Name:_____per._____

Physics Study Guide – Chapter 7 Momentum

1. What is the definition of momentum? _____

   _____

2. Explain why dashboards have padding.

   _____

   _____

3. A piece of clay with 5 units of momentum strikes a bowling ball at rest and sticks to it. How much momentum should the bowling ball and clay move off with? Explain_____

   _____

4. Superman thrown an asteroid into space that is more massive than he. Which moves away faster. Explain.

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5. If the momentum of an object is changing and the mass remains constant… the _____ is changing, the object is _____, and there is a _____ acting on the object.
6. _____ Collisions cause no heat increase, conserve kinetic energy, cause no deformation, and generate no friction.
7. _____ Collisions cause heat increase, do not conserve KE, cause deformation, and shape change.
8. Baseball catchers often move the mit back as they catch a fastball in order to _____ the time of impact and _____ impact force
9. What units are used for measuring momentum? _____
10. What equation is used for measuring momentum? _____
11. One can increase the momentum of a golf ball by increase _____ and increasing impact _____.
12.
13. What is “momentum change”? _____
14. Give the <u>vocab term</u> for what causes “momentum change”? _____
15. What is the <u>equation</u> that describes the cause of “momentum change”_____
16. There are two things that you could do different to make the <u>Impulse</u> on an object greater. What two things affect the momentum change of an object? _____

17. Use the example of punting a football and explain how you might do two things differently to make the change in momentum of the football different? _____

_____

18. Explain why dashboards have padding.

_____

_____

19. If two objects are going the same velocity, can you say with certainty that their momentum must be the same? Why or why not?_____

20. State whether the next cars need more, less or the same FORCE to stop them than this car: A 1000 kg car moving 20 m/s stops in 100 m.
    a. A 1000 kg car moving 20 m/s stopping in 50 m _____
    b. A 1000 kg car moving 30 m/s stopping in 100 m_____
    c. A 2000 kg car moving 20 m/s stopping in 100 m_____

21. State exactly WHY you would need more, less, or the same amount of force in the preceding situations.
    a. _____
    b. _____
    c. _____

22. What does the "Law of Conservation of Momentum" state? _____

_____

23. How does the force of a cannon on a cannonball compare to the force of the cannonball on the cannon?

_____

24. If the answer to the question above is true, why doesn't the cannon itself fly backwards the same as the cannonball? _____

_____

25. What is an elastic collision? _____
26. What is an inelastic collision? _____
27. Which mathematical equation you would use for two objects that collide "elastically":

_____

28. Which mathematical equation you would use for two objects that collide "inelastically":

_____

29. Why is the equation different between elastic and inelastic? _____

_____

30. If a large mass moves with 10 units of momentum and strikes an equally large mass which is at rest, how much momentum will the two objects possess after the collision? _____
31. What is the primary reason for a why a rifle usually shoots farther than a pistol? _____

_____

32. A train car moving 12 m/s hits and couples with another the same weight which is not moving, how fast will they be moving afterward, (explain?) _____

_____

33. Now both those cars collide with a third stationary car. How fast will they be going? (explain?)

_____

34. Two kids balancing on skateboards push off each other in opposite directions. One kid is twice as big and zooms backwards 2m/s. How fast will the smaller kid go? (explain?) _____

_____

35. Santa Claus accidentally runs into your 2000 kg SUV with his sled. If his sled weighs 1000 kg and was moving 30mph when it hit, <u>how fast will they both slide together</u> across your freakishly frozen Rocklin front yard? (show 5 steps!)

36. If his sled and your SUV then hit the garage door and it takes 3 seconds for them to come crashing to a stop inside your garage, <u>how much average force did it take to stop them</u>? (show 5 steps!)