Physics 122
Review – Multiple Choice

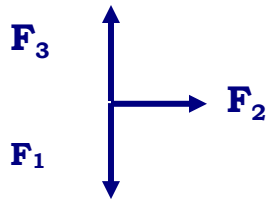
Name - _____

Print the letter of the best answer on the line provided.

___ 1. A rock is suspended from a string and moves downward at a constant speed. Which statement is true concerning the tension in the string if air resistance is not ignored?

a) It is equal to the weight of the rock.
b) It is zero.
c) It points downward.
d) It is less than the weight of the rock.

___ 2. Three boys each pull with a 15 N force on the same point of an object at the same time. The resultant force will be:



a) zero
b) 15 N to the right
c) 15 N down
d) 15 N up

___ 3. Constant acceleration on a velocity-time graph produces a graph that is

a) a straight line
b) parallel to the vertical axis
c) half a parabola
d) parallel to the horizontal axis

___ 4. As a car goes around a circular track, the speedometer needle remains in the same position. The acceleration of the car is:

a) constant in magnitude and direction
b) constant in direction but variable in magnitude
c) constant in magnitude but variable in direction
d) zero

___ 5. As an object moves closer to the center of the Earth, its weight,

a) remains constant
b) is inversely related to the square of the product of the object's mass and the Earth's mass
c) is inversely related to its distance from the center of the Earth
d) increases

___ 6. A small plane climbs with a constant speed of 250 m/s at an angle of 28^{o} with respect to the horizontal. Which statement is true concerning the magnitude of the net force on the plane?

a) It is equal to zero.
b) It is equal to the weight of the plane.
c) It is equal to the magnitude of the force of air resistance.
d) It is equal to the component of the weight of the plane in the direction of motion.

___ 7. A student adds two displacement vectors with magnitudes of 5.8 m and 9.2 m. Which of the following could be a possible resultant?

a) 1.5 m
b) 9.2 m
c) 16 m
d) 53 m

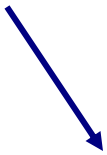
___ 8. Speed is a quantity that
a) always needs a reference point
b) is sometimes negative
c) is always a vector
d) has only magnitude

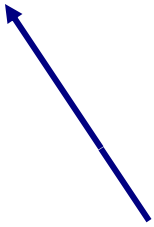
___ 9. A body is kept moving in a circle of constant radius. If the speed of the body is changed to three times its original value, centripetal acceleration will:
a) remain constant
b) decrease to one-third its original value
c) decreases to one-ninth its original value
d) increase to nine times its original value

___ 10. When a person stands on a scale in an elevator at rest, the scale reads 800 N. When the elevator is allowed to fall freely, the scale reads:
a) 1600 N
b) 0 N
c) 800 N
d) 400 N

___ 11. A rock is thrown straight up from the Earth's surface. Which statement concerning the net force acting on the rock at the top of its path is true? Ignore air resistance.
a) It is instantaneously equal to zero.
b) It is equal to the weight of the rock.
c) It is less than the weight of the rock, but greater than zero.
d) It is greater than the weight of the rock.

___ 12. Study the vector **V** below. Which diagram represents –2**V**?

a) 

b) 

c) 

d) 

___ 13. The area under a curve on a velocity-time graph for an object moving with a uniform acceleration is the ____ of that object.

a) acceleration
b) displacement
c) velocity
d) speed

___ 14. When a projectile is fired at an angle, the initial vertical component of the projectile's velocity is ___ the vertical velocity of the projectile at the highest point in its trajectory.

a) greater than
b) equal to
c) less than

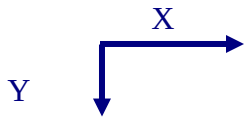
___ 15. A 50 kg cart rests on a frictionless surface. A net force of 75 N acts on the cart over a distance of 2.0 m. What maximum speed does the cart reach?

a) 0.4 m/s
b) 1.5 m/s
c) 2.4 m/s
d) 2.7 m/s

___ 16. As the distance between two bodies decreases, the force of attraction between the bodies:

a) decreases
b) increases
c) remains the same

___ 17. Which vector represents the resultant of X and Y?



a) 
b) 
c) 
d) 

___ 18. After a body falls freely for 7.01 s, the acceleration of the body is:

a) $-9.80\ m/s^2$
b) $-24.5\ m/s^2$
c) $-49.0\ m/s^2$
d) $-126\ m/s^2$

___ 19. A pendulum has a period of 1.0 s. If the length of the pendulum is tripled, its period will be:

a) 0.50 s
b) 1.4 s
c) 1.7 s
d) 4.0 s

___ 20. A horizontal force of 42 N is used to move a 7.0 kg cart. What is the acceleration of the cart if there is a force of friction of 28 N?

a) $0.5\ m/s^2$
b) $2.0\ m/s^2$
c) $6.0\ m/s^2$
d) $10\ m/s^2$

___ 21. As the angle between two forces acting on the same point of a body increases, the magnitude of their resultant:

a) increases
b) decreases
c) remains the same
d) may increase or decrease

___ 22. A rock is launched straight up into the air and then returns to its starting point. The total displacement upon landing is

a) equal to the difference between the final velocity and initial velocities divided by the acceleration due to gravity
b) zero
c) equal to its velocity multiplied by time
d) equal to the distance traveled

___ 23. The planet Pluto is orbiting the sun in an elliptical path. As the distance between Pluto and the sun increases, the speed of the orbiting planet will

a) increase
b) decrease
c) remain the same

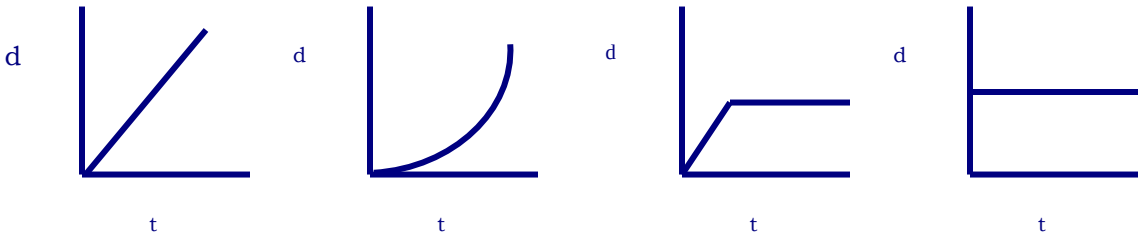
___ 24. The amplitude of a body undergoing simple harmonic motion is:

a) its total range of motion
b) its minimum displacement from its equilibrium position
c) the number of swings per second
d) its maximum displacement from its equilibrium position

___ 25. According to Newton's law of universal gravitation, the force of attraction between any two masses is inversely related to:

a) the velocity of the two masses
b) the square of the distance between the two masses
c) the product of the two masses
d) the sum of the two masses

___ 26. Which graph represents an object moving at a constant velocity for the entire time interval?



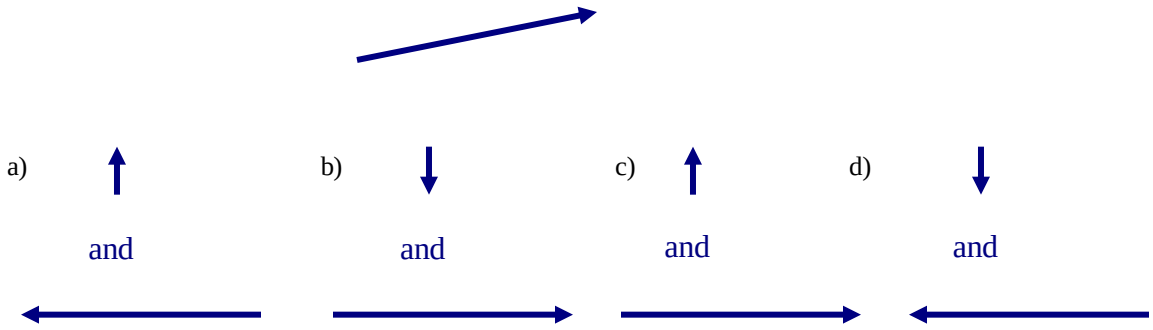
(1) (2) (3) (4)

a) 1
b) 2
c) 3
d) 4

___27. A skydiver jumps out of a plane and falls toward Earth's surface. At some point in his fall, the force of air resistance is equal to the force of gravity acting on him. What is the skydiver doing at this point?

a) accelerating at a constant rate toward Earth's surface
b) accelerating toward Earth's surface, but not at a constant rate
c) accelerating upward, but not at a constant rate
d) falling at a constant velocity

___ 28. If the velocity vector below is resolved into its components, which two vectors represent the components?



___ 29. If the orbital radius of a satellite around the earth decreases, the velocity of the satellite

a) increases
b) decreases
c) remains the same

___ 30. What is the angle between the vectors **A** and **–A** when they are drawn from a common origin?

a) 0^o
b) 90^o
c) 180^o
d) 270^o

___ 31. Ignoring air resistance, if a 10 kg ball and a 200 kg crate were both dropped from the top of the same building, the acceleration of the crate would be ____ the acceleration of the ball.

a) less than
b) equal to
c) greater than

___ 32. When the displacement of an object with simple harmonic motion is the smallest, the acceleration has a

a) maximum value
b) minimum value
c) value between its maximum and minimum values

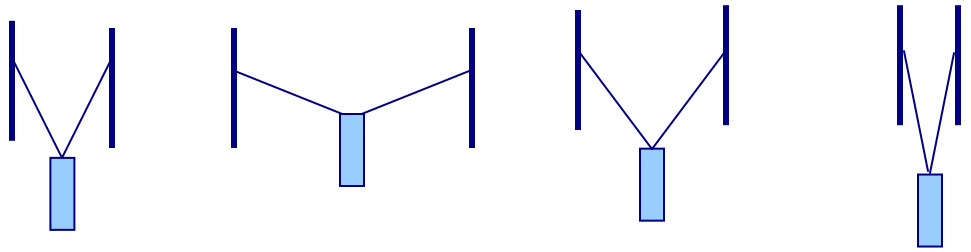
___ 33. According to ____, an imaginary line from the sun to a planet sweeps out equal areas in equal time intervals.

a) Newton's third law of motion
b) Kepler's third law of planetary motion
c) Newton's law of gravitation
d) Kepler's second law of planetary motion

___ 34. On a velocity-time graph, the slope of the tangent to the curve at a given point is the
a) instantaneous acceleration
b) average velocity
c) instantaneous velocity
d) average acceleration

___ 35. The period of a simple pendulum depends upon
a) the mass of the bob
b) the length of the pendulum
c) the stiffness of the pendulum
d) the amplitude of the swing

___ 36. A block of weight W is suspended by a string of fixed length. The ends of the string are held at various positions as shown in the figures below. In which case is the magnitude of the tension along the string the largest?



(a) (b) (c) (d)

___ 37. A direction of 30^o west of north is the same as a direction of

a) 60^o
b) 120^o
c) 290^o
d) 340^o

___ 38. At the surface of the Earth, an object of mass m has weight W. If this object is transported to a distance that is triple the radius of the earth, at the new location
a) its mass is m/2 and its weight is W/2
b) its mass is m and its weight is W/2
c) its mass is m and its weight is W/4
d) its mass is m and its weight is W/9

___ 39. Which factor increases the force of friction acting on an object that is sliding down an incline?
a) increasing the surface area in contact
b) decreasing the surface area in contact
c) lubricating the surfaces in contact
d) decreasing the angle of the incline plane

___ 40. Which car has a westward acceleration?
a) a car traveling westward at a constant speed
b) a car traveling eastward and slowing down
c) a car traveling eastward and speeding up
d) a car traveling westward and slowing down

___ 41. An object in circular motion travels a distance of ___ during its period.
a) v^2/r
b) r
c) πd
d) $4\pi r^2$

___ 42. A planet has eight times the mass of the earth and twice its radius. On the surface of this planet, the acceleration due to gravity is
a) twice that on earth
b) the same as that on earth
c) half that on earth
d) four times that on earth

___43. A 5.0 kg object is resting on a plane that is inclined at 15° to the horizontal. Determine the normal force acting on the object.
a) 189 N
b) 51 N
c) 47 N
d) 13 N

___ 44. A rock is thrown vertically upward from the surface of the earth. The rock rises to some maximum height and falls back toward the surface of the earth. Which statement concerning this situation is true (ignore air resistance)?
a) As the rock rises, its acceleration is in the positive direction.
b) The acceleration of the rock is zero when the rock is at its highest position.
c) The speed of the ball is negative while the rock falls to earth.
d) The rock is a "freely falling body" for the duration of its flight.

___ 45. Satellite X has a mass nine times the mass of Satellite Y. Both are in an orbit that is 250 km above the surface of the earth. Satellite X will have an orbital speed that is ____ satellite Y's.
a) twice that of
b) three times that of
c) four times that of
d) the same as

___ 46. Two masses are separated by a distance, d. If the distance between the two masses changes to 4d, one of the masses doubles and the other mass quadruples, then the gravitational force
a) remains the same
b) is halved
c) triples
d) quadruples

___ 47. In order for velocity to change, there must be
a) a change in speed only
b) a change in direction only
c) a change in either speed or direction
d) a change in both speed and direction

___ 48. A woman has a mass of 60 kg at the earth's surface. At a height of one earth radius above the surface of the earth, her mass is
a) 15 kg
b) 30 kg
c) 60 kg
d) 120 kg

___ 49. Starting from rest, a particle confined to moving along a straight line is accelerated at a rate of 5.0 m/s^2. Which statement concerning the slope of the position versus time graph for this particle is true?

a) It has a constant value of 5.0 m/s.
b) It has a constant value of 5.0 m/s^2.
c) It is not constant and decreases with increasing time.
d) It is not constant and increases with increasing time.

___ 50. A projectile:

a) has no forces acting on it
b) has constant horizontal speed
c) is always projected in just one dimension
d) has no vertical acceleration

Physics 122
Review – Multiple Choice

1. D
2. B
3. omit
4. C
5. D
6. A
7. omit
8. D
9. D
10. omit
11. B
12. A
13. omit
14. A
15. omit
16. B
17. C
18. omit
19. C
20. omit
21. omit
22. B
23. B
24. D
25. B
26. omit
27. omit
28. C
29. A
30. omit
31. omit
32. B
33. D
34. omit
35. B
36. B
37. omit
38. D
39. omit
40. omit
41. C
42. A
43. C
44. D
45. D
46. B
47. C
48. C
49. omit
50. B