constant rate of speed.
   d.   A speed boat travels straight down a river at a steady 70 km/h.

_____   5.   In which direction does the vector in this compass point?
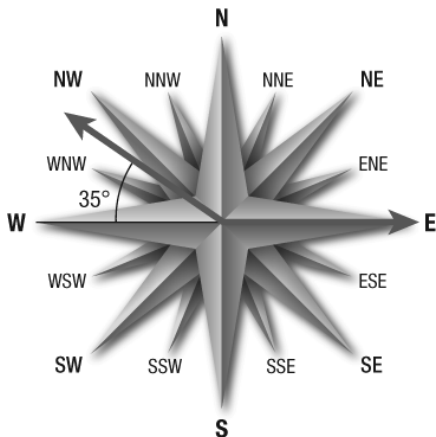
   a.   [W 55° S]
   b.   [W 35° N]
   c.   [S 35° W]
   d.   [N 35° W]

_____ 6. A rabbit walks through a field for a displacement of 35 m [W] and then turns to run away from a snake and heads 55 m [W 34° N]. What is the rabbit's total displacement?
a. 77 m [W 25° N]
b. 66 m [W 17° N]
c. 81 m [W 18° N]
d. 86 m [W 21° N]

_____ 7. Galileo came up with his theories of motion by doing which of the following?
a. rolling balls down ramps
b. watching birds fly
c. dropping rocks into a pond
d. looking at the planets through telescopes

_____ 8. What is the angle of a vector that has components of 3.5 m [E] and 7.2 m [S]?
a. [E 64° S]
b. [S 36° E]
c. [S 64° E]
d. [E 36° S]

_____ 9. In the following system diagram, which of the following can be considered a tension force?


a. the force of the boy pulling on the rope
b. the force of the girl pushing the wagon
c. the normal force on the wagon counteracting gravity.
d. the force of the rope pulling on the wagon

_____ 10. Which of the following objects has the least inertia?
a. a car
b. an atom
c. a cell phone
d. a skyscraper

_____ 11. Which of the following graphs correctly shows the relationship between force and acceleration for a given mass?
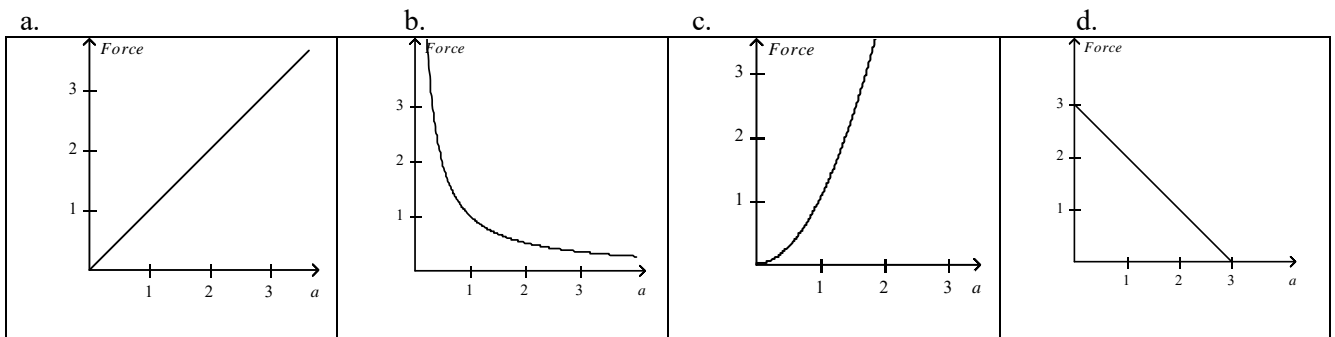
_____ 12. A net force of 42 N is applied to a soccer ball with a mass of 0.33 kg. Determine the acceleration of the soccer ball.
a. 110 m/s^2
b. 140 m/s^2
c. 130 m/s^2
d. 120 m/s^2

_____ 13. Determine the mass of an object that accelerates at a rate of 3.5 m/s² when a net force of 670 N is applied.
  a. 180 kg
  b. 160 kg
  c. 170 kg
  d. 190 kg

_____ 14. A student pushes a box to the left across a rough floor. Which of the following free-body diagrams can be used for this situation?

  a.

  b.

  c.

  d.
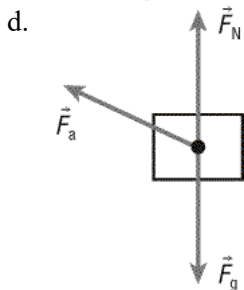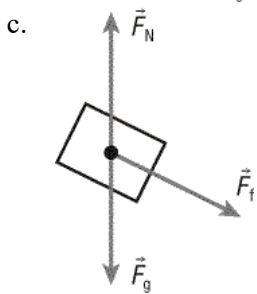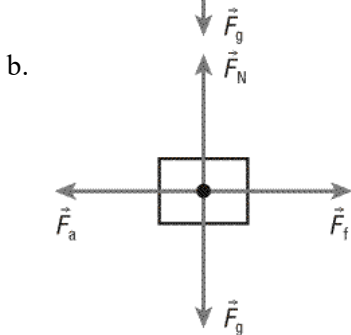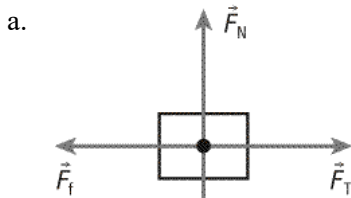
_____ 15. Two students are playing tug of war. Student A has a mass of 54 kg and is pulling with a force of 320 N to the left. Student B has a mass of 61 kg and is pulling with a force of 290 N to the right. Determine the acceleration of the students.
  a. 0.26 m/s²
  b. 0.21 m/s²
  c. 0.17 m/s²
  d. 0.29 m/s²

_____ 16. The weight in the following diagram has a mass of 0.50 kg and the cart has a mass of 0.26 kg. Friction is negligible. What is the acceleration of the cart?
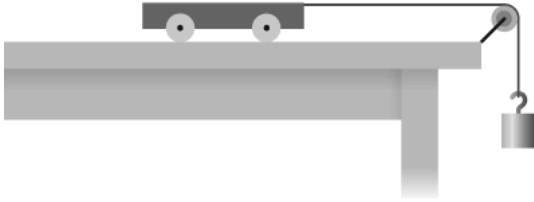
   a. 9.3 m/s^2
   b. 7.2 m/s^2
   c. 8.1 m/s^2
   d. 6.4 m/s^2

_____ 17. A 156 g hockey puck is initially travelling with a speed of 18 m/s. The force of friction acting on the puck is 0.30 N. If no other forces act on the hockey puck, how far will it slide before coming to rest?
   a. 168 m
   b. 84 m
   c. 42 m
   d. 21 m

_____ 18. In the following diagram the bottom block is being pulled downward with a force of 15 N. Calculate the tension in rope A if the mass of the top block is 2.0 kg and the mass of the bottom block is 5.0 kg.

rope A

rope B
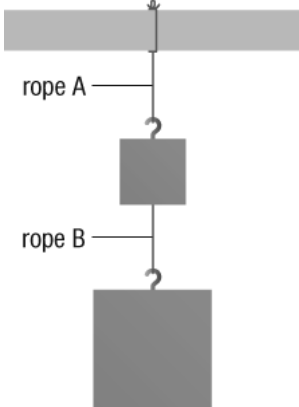
   a. 72 N
   b. 69 N
   c. 64 N
   d. 84 N

_____ 19. Which of the following forces balances gravity for falling objects?
   a. tension
   b. electromagnetic force
   c. air resistance
   d. strong force

_____ 20. Which of the following is correctly measured with a balance?
   a. density
   b. weight
   c. mass
   d. Volume

Solutions #1-20

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.
B	C	B	B	B	D	A	A	D	B	A	C	D	B	A	D	B	D	C	C