Physics: Unit 7 Practice Assessment

Identify the letter of the choice that best completes the statement or answers the question. In the space next to the question, indicate how much confidence you have in your answer (C = Confident; S = So-so; G = Guessed).

1. Which of the following is NOT a fundamental force in nature?
   A. Strong  B. Weak  C. Medium  D. Gravity

2. Of the 4 fundamental forces, into which 2 categories can you classify all the forces that act on you?
   A. Strong and Weak.
   B. Electromagnetic and Strong.
   C. Gravity and Strong.
   D. Electromagnetic and Gravity.

3. Which of the following forces arises from direct physical contact between two objects?
   A. Gravitational  B. Fundamental  C. Contact  D. Field

4. According to Galileo, the true nature of all objects is to:
   A. come to rest.
   B. return to their natural place.
   C. maintain their present state of motion.
   D. fall to the center of the universe.

5. The tendency to resist changing motion is called:
   A. inertia  B. force  C. acceleration  D. velocity

6. The length of a force vector represents the:
   A. cause of the force.
   B. direction of the force.
   C. magnitude of the force.
   D. type of the force.

7. Which of the following is the cause of acceleration?
   A. speed  B. inertia  C. force  D. velocity

8. If the net force on an object is zero, what will happen to the object’s motion?
   A. the object will accelerate.
   B. the object will come to rest.
   C. the object will continue moving with constant velocity.
   D. None of the above.

9. Newton’s 2nd Law says:
   A. an object at rest will remain at rest.
   B. an object in motion will remain moving with a constant velocity.
   C. an object experiencing a net force will accelerate.
   D. Both A and B are true.

10. Which statement about the acceleration of an object is correct?
    A. The acceleration of an object is directly proportional to the net external force acting on the object and inversely proportional to the mass of the object.
    B. The acceleration of an object is directly proportional to the net external force acting on the object and directly proportional to the mass of the object.
    C. The acceleration of an object is inversely proportional to the net external force acting on the object and inversely proportional to the mass of the object.
    D. The acceleration of an object is inversely proportional to the net external force acting on the object and directly proportional to the mass of the object.
11. If a horizontal force of 25 N is applied to an object that weighs 75 N when it is on a frictionless surface, what is the acceleration of the object?
   A. 0.33 m/s²  B. 3.3 m/s²  C. 50 m/s²  D. 1.0 x 10² m/s²

12. If the net force acting on an object is tripled, what will happen to the resulting acceleration?
   A. Acceleration will triple.
   B. Acceleration will reduce to a third of the previous value.
   C. Acceleration will increase nine times.
   D. Acceleration will not be affected by the increased net force.

13. If the mass of an object is tripled, what will happen to the resulting acceleration, assuming the same net force is acting?
   A. Acceleration will triple.
   B. Acceleration will reduce to a third of the previous value.
   C. Acceleration will increase nine times.
   D. Acceleration will not be affected by the increased mass.

14. If the mass of an object is tripled, and the net force acting on it is also tripled, what will happen to the resulting acceleration?
   A. Acceleration will triple.
   B. Acceleration will reduce to a third of the previous value.
   C. Acceleration will increase nine times.
   D. Acceleration will not be affected by the change.

15. As a basketball player starts to jump for a rebound, the player begins to move upward faster and faster until his shoes leave the floor. At the moment the player begins to jump, the force of the floor on the shoes is:
   A. greater than the player’s weight.
   B. equal in magnitude and opposite in direction to the player’s weight.
   C. less than the player’s weight.
   D. zero.

16. Newton’s third law of motion says that a single interaction:
   A. involves one object and produces one force.
   B. involves one object and produces two forces on the same object.
   C. involves two objects and produces one force.
   D. involves two objects and produces two forces, one on each object.

17. A hammer drives a nail into a piece of wood. Identify an action-reaction pair in this situation.
   A. The nail exerts a force on the hammer; the hammer exerts a force on the wood.
   B. The hammer exerts a force on the nail; the wood exerts a force on the nail.
   C. The hammer exerts a force on the nail; the nail exerts a force on the hammer.
   D. The hammer exerts a force on the nail; the hammer exerts a force on the wood.

18. A ball is dropped from a person’s hand and falls to Earth. Identify an action-reaction pair in this situation.
   A. The hand exerts a force on the ball; Earth exerts a force on the hand.
   B. Earth exerts a force on the ball; the hand exerts a force on Earth.
   C. Earth exerts a force on the hand; the hand exerts a force on the ball.
   D. Earth exerts a force on the ball; the ball exerts a force on Earth.

19. The magnitude of the gravitational force acting on an object is
20. If a bug has a head on collision with a truck, which experiences the greater magnitude force?
   A. The bug
   B. The truck
   C. They both experience the same magnitude force
   D. It depends on how fast each is moving

Use the diagram below to answer Q21-23.

21. Which force represents the normal force on the box?
   A. F₁  B. F₂  C. F₃  D. F₄

22. Which force represents the force of gravity on the box?
   A. F₁  B. F₂  C. F₃  D. F₄

23. How do you know that the box is accelerating?
   A. F₁ is equal and opposite to F₃
   B. F₁ is equal to F₂
   C. F₃ is greater than F₄
   D. F₂ is greater than F₄

24. Which of the following forces is always parallel to the surface the object is on?
   A. Normal force  B. Force of gravity  C. Applied force  D. Frictional force

25. Which of the following forces is always perpendicular the direction of motion?
   A. Normal force  B. Force of gravity  C. Applied force  D. Frictional force

26. A car moves forward along a level road at constant velocity. The additional force needed to bring the car into equilibrium (make the net force zero) is
   A. greater than the normal force times the coefficient of static friction.
   B. equal to the normal force times the coefficient of static friction.
   C. the normal force times the coefficient of kinetic friction.
   D. zero.

27. What 2 factors determine the force of sliding friction on an object?
   A. Weight and Normal Force
   B. Weight and Coefficient of Friction
   C. Normal Force and Coefficient of Friction
   D. Normal Force and the Force of Gravity

28. Reducing the normal force to one half will cause the force of sliding friction between the two surfaces to:
   A. double.  B. quadruple.  C. halve.  D. remain the same.
29. A constant force of 10 N is applied to a box in the direction of motion to make it move at a constant speed. If the box weighs 50 N, what is the coefficient of kinetic friction?
   A. 10  B. 50  C. 5  D. 0.2

30. If an object has a mass of 2.00 kg, what is its weight on earth?
   A. 2.00 N  B. 19.6 N  C. 9.81 N  D. 0.20 N

Use the following diagram to answer Q31-33.

31. If a block is sliding down a hill that is at an angle of 15°, what is the angle \( \theta \) between the force of gravity and the y-axis?
   A. 0°  B. 15°  C. 30°  D. None of the above.

32. If a block is sliding down a hill that is at an angle of 15°, as shown above, what is true of the normal force?
   A. It is equal to the gravitational force acting on the block
   B. It is greater than the gravitational force acting on the block
   C. It is less than the gravitational force acting on the block
   D. It cannot easily be determined

33. If an object accelerates down an incline, what must be true?
   A. There is a net force
   B. The system is in equilibrium
   C. There is no friction
   D. The forces are balanced