**Level-1 and Honors Physics**

**Mid-Term Review**

**(Answers will be posted in C127)**

1. Speed is
   1. a measure of how fast something is moving
   2. the distance covered per unit of time
   3. measured in terms of a unit of distance divided by a unit of time
   4. all of the above
2. When you look at a speedometer in a moving car, you can see the car’s
   1. Instantaneous speed
   2. Average speed
   3. Instantaneous acceleration
   4. Average acceleration
   5. Average distance traveled
3. Suppose you take a trip that covers 240 m and takes 4 seconds. Your average speed is
   1. 480 m/s
   2. 240 m/s
   3. 120 m/s
   4. 60 m/s
4. Acceleration is defined as the CHANGE in
   1. Position divided by the time interval
   2. Velocity divided by the time interval
   3. Time it takes to move from one speed to another speed
   4. Time it takes to move from one place to another place
5. Suppose you are in the car that is going around a curve. The speedometer reads a constant 30 km/hr. Which of the following is NOT true?
   1. You and the car are accelerating
   2. Your speed is constant
   3. Your velocity is constant
   4. The magnitude of your acceleration is constant
6. Suppose a car is moving in a straight line and steadily increases its speed from 15 m/s in the first second to 20 m/s in the next second. What is the car’s acceleration?
   1. 5 m/s/s
   2. 10 m/s/s
   3. 15 m/s/s
   4. 35 m/s/s
7. On a displacement versus time graph the slope of the graph is the
   1. Rate of change of acceleration
   2. Total displacement
   3. Velocity
   4. Acceleration
8. On a velocity versus time graph the slope of the graph is the
   1. Rate of change of acceleration
   2. Total displacement
   3. Velocity
   4. Acceleration
9. On a velocity versus time graph the area under the graph is the
   1. Rate of change of acceleration
   2. Total displacement
   3. Velocity
   4. Acceleration
10. A vector is a quantity that has
    1. magnitude and time.
    2. magnitude and direction.
    3. direction and time.
    4. all of the above
11. When velocity is represented as a vector,
    1. the length of the arrow represents speed
    2. the length of the arrow is drawn to suitable length
    3. the diction of the arrow shows the direction of motion
    4. all of the above
12. What is the minimum resultant possible when adding a 3-unit vector to an 8-unit vector?
    1. 24-unit vector
    2. 11- unit vector
    3. 8- unit vector
    4. 5- unit vector
13. What is the maximum resultant possible when adding a 3-unit vector to an 8-unit vector?
    1. 24-unit vector
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    3. 8- unit vector
    4. 5- unit vector
14. An airplane flying into a headwind loses ground speed, and an air plane flying with the wind gains ground speed. If an airplane flies at right angles to the wind, then ground speed is\_\_\_\_\_\_.
    1. less
    2. unchanged
    3. more
15. Which of the following would NOT be considered a projectile?
    1. A cannonball thrown through the air
    2. A cannonball rolling down a slope
    3. A cannonball thrown straight up
    4. A cannonball rolling off the edge of a table
16. The horizontal component of a projectile’s velocity is independent of
    1. the vertical component of its velocity
    2. the range of the projectile
    3. time
17. A ball is thrown into the air at some angle between 10 degrees and 90 degrees. At the very top of the balls path its velocity is
    1. entirely vertical
    2. entirely horizontal
    3. both vertical and horizontal
    4. There’s not enough information given to determine.
18. The acceleration for an object experiencing projectile motion\_\_\_\_\_\_\_.
    1. increases throughout the flight
    2. increases until it reaches the top of its flight then decreases
    3. remains the same throughout the flight
    4. is zero at the top of the flight
19. The law of inertia states that an object
    1. at rest will remain at rest unless acted on by an outside force
    2. will continue moving at the same velocity unless an outside force acts on it.
    3. will continue moving in a straight line unless and outside force acts on it.
    4. all of the above
20. The law of inertia applies to
    1. moving objects
    2. objects at rest
    3. both moving and non moving objects
21. Which has more mass, a kilogram of feathers or a kilogram of gold?
    1. The feathers
    2. The Gold
    3. It only depends on the shape
    4. Neither, the masses are equal
22. A 10-N force and a 30-N force act on an object in opposite directions. What is the net force on the object?
    1. 10-N
    2. 20-N
    3. 30-N
    4. 40-N
23. The acceleration produced by a net force on an object is\_\_\_\_\_\_.
    1. directly proportional to the magnitude of the net force
    2. in the same direction as the net force
    3. inversely proportional to the mass of the object
    4. all of the above
24. If the force on a cart doubles, what happens to the cart’s acceleration?
    1. It quadruples
    2. It doubles
    3. It halves
    4. It quarters
25. A girl who weight is 200-N hangs from a bar supported by two strands of rope. What is the tension in each strand?
    1. 400-N
    2. 300-N
    3. 200-N
    4. 100-N
26. A tennis ball and a solid steel ball of the same size are dropped at the same time. In the absence of air resistance, which ball had the greater acceleration?
    1. The tennis ball
    2. The steel ball
    3. They both have the same acceleration
27. According to Newton’s 3rd Law, forces always occur
    1. when velocities are constant
    2. as single quantities
    3. in pairs
    4. in triplets
28. Which has greater linear speed, a horse near the outside rail of a merry-go-around or horse near the inside rail?
    1. The outside horse
    2. The inside horse
    3. Neither- the both have the same linear speed
29. What is the direction of the force that acts on the clothes in the spin cycle of a washer machine?
    1. Outward
    2. Inward
    3. Up
    4. Down
30. A tin can whirled on the end of a string moves in a circle because\_\_\_\_\_.
    1. once the can starts moving, that is its natural tendency
    2. the can continually pulls on the string
    3. there is a force on the can pulling it outward
    4. the string continually pulls inward on the can
31. If you whirl a tin can on the end of a string and the string suddenly breaks, the can will
    1. Fly directly away from you.
    2. Fly directly toward you.
    3. Fly off, tangent to its circular path.
    4. Spiral away from your hand.
32. The gravitational force between two massive spheres
    1. Is always an attraction.
    2. Depends on how massive they are.
    3. Depends inversely on the square of the distance between them.
    4. All of the above
33. Suppose the gravitational force between two massive balls is 10 N. If the distance between the balls is cut in half, what is the force between the masses?
    1. 40 N
    2. 20 N
    3. 5 N
    4. 2.5 N
34. Suppose the gravitational force between two massive balls is 10 N. If the mass of one of the balls is doubled, what is the force between the masses?
    1. 40 N
    2. 20 N
    3. 5 N
    4. 2.5 N
35. The value of the acceleration due to gravity\_\_\_\_\_.
    1. depends on the radius of earth
    2. depends on the mass of the earth
    3. is different on all planets
    4. all of the above
36. The fastest moving planet in a solar system is\_\_\_\_\_\_.
    1. the smallest planet
    2. the most massive planet
    3. the planet nearest to the sun
    4. the planets farthest from the sun
37. Which has more momentum, a large truck moving at 30 miles per hour or a small less massive truck moving at 30 miles per hour?
    1. The large truck
    2. The small truck
    3. Neither- the both have the momentum
38. Compared to a sports car moving at 30 miles per hour, the same sports car moving at 60 miles per hour has\_\_\_\_\_\_\_.
    1. the same momentum
    2. twice as much momentum
    3. four times as much momentum
39. If the momentum of an object is changing, and its mass remains constant\_\_\_\_\_\_\_.
    1. its velocity is changing
    2. it is accelerating (or decelerating)
    3. there is a force acting on it
    4. all of the above
40. The change in momentum of an object is equal to the \_\_\_\_\_\_.
    1. Force acting on it
    2. Velocity change of the object
    3. Impulse acting on it
    4. Object’s mass times the force acting on it
41. If Superman © at rest in free space throws an asteroid that has more mass than Superman ©, then which move faster?
    1. The asteroid
    2. Superman ©
    3. They both move at the same speed
42. A Skater traveling at high speed needs a certain amount of force to stop in a certain time. More stopping force is needed to stop him in the same time, if he has\_\_\_\_\_.
    1. more mass
    2. more momentum
    3. less stopping distance
    4. all of the above
43. A Ping-Pong® ball launcher is fired. Compare to the impulse on the ball the amount of impulse on the launcher is\_\_\_\_\_\_\_.
    1. larger
    2. smaller
    3. the same
    4. all of the above
44. The cannonball launched from a cannon with a long barrel will be faster because the cannonball receives a greater\_\_\_\_\_\_.
    1. force
    2. impulse
    3. both a and b
    4. neither a nor b
45. To have a larger change in momentum of an object with an applied force you could\_\_\_\_\_\_\_\_.
    1. decrease the time that the force is applied
    2. increase the time that the force is applied
    3. change the direction of the force
    4. decrease the size of the force