1. The sum of all the forces on a falling object at terminal velocity is zero.
   A. True
   B. False

2. According to Newton’s first law, a body at rest will remain at rest unless acted upon by an unbalanced force.
   A. True
   B. False

3. ____ is the property that resists changes in motion.
   A. Movement
   B. Acceleration
   C. Heavyness
   D. Inertia

4. The amount of force that gives a mass of one kilogram an acceleration of 1 m/s² is one Newton.
   A. True
   B. False

5. An unbalanced force acting on a body produces an acceleration.
   A. True
   B. False

6. The average speed of an object is defined to be the _____.
   A. change in its velocity divided by the time this change takes
   B. distance it travels multiplied by the time it takes
   C. distance it travels divided by the time it takes
   D. change in its velocity multiplied by the time this change takes

7. If a woman walks at a speed of 5 miles/hour for 3 hours, she will have walked _______.
   A. 5 miles
   B. 8 miles
   C. 10 miles
   D. 15 miles

8. If a car changes speed from 50 m/s to 54 m/s in ten seconds, its average acceleration is _____.
   A. 40 m/s²
   B. 5.0 m/s²
   C. 0.4 m/s²
   D. 5.4 m/s²

9. The moon is a nice place to study free-fall because it has no atmosphere. If an astronaut on the moon simultaneously drops a hammer and a feather from the same height, which one hits the ground first?
   A. the hammer
   B. the feather
   C. They hit at the same time.
   D. They don’t fall.

10. Suppose that you look out a tenth-floor window and see a ball falling at 15 m/s. How fast will this ball be falling 1 s later?
    A. 15 m/s
    B. 20 m/s
    C. 25 m/s
    D. 30 m/s
11. An object is dropped off a cliff. What is its speed four seconds later?
A. 20 m/s  B. 40 m/s  C. 60 m/s  D. 80 m/s

12. If a ball is dropped from rest, it will fall 5 m during the first second. How far will it fall during the second, second?
A. 5 m  B. 10 m  C. 15 m  D. 20 m

13. If a ball falls 50 meters, how fast will it be going when it hits the ground?
A. 32 m/s  B. 64 m/s  C. 16 m/s  D. 100 m/s

14. How far will a ball fall in 4.5 seconds if we ignore air resistance?
A. 200 m  B. 60 m  C. 100 m  D. 500 m

15. Terminal velocity for a human being is about _______ mph.
A. 50  B. 60  C. 200  D. 120

16. The property that an object at rest tends to remain at rest is known as
A. inertness  B. inertia  C. resistance  D. sluggishness

17. If there is no unbalanced force acting on an object, its motion will be one with _______ acceleration.
A. zero  B. a constant, non-zero  C. an increasing  D. a decreasing

18. Assume that you are driving down a straight road at constant speed. A small ball is tied on the end of a string hanging from the rear view mirror. Which way will the ball swing when you apply the brakes?
A. forward  B. backward  C. It will not swing.  D. It depends on how hard you apply the brakes.

19. What is the net force on an 800-kg airplane flying with a constant velocity of 160 km/hour north?
A. zero  B. 160 N  C. 800 N  D. 128 000 N

20. When the same unbalanced force is applied to two blocks, the yellow one has a larger acceleration than the blue one. Which of the following is correct?
A. The yellow block has a larger mass.
B. The blue block has a larger mass.
C. They have the same mass.
D. The yellow block has a larger weight.

21. If the mass and weight of an astronaut are measured on the earth and on the moon, we will find that the masses are _____ and the weights are _____.
A. the same ... the same  B. different ... different
C. the same ... different  D. different ... the same
22. Which of the following is a vector quantity?
A. speed B. velocity
C. distance D. mass

23. Which of the following types of motion are classified according to the path an object takes?
A. circular B. uniform accelerated
C. rolling D. sliding

24. The pound is an English unit of measure; its SI counterpart is the
A. Newton B. kilogram
C. joule D. momentum

25. A force causes a mass to experience an acceleration “a”. If the force is doubled and the mass is reduced by 1/2, the acceleration is
A. a. B. 2a.

26. When you pull a shoe across the floor by its shoestrings, the resisting friction force does not depend on
A. the type of floor B. the type of shoe
C. how hard you pull. D. how heavy the shoe is

27. What is the inertia of a 100 kg block?
A. 100 pound B. 100 kg
C. 1 N D. 1000 N

28. In the Mystery Powders experiment which of the following substances reacted with the vinegar solution:
A. baking soda B. alka seltzer
C. baking powder D. A and B only
E. A, B, and C

29. In the Mystery Powders experiment, one could distinguish between granulated sugar and table salt by
A. physical examination with a magnifier B. reaction with water
C. reaction with vinegar D. reaction iodine
E. A and D only

30. In the Mystery Powders experiment, one had an unknown composed of two substances. The following observations were made:
   Adding water – bubbles formed
   Adding vinegar – bubbles formed
   Adding iodine – blue-black color and bubbles
The most likely substances in the unknown would be:
A. Instant dry milk and table salt B. Flour and potato flakes
C. Corn starch and alka seltzer D. Powdered sugar and plaster of Paris
E. Rock salt and alka seltzer
31. The motion of an object that is represented between points L and M on the CASE 2 graph and the motion of an object that is represented between zero seconds and point P on the CASE 3 graph have something in common. What is it that they have in common?
A. Both objects possess non-zero acceleration.
B. Both objects possess zero acceleration.
C. Both objects are traveling away from the origin.
D. Both objects possess negative acceleration.

32. What is the velocity of the object in CASE 3 during the time interval between 0 and 6 seconds?
A. 7 m/s
B. 5 m/s
C. 35 m/s
D. Zero

33. Where on the CASE 1 graph do you observe negative acceleration (deceleration)?
A. From 0 to 7 seconds.
B. From 7 to 15.
C. From 15 to 20 seconds.
D. NOTA, there is no negative acceleration.

34. What was the average velocity of the object represented by CASE 4 over the complete 20 seconds?
A. 7.8 m/s
B. 142 m/s
C. 21 m/s
D. NOTA, there is not enough information
**DISTANCE OF FALL VS. TIME**

**VELOCITY OF FALL VS. TIME**