PracTest PHY.02 - Newton's Laws

Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. Galileo
   A. invented the telescope
   B. explained how the Earth could be moving
   C. was found innocent by the Catholic Church
   D. used the telescope to prove that the Earth was the center of all motion
   E. experimentally verified Aristotle's explanation of motion

2. The resistance an object has against acceleration is called
   A. inertia B. weight C. drag D. tension

3. Mass is
   I. a measure of the weight of an object
   II. the quantity of matter in an object
   III. the extent to which an object resists constant velocity
   A. I only C. III only E. I and III only G. I, II and III
   B. II only D. I and II only F. II and III only H. None of these

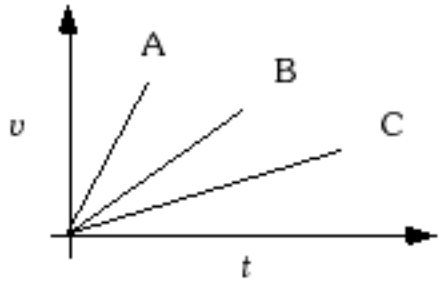
4. An object remains at rest. We can therefore conclude
   A. there are no forces acting on it C. there is a net force acting to the left
   B. there is a net force acting to the right D. the net force acting on it is zero

5. A heavy crate is pushed across a floor at a constant velocity. Friction is present between the crate and floor. During this motion, the force of friction is _?_ the force pushing the crate forward.
   A. greater than B. less than C. equal to

6. When the net force acting on an object doubles, the resulting acceleration
   A. quadruples C. remains the same E. none of these
   B. doubles D. halves

7. A marker pen with a certain mass is blown through a tube with a certain force and experiences a certain acceleration. Which of the following arrangements will result in marker pen experiencing an equal acceleration?
   A. A pen with half the mass acted on by twice the net force
   B. A pen with twice the mass acted on by half the net force
   C. Both of these
   D. None of these

Graph B represents the velocity vs. time plot of a cart with a certain mass pulled by a certain force.



8. Graph C represents the motion of a cart with _?_ mass pulled by _?_ force.
   A. half the; half the
   B. the same; the same
   C. twice the; twice the
   D. half the; the same
   E. the same; half the
   F. the same; twice the

9. A 5 kg wagon is pushed with a 10 N net force. What is the resulting acceleration of the wagon?
   A. $0.5\,m/s^2$ B. $2\,m/s^2$ C. $5\,m/s^2$ D. $20\,m/s^2$ E. $50\,m/s^2$

10. A certain force gives a 5 kg object an acceleration of $2\,m/s^2$. The same force would give a 20 kg object an acceleration of
    A. $0.5\,m/s^2$ B. $1\,m/s^2$ C. $2\,m/s^2$ D. $8\,m/s^2$

11. The weight of a 60 kg person is
    A. 6.1 N B. 60 N C. 69.8 N D. 588 N

A tennis ball and a steel sphere are dropped from the same height above level ground (neglect air resistance).

12. Which hits the ground with the greater speed?
    A. the tennis ball
    B. the steel sphere
    C. same for both

13. If you were to sit on the ground, there would be a force due to gravity pulling you toward the Earth. The other force in the Newton's 3rd law force pair is
    A. the force of the ground pushing you up.
    B. the force you exert on the ground beneath you.
    C. your gravitational pull upward on the Earth.
    D. There is no Newton's 3rd law force pair for force due to gravity.

14. When a large asteroid collides with a smaller one in space,
    A. the larger asteroid exerts a greater force on the smaller asteroid than the smaller one exerts on the larger one.
    B. the small asteroid will undergo a greater acceleration than the larger one.
    C. both A and B.
    D. neither A nor B.

15. One of the demonstrations performed in class involved a dumbbell and two strings. In this demonstration
I. the top string was broken when the bottom string was pulled slowly
II. the bottom string was broken when the bottom string was pulled quickly
III. the primary principle demonstrated was inertia

A. I only C. III only E. I and III only G. I, II and III
B. II only D. I and II only F. II and III only H. None of these

16. [On the Shores of the Cosmic Ocean] Mount Olympus (Olympus Mons) and Mariner Valley (Valles Marineris) can both be found on

A. Venus B. Earth C. Mars D. Jupiter

17. [Mechanical Universe-Inertia] A ball is dropped from the top of a mast on a moving ship. The ball will hit the deck

A. between the mast and the rear of the boat. B. at the base of the mast.

18. [Mechanical Universe-Newton's Laws] When launched as a projectile, a body's motion has two components

A. independent of each other. C. equal in magnitude and opposite in direction.
B. related to each other by velocity. D. related to each other by gravity.

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Answer Section

MULTIPLE CHOICE

1. ANS: B TOP: Inertia NOT: PT
2. ANS: A TOP: Inertia NOT: PT
3. ANS: B TOP: Inertia NOT: PT
4. ANS: D TOP: Zero Net Force NOT: PT
5. ANS: C TOP: Zero Net Force NOT: PT
6. ANS: B TOP: a=F/m NOT: PT
7. ANS: D TOP: a=F/m NOT: PT
8. ANS: E TOP: Force Before Cart NOT: PT
9. ANS: B TOP: F=ma Calculation NOT: PT
10. ANS: A TOP: F=ma Calculation NOT: PT
11. ANS: D TOP: Weight NOT: PT
12. ANS: C TOP: Steel Tennis NOT: PT
13. ANS: C TOP: N3 Force Pairs NOT: PT
14. ANS: B TOP: Newton III NOT: PT
15. ANS: G TOP: Newtonian Demos NOT: PT
16. ANS: C TOP: 101
17. ANS: B TOP: MU-Inertia
18. ANS: A TOP: MU-Newton's Laws