Phy101 Midterm Preparation file No:01

Lecture No:01-22

Youtube:Life Star Academy

By Rj Afzal

1. **Power is equal to the dot product of force and**

a. **Position vector**
b. **Displacement**
c. **Velocity**
d. **Acceleration**

2. **The frequency which is not audible for human ear is**

a. **50000Hz**
b. **500Hz**
c. **5000Hz**
d. **50Hz**

3. **A Wheel of radius 50cm having the angular speed of 5rad/s will have linear speed in m/s?**

a. **1.5**
b. **2.5**
c. **3.5**
d. **0.5**

4. **When breaks are applied to a fast moving car, the passenger will be throws:**

a. **Backward**
b. **Forward**
c. **Upward**
d. **downward**

5. **Stress can be measured**

a. **N.m**
b. **N/m^2**
c. **Nm^2**
d. **N/m**

6. **A heavy particle moving with 5m/s suffers an elastic collision with a light particle at rest.After collision,the velocity of light particle will be:**

a. **10m/s**
b. **2.5m/s**
c. **20m/s**
d. **5m/s**

7) **Acceleration in a body is always produced in the direction of:**

a. **Velocity**
b. **Weight**
c. **Acceleration**
d. **Force**

8) The fundamental dimensions of angular momentum are:

a. **ML-2T-2**
b. **ML2T-1**
c. **ML2T-2**
d. **MLT-1**

9) Ali wants to lift a mass of 7.5kg with constant velocity by a rope that passes throw a frictionless pulley which is attached to the ceiling of room. Calculate the tension in rope by neglecting the mass of the rope.

a. **75N**
b. **7.5kg**
c. **75kg**
d. **0.75N**

10) The first condition of equilibrium implies that:

a. **∑FY=0**
b. **∑FX=∑FY**
c. **∑F=0**
d. **∑FX=0**

11) Final take off velocity of an airplane is 67m/s. The length of runway 2km, the constant acceleration is :

a. **3.24ms^-1**
b. **3.24ms^-2**
c. **2.24ms^-2**
d. **2.24ms^-1**

12) The ultimate strength of a sample is the stress at which the sample :

a. **Remains under water**
b. **Breaks**
c. **Bends 180**
d. **Returns to its original shape**

13) The area under the velocity time graph is:

a. Acceleration
b. Torque
c. Distance
d. Force

14) If you travelled for 25hours with an average speed 48miles/hours, the distance travelled is:

a. 19.2miles
b. 120miles
c. 300miles
d. 48miles

15) A fire whistle emits a tone of 170Hz,Take the speed of sound in air to be 340m/s. The wavelength of this sound is about:

a. 1.0m
b. 2.0m
c. 0.5m
d. 3.0m

16) Motion defines by the pair of variables:

a. Speed and passage of time
b. Speed and distance
c. Change of position and passage of time

17) The law of inertia was firstly formulated by:

a. Newton
b. Galileo
c. Einstein
d. Aristotle

18) When the velocity of an aeroplane is doubled, the momentum

a. Is conserved
b. Becomes Zero
c. Increases uniformly
d. Remains unchanged

19) As we move above, the body the surface of the earth the change in potential energy will be:

a. Infinity
b. Positive
c. Zero
d. Negative

20) The lowest tone produced by a certain organ comes from a 3.0-m pipe with both ends open. If the speed of sound is 340m/s, the frequency of this tone is approximately:

A. 7Hz

B. 14 Hz

C. 28 Hz

D. 57 Hz page no 53

21) To raise the pitch of a certain piano string, the piano tuner

A. loosens the string

B. tightens the string

C. shortens the string page no 54

D. lengthens the string

22) A force of 5000N is applied outwardly to each end of a 5.0-m long rod with a radius of 34.0 cm and a Young's modulus of 125 × 108 N/m2. The elongation of the rod is:

A. 0.0020mm

B. 0.0040mm

C. 0.14mm

D. 0.55mm

23) A particle oscillating in simple harmonic motion is:

A. never in equilibrium because it is in motion

B. never in equilibrium because there is always a force

C. in equilibrium at the ends of its path because its velocity is zero there

D.in equilibrium at the center of its path because the acceleration is zero there

24) In simple harmonic motion, the restoring force must be proportional to the:

A. amplitude

B. frequency

C.velocity

D. displacement

page no:44 Reference: Now we have a restoring force that is proportional to the distance away from the equilibrium point

25) A 160-N child sits on a light swing and is pulled back and held with a horizontal force of 100 N. The magnitude of the tension force of each of the two supporting ropes is:

A. 60N

B. 94N

C.120N

D. 190N

26) An object attached to one end of a spring makes 20 vibrations in 10 s. Its angular frequency is:

A. 12.6 rad/s

B. 1.57 rad/s

C. 2.0 rad/s

D. 6.3 rad/s

Reference: Page no 42 V=20 , t=10 Ω=2.pie.v =2*3.14*20=125.6(1/t)=12.6rad/sec

27) For an object in equilibrium the net torque acting on it vanishes only if each torque is calculated about:

A. the center of mass

B. the center of gravity

C. the geometrical center

D. the same point

28) Ten seconds after an electric fan is turned on, the fan rotates at 300 rev/min. Its average angular acceleration is:

C.30 rev/s2

Reference: Page no 28 Avg angular acceleration=(final angular velocity-intial angular velocity)/time =(300-0)/10=30rev/s2

29) A 4.0-N puck is traveling at 3.0m/s. It strikes a 8.0-N puck, which is stationary. The two pucks stick together. Their common final speed is:

A.1.0m/s

B.1.5m/s

C.2.0m/s

D.2.3m/s

Reference: The case you're describing is called an inelastic collision.

30) Two objects collide, stick to each other and continue their motion as one body. Due to momentum conservation principle, sum of two bodies momenta before collision has to be equal to momentum of the one body after collision.

B before = p first + p second = m1v1 + m2v2 p after = (m1 + m2)v common

Since p before = p after, (m1 + m2)v common = m1v1 + m2v2

We can get v common from that: v common = (m1v1 + m2v2) / (m1 + m2)

31) An object moving in a circle at constant speed

D.has an acceleration of constant magnitude

Reference: Page no: 29

32) Now consider a particle going around a circle at constant speed. You might think that constant speed means no acceleration. Bu this is wrong! It is changing its direction and accelerating. This is called "centripetal acceleration", meaning acceleration directed towards the centre of the circle plane traveling north at 200m/s turns and then travels south at 200m/s. The change in its velocity is:

B.400m/s south

Reference:400 m/s south because it need 200 to overcome the 200 north then another 200 to get going 200 south.

33) At time t = 0 a car has a velocity of 16 m/s. It slows down with an acceleration given by −0.50t, in m/s2 for t in seconds. It stops at t =

A. 64 s

B. 32 s

C.16 s

D. 8.0 s

Reference: Vf=vi+at Vf=16-0.50t(0) Vf=16 As we know a=final velocity/t And t=final velocity/a 16/.5 = t 32 = t

34) 1 mi is equivalent to 1609 m so 55 mph is:

A. 15 m/s

B.25 m/s

C. 66 m/s

D. 88 m/s

Refernce:1 mile = 1609 meters or 1.609 kilometers

so,

55 miles = 1609x55 = 88495 meters or 88.495 kilometers

35) The number of significant figures in 0.00150 is:

C.3

37) One revolution is the same as:

A. 1 rad

B. 57 rad

C. π/2 rad

D. π rad

E.2π rad

38) For a body to be in equilibrium under the combined action of several forces:

A. all the forces must be applied at the same point all the forces must be applied at the same point

B. all of the forces form pairs of equal and opposite forces

C. any two of these forces must be balanced by a third force

D.the sum of the torques about any point must equal zero

39) As a 2.0-kg block travels around a 0.50-m radius circle it has an angular speed of 12 rad/s. The circle is parallel to the xy plane and is centered on the z axis, a distance of 0.75m from the origin. The z component of the angular momentum around the origin is:

A. 6.0kg · m2/s

B.9.0kg · m2/s

C.11 kg · m2/s

D.14 kg · m2/s

40) A net torque applied to a rigid object always tends to produce:

A. rotational equilibrium

B.linear acceleration

C.angular acceleration

D.rotational inertia

41) object attached to one end of a spring makes 20 vibrations in 10 s. Its angular frequency is:

A.2.0 rad/s

B. 12.6 rad/s

C.1.57 rad/s

D.6.3 rad/s

42) In simple harmonic motion, the restoring force must be proportional to the:

A.displacement

B.amplitude

C. frequency

D.velocity

43) Mercury is a convenient liquid to use in a barometer because:

A. it has a high density

B. it is a metal

C.it has a high boiling point

D. it expands little with temperature

44) The units of the electric field are

A. J/m

B. J/(C·m)

C. J/C

D. J·C

45) A farad is the same as a

A. J/V

B. V/J

C. C/V

D.V/C

46) The wavelength of red light is 700 nm. Its frequency is _____.

A. 4.30 * 105 Hertz

47) Which of the following statements is NOT TRUE about electromagnetic waves?

A. The electromagnetic radiation from a burning candle is unpolarized.

48) Radio waves and light waves are _____.

A. Electromagnetic and transverse both

B. longitudinal waves

C. Transverse waves

D. Electromagnetic and transverse both

E. Electromagnetic and longitudinal both

49) Fahrenheit and Kelvin scales agree numerically at a reading of:

A. -40

50) According to the theory of relativity:

A. moving clocks run fast

51) Light from a stationary spaceship is observed, and then the spaceship moves directly away from the observer at high speed while still emitting the light. As a result, the light seen by the observer has:

D. lower frequency and a longer wavelength than before

52) How fast should you move away from a 6.0 × 1014 Hz light source to observe waves with a frequency of 4.0 × 1014 Hz?

A. 38c

53) The quantum number n is most closely associated with what property of the electron in a hydrogen atom?

A. Energy

B. Orbital angular momentum

C. Spin angular momentum

D. Magnetic moment

54) The quantum number ms is most closely associated with what property of the electron in an atom?

A. Energy

B. Magnitude of the orbital angular momentum

C. z component of the spin angular momentum

D. z component of the orbital angular momentum

55) As the wavelength of a wave in a uniform medium increases, its speed will _____.

A. Remain the same

B. Decrease

C. Increase

D. Remain the same

E. None of these

56) Velocity is defined as:

A. rate of change of position with time

B. position divided by time

C. rate of change of acceleration with time

D. a speeding up or slowing down

57) Acceleration is defined as:

A. rate of change of position with time

B. speed divided by time

C. rate of change of velocity with time

D. a speeding up or slowing down

58) Which of the following is a scalar quantity?

A. Speed

B. Velocity

C. Displacement

D. Acceleration

59) Which of the following is a vector quantity?

A. Mass

B. Density

C. Speed

D. Temperature

E. None of these

60) Which of the following is NOT an example of accelerated motion?

A. Vertical component of projectile motion

B. Circular motion at constant speed

C. A swinging pendulum

D. Earth's motion about sun

E. Horizontal component of projectile motion

61) A particle goes from x = −2m, y =3m, z =1mto x =3m, y = −1m, z = 4m. Its displacement is:

A. (1m)ˆi + (2m)ˆj + (5m) ˆk

B. (5m)ˆi −(4m)ˆj + (3m) ˆk

C. −(5m)ˆi + (4m)ˆj −(3m) ˆk

D. −(1m)ˆi −(2m)ˆj −(5m) ˆk

62) A jet plane in straight horizontal flight passes over your head. When it is directly above you, the sound seems to come from a point behind the plane in a direction 30◦ from the vertical. The speed of the plane is:

A. the same as the speed of sound

B. half the speed of sound

C. three-fifths the speed of sound

D. 0.866 times the speed of sound

63) A plane traveling north at 200m/s turns and then travels south at 200m/s. The change in its velocity is:

A. zero

B. 200m/s north

C. 200m/s south

D. 400m/s north

E. 400m/s south

64) Two bodies are falling with negligible air resistance, side by side, above a horizontal plane. If one of the bodies is given an additional horizontal acceleration during its descent, it

A. strikes the plane at the same time as the other body

B. strikes the plane earlier than the other body

C. has the vertical component of its velocity altered D. has the vertical component of its acceleration altered

65) The velocity of a projectile equals its initial velocity added to: A. a constant horizontal velocity

B. a constant vertical velocity

C. a constantly increasing horizontal velocity

D. a constantly increasing downward velocity

66) A stone thrown from the top of a tall building follows a path that is:

A. circular

B. made of two straight line segments

C. hyperbolic

D. parabolic

67) Identical guns fire identical bullets horizontally at the same speed from the same height above level planes, one on the Earth and one on the Moon. Which of the following three statements is/are true?

I. The horizontal distance traveled by the bullet is greater for the Moon.

II. The flight time is less for the bullet on the Earth.

III. The velocity of the bullets at impact are the same.

A. III only

B. I and II only

C. I and III only

D. II and III only

68) A stone is thrown horizontally and follows the path XYZ shown. The direction of the acceleration of the stone at point Y is:

A. ↓

B. →

C. 9

D. t

69) A bullet shot horizontally from a gun:

A. strikes the ground much later than one dropped vertically from the same point at the same instant

B. never strikes the ground

C. strikes the ground at approximately the same time as one dropped vertically from the same point at the same instant

D. travels in a straight line

E. strikes the ground much sooner than one dropped from the same point at the same instant

70) A bomber flying in level flight with constant velocity releases a bomb before it is over the target. Neglecting air resistance, which one of the following is NOT true?

A. The bomber is over the target when the bomb strikes

B. The acceleration of the bomb is constant

C. The horizontal velocity of the plane equals the vertical velocity of the bomb when it hits the target

D. The bomb travels in a curved path

E. The time of flight of the bomb is independent of the horizontal speed of the plane

71) An object is shot from the back of a railroad flatcar moving at 40km/h on a straight horizontal road. The launcher is aimed upward, perpendicular to the bed of the flatcar. The object falls:

A. in front of the flatcar

B. behind the flatcar

C. on the flatcar

D. either behind or in front of the flatcar, depending on the initial speed of the object

E. to the side of the flatcar

72) A ball is thrown horizontally from the top of a 20-m high hill. It strikes the ground at an angle of 45◦. With what speed was it thrown?

A. 14m/s

B. 20m/s

C. 28m/s

73) The SI standard of time is based on:

A. the daily rotation of the earth

B. the frequency of light emitted by Kr86

C. the yearly revolution of the earth about the sun

D. a precision pendulum clock

E. none of these

74) A nanosecond is:

A. 109 s

B. 10−9 s

C. 10−10 s

D. 10−10 s

E. 10−12

75) The SI standard of length is based on:

A. the distance from the north pole to the equator along a meridian passing through Paris

B. wavelength of light emitted by Hg198

C. wavelength of light emitted by Kr86

D. a precision meter stick in Paris

E. the speed of light

76) In 1866, the U. S. Congress defined the U. S. yard as exactly 3600/3937 international meter. This was done primarily because:

A. length can be measured more accurately in meters than in yards

B. the meter is more stable than the yard

C. this definition relates the common U. S. length units to a more widely used system

D. there are more wavelengths in a yard than in a meter

77) Which of the following is closest to a yard in length?

A. 0.01m

B. 0.1m

C. 1m

D. 100m

78) There is no SI base unit for area because:

A. an area has no thickness; hence no physical standard can be built

B. we live in a three (not a two) dimensional world

C. it is impossible to express square feet in terms of meters

D. area can be expressed in terms of square meters

79) The SI base unit for mass is:

A. gram

B. pound

C. kilogram

D. ounce

80) A gram is:

A. 10−6 kg

B. 10−3 kg

C. 1 kg

D. 103 kg

82) Which of the following weighs about a pound?

A. 0.05 kg

B. 0.5 kg

C. 5 kg

D. 50 kg

83) (5.0×104)×(3.0×106)=

A. 1.5×109

B. 1.5×1010

C. 1.5×1011

D. 1.5×1012

84) (5.0×104)×(3.0×10−6)=

A. 1.5×10−3

B. 1.5×10−1

C. 1.5×101

D. 1.5×103

85) 5.0×105 +3 .0×106 =

A. 8.0×105

B. 8.0×106

C. 5.3×105

D. 3.5×105

E. 3.5×106

86) (7.0×106)/(2.0×10−6)=

A. 3.5×10−12

B. 3.5×10−6

C. 3.5

D. 3.5×106

E. 3.5×1012

87) The number of significant figures in 0.00150 is:

A. 2

B. 3

C. 4

D. 5

88) The number of significant figures in 15.0 is:

A. 1

B. 2

C. 3

D. 4

89) 3.2×2.7=

A. 9

B. 8

C. 8.6

D. 8.64

90) 1.513 + 27.3=

A. 29

B. 28.8

C. 28.9

D. 28.81

91) 1 mi is equivalent to 1609 m so 55 mph is:

A. 15 m/s

B. 25 m/s

C. 66 m/s

D. 88 m/s

92) A sphere with a radius of 1.7 cm has a volume of:

A. 2.1×10^{-5} m3

B. 9.1×10^{-4} m3

C. 3.6×10^{-3} m3

D. 0.11 m3

93) A sphere with a radius of 1.7 cm has a surface area of:

A. 2.1×10−5 m2

B. 9.1×10−4 m2

C. 3.6×10−3 m2

D. 0.11 m2

94) A right circular cylinder with a radius of 2.3 cm and a height of 1.4 m has a volume of:

A. 0.20 m3

B. 0.14 m3

C. 9.3×10−3 m3

D. 2.3×10−3 m3

95) A right circular cylinder with a radius of 2.3 cm and a height of 1.4 cm has a total surface area of:

A. 1.7×10−3 m2

B. 3.2×10−3 m2

C. 2.0×10−3 m3

D. 5.3×10−3 m2

96) A cubic box with an edge of exactly 1 cm has a volume of:

A. 10−9 m3

B. 10−6 m3

C. 10−3 m3

97) A square with an edge of exactly 1 cm has an area of:

A. 10−6 m2

B. 10−4 m2

C. 102 m2

D. 104 m2

98) 1 m is equivalent to 3.281 ft. A cube with an edge of 1.5 ft has a volume of:

A. 1.2×102 m3

B. 9.6×10−2 m3

C. 10.5m 3

D. 9.5×10−2 m3

99) During a short interval of time the speed v in m/s of an automobile is given by v = at2 + bt3, where the time t is in seconds. The units of a and b are respectively:

A. m·s2;m·s4

B. s3/m; s4/m

C. m/s2;m /s3

D. m/s3;m /s4

100) Suppose A = BC, where A has the dimension L/M and C has the dimension L/T. Then B has the dimension:

A. T/M

B. L2/TM

C. TM/L2

D. L2T/M

101) Suppose A = BnCm, where A has dimensions LT, B has dimensions L2T−1, and C has dimensions LT2. Then the exponents n and m have the values:

A. 2/3; 1/3

B. 2; 3

C. 4/5; −1/5

D. 1/5; 3/5

102) A particle moves along the x axis from xi to xf. Of the following values of the initial and final coordinates, which results in the displacement with the largest magnitude?

A. xi = 4m,xf =6m

B. xi = −4m,xf = −8m

C. xi = −4m,xf =2m

D. xi = 4m,xf = −2m

E. xi = −4m,xf =4m

103) A particle moves along the x axis from xi to xf. Of the following values of the initial and final coordinates, which results in a negative displacement?

A. xi = 4m,xf =6m

B. xi = −4m,xf = −8m

C. xi = −4m,xf =2m

D. xi = −4m,xf = −2m

104) The average speed of a moving object during a given interval of time is always:

A. the magnitude of its average velocity over the interval

B. the distance covered during the time interval divided by the time interval

C. one-half its speed at the end of the interval

D . its acceleration multiplied by the time interval

105) Two automobiles are 150 kilometers apart and traveling toward each other. One automobile is moving at 60km/h and the other is moving at 40km/h mph. In how many hours will they meet?

A. 2.5

B. 2.0

C. 1.75

D. 1.5

106) A car travels 40 kilometers at an average speed of 80km/h and then travels 40 kilometers at an average speed of 40km/h. The average speed of the car for this 80-km trip is:

A. 40km/h

B. 45km/h

C. 48km/h

D. 53km/h

107) A car starts from Hither, goes 50 km in a straight line to Yon, immediately turns around, and returns to Hither. The time for this round trip is 2 hours. The magnitude of the average velocity of the car for this round trip is:

A. 0

B. 50 km/hr

C. 100 km/hr

D. 200 km/hr

108) A car starts from Hither, goes 50 km in a straight line to Yon, immediately turns around, and returns to Hither. The time for this round trip is 2 hours. The average speed of the car for this round trip is: A. 0

B. 50 km/h

C. 100 km/h

D. 200 km/h

110) The coordinate of a particle in meters is given by x(t) = 16 t −3.0t3, where the time t is inseconds. The particle is momentarily at rest at t =

A. 0.75s

B. 1.3s

C. 5.3s

D. 7.3s

111) A drag racing car starts from rest at t = 0 and moves along a straight line with velocity given by v = bt2, where b is a constant. The expression for the distance traveled by this car from its position at t = 0 is:

A. bt3

B. bt3/3

C. 4bt2

D. 3bt2

112) A ball rolls up a slope. At the end of three seconds its velocity is 20 cm/s; at the end of eight seconds its velocity is 0. What is the average acceleration from the third to the eighth second?

A. 2.5cm/s2

B. 4.0cm/s2

C. 5.0cm/s2

D. 6.0cm/s2

113) The coordinate of an object is given as a function of time by x =7 t−3t2, where x is in metersand t is in seconds. Its average velocity over the interval from t = 0 tot = 4s is:

A. 5m/s

B. −5m/s

C. 11m/s

D. −11m/s

114) The velocity of an object is given as a function of time by v =4 t−3t2, where v is in m/s andt is in seconds. Its average velocity over the interval from t = 0 tot = 2s:

A. is 0

B. is −2m/s

C. is 2m/s

D. is −4m/s

115) The coordinate of an object is given as a function of time by x =4 t2−3t3, where x is in metersand t is in seconds. Its average acceleration over the interval from t = 0 tot = 2s is:

A. −4m/s2

B. 4m/s2

C. −10m/s2

D. 10m/s2

116) Each of four particles move along an x axis. Their coordinates (in meters) as functions of time (in seconds) are given by particle 1: x(t)=3 .5−2.7t3particle 2: x(t)=3 .5+2 .7t3 particle 3: x(t)=3 .5+2 .7t2 particle 4: x(t)=3 .5−3.4t−2.7t2 Which of these particles have constant acceleration?

A. All four

B. Only 1 and 2

C. Only 2 and 3

D. Only 3 and 4

117) Each of four particles move along an x axis. Their coordinates (in meters) as functions of time (in seconds) are given by particle 1: x(t)=3 .5−2.7t3particle 2: x(t)=3 .5+2 .7t3 particle 3: x(t)=3 .5+2 .7t2 particle 4: x(t)=3 .5−3.4t−2.7t2 Which of these particles is speeding up for t>0?

A. All four

B. Only 1

C. Only 2 and 3

D. Only 2, 3, and 4

118) An object starts from rest at the origin and moves along the x axis with a constant acceleration of 4m/s2. Its average velocity as it goes from x = 2m tox = 8m is:

A. 1m/s

B. 2m/s

C. 3m/s

D. 5m/s

E. 6m/s

119) Of the following situations, which one is impossible?

A. A body having velocity east and acceleration east

B. A body having velocity east and acceleration west

C. A body having zero velocity and non-zero acceleration

D. A body having constant acceleration and variable velocity

E. A body having constant velocity and variable acceleration

120) Throughout a time interval, while the speed of a particle increases as it moves along the x axis, its velocity and acceleration might be:

A. positive and negative, respectively

B. negative and positive, respectively

C. negative and negative, respectively

D. negative and zero, respectively

121) A particle moves on the x axis. When its acceleration is positive and increasing:

A. its velocity must be positive

B. its velocity must be negative

C. it must be slowing down

D. it must be speeding up

E. none of the above must be true

122) The position y of a particle moving along the y axis depends on the time t according to the equation y = at−bt2. The dimensions of the quantities a and b are respectively:

A. L2/T, L3/T2

B. L/T2,L 2/T

C. L/T, L/T2

D. L3/T, T2/L

123) A particle moves along the x axis according to the equation x =6 t2, where x is in meters and t is in seconds. Therefore:

A. the acceleration of the particle is 6 m/s2

B. t cannot be negative

C. the particle follows a parabolic path

D. each second the velocity of the particle changes by 9.8 m/s

E. none of the above

124) Over a short interval near time t = 0 the coordinate of an automobile in meters is given by x(t) = 27 t−4.0t3, where t is in seconds. At the end of 1.0 s the acceleration of the auto is:

A. 27 m/s2

B. 4.0 m/s2

C. −4.0 m/s2

D. −12 m/s2

E. −24 m/s2

125) Over a short interval, starting at time t = 0, the coordinate of an automobile in meters is given by x(t) = 27 t−4.0t3, where t is in seconds. The magnitudes of the initial (at t = 0) velocity and acceleration of the auto respectively are:

A. 0; 12 m/s2

B. 0; 24 m/s2

C. 27 m/s; 0

D. 27 m/s; 12 m/s2

126) At time t = 0 a car has a velocity of 16 m/s. It slows down with an acceleration given by −0.50t, in m/s2 for t in seconds. It stops at t =

A. 64 s

B. 32 s

C. 16 s

D. 8.0s

127) At time t = 0 a car has a velocity of 16 m/s. It slows down with an acceleration given by −0.50t, in m/s2 for t in seconds. At the end of 4.0 s it has traveled:

A. 0

B. 12 m

C. 14 m

D. 25 m

E. 59 m

128) At time t = 0 a car has a velocity of 16 m/s. It slows down with an acceleration given by −0.50t, in m/s2 for t in seconds. By the time it stops it has traveled:

A. 15 m

B. 31 m

C. 62 m

D. 85 m

129) Starting at time t = 0, an object moves along a straight line with velocity in m/s given by v(t) = 98−2t2, where t is in seconds. When it momentarily stops its acceleration is:

A. 0

B. −4.0 m/s2

C. −9.8 m/s2

D. −28 m/s2

130) Starting at time t = 0, an object moves along a straight line. Its coordinate in meters is given by x(t) = 75 t−1.0t3, where t is in seconds. When it momentarily stops its acceleration is:

A. 0

B. −73 m/s2

C. −30 m/s2

D. −9.8 m/s2

131) A car, initially at rest, travels 20 m in 4 s along a straight line with constant acceleration. The acceleration of the car is:

A. 0.4m/s2

B. 1.3m/s2

C. 2.5m/s2

D. 4.9m/s2

132) A racing car traveling with constant acceleration increases its speed from 10m/s to 50m /s over a distance of 60m. How long does this take?

A. 2.0s

B. 4.0s

C. 5.0s

D. 8.0s

133) A car starts from rest and goes down a slope with a constant acceleration of 5 m/s2. After 5 s the car reaches the bottom of the hill. Its speed at the bottom of the hill, in meters per second, is:

A. 1

B. 12.5

C. 25

D. 50

134) A car moving with an initial velocity of 25 m/s north has a constant acceleration of 3 m/s2 south. After 6 seconds its velocity will be:

A. 7 m/s north

B. 7 m/s south

C. 43 m/s north

D. 20 m/s north

135) An object with an initial velocity of 12 m/s west experiences a constant acceleration of 4 m/s2 west for 3 seconds. During this time the object travels a distance of:

A. 12 m

B. 24 m

C. 36 m

D. 54 m

136) How far does a car travel in 6 s if itsinitial velocity is 2 m/s and its acceleration is 2 m/s2 in the forward direction?

A. 12 m

B. 14 m

C. 24 m

D. 36 m

E. 48 m

137) At a stop light, a truck traveling at 15 m/s passes a car as it starts from rest. The truck travels at constant velocity and the car accelerates at 3 m/s2. How much time does the car take to catch up to the truck?

A. 5s

B. 10s

C. 15s

D. 20s

138) A ball is in free fall. Its acceleration is:

A. downward during both ascent and descent

B. downward during ascent and upward during descent

C. upward during ascent and downward during descent

D. upward during both ascent and descent

139) A ball is in free fall. Upward is taken to be the positive direction. The displacement of the ball during a short time interval is:

A. positive during both ascent and descent

B. negative during both ascent and descent

C. negative during ascent and positive during descent

D. positive during ascent and negative during descent

140) Which one of the following statements is correct for an object released from rest?

A. The average velocity during the first second of time is 4.9m/s

B. During each second the object falls 9.8m

C. The acceleration changes by 9.8m/s2 every second

D. The object falls 9.8m during the first second of time

141) A freely falling body has a constant acceleration of 9.8 m/s2. This means that:

A. the body falls 9.8 m during each second

B. the body falls 9.8 m during the first second only

C. the speed of the body increases by 9.8 m/s during each second

D. the acceleration of the body increases by 9.8 m/s2 during each second

142) An object is shot vertically upward. While it is rising:

A. its velocity and acceleration are both upward

B. its velocity is upward and its acceleration is downward

C. its velocity and acceleration are both downward

D. its velocity is downward and its acceleration is upward

143) An object is thrown straight up from ground level with a speed of 50 m/s. If g = 10 m/s2 its distance above ground level 1.0 s later is:

A. 40 m

B. 45 m

C. 50 m

D. 55 m

144) An object is thrown straight up from ground level with a speed of 50 m/s. If g = 10 m/s2 its distance above ground level 6.0 s later is:

A. 0.00 m

B. 270 m

C. 330 m

D. 480 m

E. none of these

145) At a location where g =9 .80 m/s2, an object is thrown vertically down with an initial speed of 1.00 m/s. After 5.00 s the object will have traveled:

A. 125 m

B. 127.5m

C. 245 m

D. 250 m

146) An object is thrown vertically upward at 35 m/s. Taking g = 10 m/s2, the velocity of the object 5 s later is:

A. 7.0 m/s up

B. 15 m/s down

C. 15 m/s up

D. 85 m/s down

147) A feather, initially at rest, is released in a vacuum 12 m above the surface of the earth. Which of the following statements is correct?

A. The maximum velocity of the feather is 9.8 m/s

B. The acceleration of the feather decreases until terminal velocity is reached

C. The acceleration of the feather remains constant during the fall

D. The acceleration of the feather increases during the fall

148) An object is released from rest. How far does it fall during the second second of its fall?

A. 4.9m

B. 9.8m

C. 15m

D. 20m

149) A heavy ball falls freely, starting from rest. Between the third and fourth second of time it travels a distance of:

A. 4.9m

B. 9.8m

C. 29.4m

D. 34.3m

150) As a rocket is accelerating vertically upward at 9.8 m/s2 near Earth's surface, it releases a projectile. Immediately after release the acceleration (in m/s2) of the projectile is:

A. 9.8 down

B. 0

C. 9.8 up

D. 19.6 up

151) A stone is released from a balloon that is descending at a constant speed of 10 m/s. Neglecting air resistance, after 20 s the speed of the stone is:

A. 2160 m/s

B. 1760 m/s

C. 206 m/s

D. 196 m/s

152) An object dropped from the window of a tall building hits the ground in 12.0 s. If its acceleration is 9.80 m/s2, the height of the window above the ground is:

A. 29.4m

B. 58.8m

C. 118 m

D. 353 m

E. 706 m

153) Neglecting the effect of air resistance a stone dropped off a 175-m high building lands on the ground in:

A. 3 s

B. 4 s

C. 6 s

D. 18 s

154) A stone is thrown vertically upward with an initial speed of 19.5 m/s. It will rise to a maximum height of:

A. 4.9m

B. 9.8m

C. 19.4m

D. 38.8m

155) A baseball is hit straight up and is caught by the catcher 2.0 s later. The maximum height of the ball during this interval is:

A. 4.9m

B. 7.4m

C. 9.8m

D. 12.6m

156) An object is thrown straight down with an initial speed of 4 m/s from a window which is 8 m above the ground. The time it takes the object to reach the ground is:

A. 0.80 s

B. 0.93 s

C. 1.3s

D. 1.7s

157) A stone is released from rest from the edge of a building roof 190 m above the ground. Neglecting air resistance, the speed of the stone, just before striking the ground, is:

A. 43 m/s

B. 61 m/s

C. 120 m/s

D. 190 m/s

158) An object is thrown vertically upward with a certain initial velocity in a world where the acceleration due to gravity is 19.6 m/s2. The height to which it rises is that to which the object would rise if thrown upward with the same initial velocity on the Earth. Neglect friction.

A. half

B. √2 times

C. twice

D. four times

159) A projectile is shot vertically upward with a given initial velocity. It reaches a maximum height of 100 m. If, on a second shot, the initial velocity is doubled then the projectile will reach a maximum height of:

A. 70.7m

B. 141.4m

C. 200 m

D. 241 m

E. 400 m

160) One object is thrown vertically upward with an initial velocity of 100 m/s and another object with an initial velocity of 10 m/s. The maximum height reached by the first object will be that of the other.

A. 10 times

B. 100 times

C. 1000 times

D. 10,000 times

161) The area under a velocity-time graph represents:

A. acceleration

B. change in acceleration

C. speed

D. change in velocity

E. displacement

162) Displacement can be obtained from:

A. the slope of an acceleration-time graph

B. the slope of a velocity-time graph

C. the area under an acceleration-time graph

D. the area under a velocity-time graph

163) An object has a constant acceleration of 3 m/s2. The coordinate versus time graph for this object has a slope:

A. that increases with time

B. that is constant

C. that decreases with time

D. of 3 m/s

164) The coordinate-time graph of an object is a straight line with a positive slope. The object has:

A. constant displacement

B. steadily increasing acceleration

C. steadily decreasing acceleration

D. constant velocity

165) We say that the displacement of a particle is a vector quantity. Our best justification for this assertion is:

A. displacement can be specified by a magnitude and a direction
B. operating with displacements according to the rules for manipulating vectors leads to results in agreement with experiments
C. a displacement is obviously not a scalar
D. displacement can be specified by three numbers

166) A vector of magnitude 3 CANNOT be added to a vector of magnitude 4 so that the magnitude of the resultant is:

A. zero
B. 1
C. 3
D. 5

167) A vector of magnitude 20 is added to a vector of magnitude 25. The magnitude of this sum might be:

A. zero
B. 3
C. 12
D. 47

168) A vector of magnitude 3 CANNOT be added to a vector of magnitude 4 so that the magnitude of the resultant is:

A. zero
B. 1
C. 3
D. 5

169) A vector of magnitude 20 is added to a vector of magnitude 25. The magnitude of this sum might be:

A. zero
B. 3
C. 12
D. 47

170) A vector of magnitude 3 CANNOT be added to a vector of magnitude 4 so that the magnitude of the resultant is:

A. zero
B. 1
C. 3
D. 5

171) A vector of magnitude 20 is added to a vector of magnitude 25. The magnitude of this sum might be:

A. zero
B. 3

C. 12
D. 47
172) Vectors A and B lie in the xy plane. We can deduce that A = B if:
A. A2 x + A2 y = B2 x + B2 y
B. Ax + Ay = Bx + By
C. Ax = Bx and Ay = By
D. Ay/Ax = By/Bx E.
173) A vector has a magnitude of 12. When its tail is at the origin it lies between the positive x axis and the negative y axis and makes an angle of 30◦ with the x axis. Its y component is:
A. 6/√3
B. −6√3
C. 6
D. −6
174) If the x component of a vector A, in the xy plane, is half as large as the magnitude of the vector, the tangent of the angle between the vector and the x axis is:
A. √3
B. 1/2
C. √3/2
D. 3/2
175) If A = (6m)ˆ i−(8m)ˆj then 4 A has magnitude:
A. 10m
B. 20m
C. 30m
D. 40m
176) A vector has a component of 10m in the +x direction, a component of 10m in the +y direction, and a component of 5m in the +z direction. The magnitude of this vector is:
A. zero
B. 15m
C. 20m
D. 25m
177) Let V = (2 .00m)ˆi + (6 .00m)ˆ j−(3.00m)ˆk. The magnitude of V is:
A. 5.00m
B. 5.57m
C. 7.00m
D. 7.42m
178) A vector in the xy plane has a magnitude of 25m and an x component of 12m. The angle it makes with the positive x axis is:
A. 26◦
B. 29◦
C. 61◦
D. 64◦
179) The angle between A = (25m)ˆi + (45m)ˆj and the positive x axis is:

A. 29◦

B. 61◦

C. 151◦

D. 209◦

180) The angle between A =(−25m)^i + (45m)^j and the positive x axis is:

A. 29◦

B. 61◦

C. 119◦

D. 151◦

181) Let A = (2m)^i+(6m)^ j−(3m)^k and B = (4m)^i+(2m)^j+(1m)^k. The vector sum S = A+ B is:

A. (6m)^i + (8m)^ j−(2m)^ k

B. (−2m)^i + (4m)^ j−(4m)^ k

C. (2m)^ i−(4m)^j + (4m)^ k

D. (8m)^i + (12m)^ j−(3m)^ k

182) Let A = (2m) ^ i + (6m)^ j − (3m)^k and B = (4m) ^ i + (2m^j + (1m)^k. The vector difference D = A− B is:

A. (6m)^i + (8m)^ j−(2m)^ k

B. (−2m)^i + (4m)^ j−(4m)^ k

C. (2m)^ i−(4m)^j + (4m)^ k

D. (8m)^i + (12m)^ j−(3m)^ k

183) If A = (2m)^ i−(3m)^j and B = (1m)^ i−(2m)^j, then A−2 B =

A. (1m)^ j

B. (−1m)^ j

C. (4m)^ i−(7m)^ j

D. (4m)^i + (1m)^ j

184) A certain vector in the xy plane has an x component of 4m and a y component of 10m. It is then rotated in the xy plane so its x component is doubled. Its new y component is about:

A. 20m

B. 7.2m

C. 5.0m

D. 4.5m

185) Vectors A and B each have magnitude L. When drawn with their tails at the same point, the angle between them is 30◦. The value of A· B is:

A. zero

B. L2

C. √3L2/2

D. 2L2

186) Let A = (2m)^i + (6m)^ j−(3m)^k and B = (4m)^i + (2m)^j + (1m)^k. Then A· B =

A. (8m)^i + (12m)^ j−(3m)^ k

B. (12m)^ i−(14m)^ j−(20m)^ k

C. 23m2

D. 17m2

187) Two vectors have magnitudes of 10m and 15m. The angle between them when they are drawn with their tails at the same point is 65◦. The component of the longer vector along the line of the shorter is:

A. 0

B. 4.2m

C. 6.3m

D. 9.1m

188) Let S = (1m) ˆ i + (2m)ˆj + (2m)ˆk and T = (3m) ˆ i + (4m)ˆk. The angle between these two vectors is given by:

A. cos−1(14/15)

B. cos−1(11/225)

C. cos−1(104/225)

D. cos−1(11/15)

189) Two vectors lie with their tails at the same point. When the angle between them is increased by 20◦ their scalar product has the same magnitude but changes from positive to negative. The original angle between them was:

A. 0

B. 60◦

C. 70◦

D. 80◦

190) If the magnitude of the sum of two vectors is less than the magnitude of either vector, then:

A. the scalar product of the vectors must be negative

B. the scalar product of the vectors must be positive

C. the vectors must be parallel and in opposite directions

D. the vectors must be parallel and in the same direction

191) If the magnitude of the sum of two vectors is greater than the magnitude of either vector, then: A. the scalar product of the vectors must be negative

B. the scalar product of the vectors must be positive

C. the vectors must be parallel and in opposite directions

D. the vectors must be parallel and in the same direction

E. none of the above

192) Vectors A and B each have magnitude L. When drawn with their tails at the same point, the angle between them is 60◦. The magnitude of the vector product A× B is:

A. L2/2

B. L2

C. √3L2/2

D. 2L2

193) Two vectors lie with their tails at the same point. When the angle between them is increased by 20◦ the magnitude of their vector product doubles. The original angle between them was about: A. 0

B. 18◦

C. 25◦

D. 45◦

194) Two vectors have magnitudes of 10m and 15m. The angle between them when they are drawn with their tails at the same point is 65◦. The component of the longer vector along the line perpendicular to the shorter vector, in the plane of the vectors, is:

A. 0

B. 4.2m

C. 6.3m

D. 9.1m

E. 14m

195) The two vectors (3m)ˆ i−(2m)ˆj and (2m)ˆi+(3m)ˆ j−(2m)ˆk de fine a plane. It is the plane of the triangle with both tails at one vertex and each head at one of the other vertices. Which of the following vectors is perpendicular to the plane?

A. (4m)ˆi + (6m)ˆj + (13m)ˆ k

B. (−4m)ˆi + (6m)ˆj + (13m)ˆ k

C. (4m)ˆ i−(6m)ˆj + (13m)ˆ k

D. (4m)ˆi + (6mˆ j−(13m)ˆ k

196) Let R = S× T and θ = 90 ◦, where θ is the angle between S and T when they are drawn with their tails at the same point. Which of the following is NOT true?

A. | R| = | S|| T|sinθ

B. − R = T × S

C. R· S =0

D. R· T =0

E. S· T =0

197) The value of ˆ i·(ˆ j× ˆk) is:

A. zero

B. +1

C. −1

D. 3

198) The value of ˆ k·(ˆ k× ˆi) is:

A. zero

B. +1

C. −1

D. 3

199) Velocity is defined as:

A. rate of change of position with time

B. position divided by time

C. rate of change of acceleration with time

D. a speeding up or slowing down

200) Acceleration is defined as:

A. rate of change of position with time

B. speed divided by time

C. rate of change of velocity with time
D. a speeding up or slowing down
201) Which of the following is a scalar quantity?
A. Speed
B. Velocity
C. Displacement
D. Acceleration
202) Which of the following is a vector quantity?
A. Mass
B. Density
C. Speed
D. Temperature
E. None of these
203) Which of the following is NOT an example of accelerated motion?
A. Vertical component of projectile motion
B. Circular motion at constant speed
C. A swinging pendulum
D. Earth's motion about sun
E. Horizontal component of projectile motion
204) A particle goes from x = −2m, y = 3m,z = 1m tox = 3m,y = −1m, z = 4m. Its displacement is:
A. (1m)ˆi + (2m)ˆj + (5m)ˆ k
B. (5m)ˆ i−(4m)ˆj + (3m)ˆ k
C. −(5m)ˆi + (4m)ˆ j−(3m)ˆ k
D. −(1m)ˆ i−(2m)ˆ j−(5m)ˆ k
205) A jet plane in straight horizontal flight passes over your head. When it is directly above you, the sound seems to come from a point behind the plane in a direction 30◦ from the vertical. The speed of the plane is:
A. the same as the speed of sound
B. half the speed of sound
C. three-fifths the speed of sound
D. 0.866 times the speed of sound
206) A plane traveling north at 200m/s turns and then travels south at 200m/s. The change in its velocity is:
A. zero
B. 200m/s north
C. 200m/s south
D. 400m/s north
E. 400m/s south
207) Two bodies are falling with negligible air resistance, side by side, above a horizontal plane. If one of the bodies is given an additional horizontal acceleration during its descent, it:
A. strikes the plane at the same time as the other body
B. strikes the plane earlier than the other body

C. has the vertical component of its velocity altered
D. has the vertical component of its acceleration altered
208) The velocity of a projectile equals its initial velocity added to:
A. a constant horizontal velocity
B. a constant vertical velocity
C. a constantly increasing horizontal velocity
D. a constantly increasing downward velocity
209) A stone thrown from the top of a tall building follows a path that is:
A. circular
B. made of two straight line segments
C. hyperbolic
D. parabolic
210) Identical guns fire identical bullets horizontally at the same speed from the same height above level planes, one on the Earth and one on the Moon. Which of the following three statements is/are true?
I. The horizontal distance traveled by the bullet is greater for the Moon.
II. The flight time is less for the bullet on the Earth.

III. The velocity of the bullets at impact are the same.

A. III only

B. I and II only

C. I and III only

D. II and III only

211) A bullet shot horizontally from a gun:
A. strikes the ground much later than one dropped vertically from the same point at the same instant
B. never strikes the ground
C. strikes the ground at approximately the same time as one dropped vertically from the same point at the same instant
D. travels in a straight line
212) A bomber flying in level flight with constant velocity releases a bomb before it is over the target. Neglecting air resistance, which one of the following is NOT true?
A. The bomber is over the target when the bomb strikes
B. The acceleration of the bomb is constant
C. The horizontal velocity of the plane equals the vertical velocity of the bomb when it hits the target
D. The bomb travels in a curved path

213) An airplane makes a gradual 90◦ turn while flying at a constant speed of 200m/s. The process takes 20.0 seconds to complete. For this turn the magnitude of the average acceleration of the plane is:
A. zero
B. 40m/s2
C. 20m/s2
D. 14m/s2
214) An airplane is flying north at 500 km/h. It makes a gradual 180◦ turn at constant speed, changing its direction of travel from north through east to south. The process takes 40s. The average acceleration of the plane for this turn (in km/h·s) is:
A. 12.5km/h·s, north
B. 12.5km/h·s, east
C. 12.5km/h·s, south
D. 25km/h·s, north
E. 25km/h·s, south
215) An object is moving on a circular path of radius π meters at a constant speed of 4.0m/s. The time required for one revolution is:
A. 2/π2 s
B. π2/2s
C. π/2s
D. π2/4
216) A particle moves at constant speed in a circular path. The instantaneous velocity and instantaneous acceleration vectors are:
A. both tangent to the circular path
B. both perpendicular to the circular path
C. perpendicular to each other
D. opposite to each other
217) A stone is tied to a string and whirled at constant speed in a horizontal circle. The speed is then doubled without changing the length of the string. Afterward the magnitude of the acceleration of the stone is:
A. the same
B. twice as great
C. four times as great
D. half as great
218) Two objects are traveling around different circular orbits with constant speed. They both have the same acceleration but object A is traveling twice as fast as object B. The orbit radius for object A is the orbit radius for object B.
A. one-fourth
B. one-half
C. the same as
D. twice
E. four times

219) A stone is tied to a 0.50-m string and whirled at a constant speed of 4.0m/s in a vertical circle. Its acceleration at the top of the circle is:

A. 9.8m/s2, up

B. 9.8m/s2, down

C. 8.0m/s2, down

D. 32m/s2, up

E. 32m/s2, down

220) A stone is tied to a 0.50-m string and whirled at a constant speed of 4.0m/s in a vertical circle. Its acceleration at the bottom of the circle is:

A. 9.8m/s2, up

B. 9.8m/s2, down

C. 8.0m/s2, up

D. 32m/s2, up

221) A car rounds a 20-m radius curve at 10m/s. The magnitude of its acceleration is:

A. 0

B. 0.20m/s2

C. 5.0m/s2

D. 40m/s2

222) For a biological sample in a 1.0-m radius centrifuge to have a centripetal acceleration of 25g its speed must be:

A. 11m/s

B. 16m/s

C. 50m/s

D. 122m/s

223) A girl jogs around a horizontal circle with a constant speed. She travels one fourth of a revolution, a distance of 25m along the circumference of the circle, in 5.0s. The magnitude of her acceleration is

A. 0.31m/s2

B. 1.3m/s2

C. 1.6m/s2

D. 3.9m/s2

E. 6.3m/s2 ans: C

224) A stone is tied to the end of a string and is swung with constant speed around a horizontal circle with a radius of 1.5m. If it makes two complete revolutions each second, the magnitude of its acceleration is:

A. 0.24m/s2

B. 2.4m/s2

C. 24m/s2

D. 240m/s2

225) A Ferris wheel with a radius of 8.0m makes 1 revolution every 10s. When a passenger is at the top, essentially a diameter above the ground, he releases a ball. How far from the point on the ground directly under the release point does the ball land?

A. 0
B. 1.0m
C. 8.0m
D. 9.1m
226) A boat is able to move through still water at 20m/s. It makes a round trip to a town 3.0 km upstream. If the river flows at 5m/s, the time required for this round trip is:
A. 120s
B. 150s
C. 200s
D. 300s
E. 320s
227) A boat is traveling upstream at 14km/h with respect to a river that is flowing at 6km/h (with respect to the ground). A man runs directly across the boat, from one side to the other, at 6km/h (with respect to the boat). The speed of the man with respect to the ground is:
A. 10km/h
B. 14km/h
C. 18.5km/h
D. 21km/h
228) A ferry boat is sailing at 12km/h 30 ◦ W of N with respect to a river that is flowing at 6.0km/h E. As observed from the shore, the ferry boat is sailing:
A. 30◦ E of N
B. due N
C. 30◦ W of N
D. 45◦ E of N
E. none of these
229) An airplane makes a gradual 90◦ turn while flying at a constant speed of 200m/s. The process takes 20.0 seconds to complete. For this turn the magnitude of the average acceleration of the plane is:
A. zero
B. 40m/s2
C. 20m/s2
D. 14m/s2
230) An airplane is flying north at 500 km/h. It makes a gradual 180◦ turn at constant speed, changing its direction of travel from north through east to south. The process takes 40s. The average acceleration of the plane for this turn (in km/h·s) is:
A. 12.5km/h·s, north
B. 12.5km/h·s, east
C. 12.5km/h·s, south
D. 25km/h·s, north
E. 25km/h·s, south
231) An object is moving on a circular path of radius π meters at a constant speed of 4.0m/s. The time required for one revolution is:

A. 2/π2 s
B. π2/2s
C. π/2s
D. π2/4
232) A particle moves at constant speed in a circular path. The instantaneous velocity and instantaneous acceleration vectors are:
A. both tangent to the circular path
B. both perpendicular to the circular path
C. perpendicular to each other
D. opposite to each other
233) A stone is tied to a string and whirled at constant speed in a horizontal circle. The speed is then doubled without changing the length of the string. Afterward the magnitude of the acceleration of the stone is:
A. the same
B. twice as great
C. four times as great
D. half as great
234) Two objects are traveling around different circular orbits with constant speed. They both have the same acceleration but object A is traveling twice as fast as object B. The orbit radius for object A is the orbit radius for object B.
A. one-fourth
B. one-half
C. the same as
D. twice
E. four times
235) A stone is tied to a 0.50-m string and whirled at a constant speed of 4.0m/s in a vertical circle. Its acceleration at the top of the circle is:
A. 9.8m/s2, up
B. 9.8m/s2, down
C. 8.0m/s2, down
D. 32m/s2, up
E. 32m/s2, down
236) A stone is tied to a 0.50-m string and whirled at a constant speed of 4.0m/s in a vertical circle. Its acceleration at the bottom of the circle is:
A. 9.8m/s2, up
B. 9.8m/s2, down
C. 8.0m/s2, up
D. 32m/s2, up
237) A car rounds a 20-m radius curve at 10m/s. The magnitude of its acceleration is:
A. 0
B. 0.20m/s2
C. 5.0m/s2

D. 40m/s2

238) For a biological sample in a 1.0-m radius centrifuge to have a centripetal acceleration of 25g its speed must be:

A. 11m/s

B. 16m/s

C. 50m/s

D. 122m/s

239) A girl jogs around a horizontal circle with a constant speed. She travels one fourth of a revolution, a distance of 25m along the circumference of the circle, in 5.0s. The magnitude of her acceleration is:

A. 0.31m/s2

B. 1.3m/s2

C. 1.6m/s2

D. 3.9m/s2

240) A stone is tied to the end of a string and is swung with constant speed around a horizontal circle with a radius of 1.5m. If it makes two complete revolutions each second, the magnitude of its acceleration is:

A. 0.24m/s2

B. 2.4m/s2

C. 24m/s2

D. 240m/s2

241) A Ferris wheel with a radius of 8.0m makes 1 revolution every 10s. When a passenger is at the top, essentially a diameter above the ground, he releases a ball. How far from the point on the ground directly under the release point does the ball land?

A. 0

B. 1.0m

C. 8.0m

D. 9.1m

242) A boat is able to move through still water at 20m/s. It makes a round trip to a town 3.0 km upstream. If the river flows at 5m/s, the time required for this round trip is:

A. 120s

B. 150s

C. 200s

D. 300s

E. 320s

243) A boat is traveling upstream at 14km/h with respect to a river that is flowing at 6km/h (with respect to the ground). A man runs directly across the boat, from one side to the other, at 6km/h (with respect to the boat). The speed of the man with respect to the ground is:

A. 10km/h

B. 14km/h

C. 18.5km/h

D. 21km/h

244) A ferry boat is sailing at 12km/h 30 ◦ W of N with respect to a river that is flowing at 6.0km/h E. As observed from the shore, the ferry boat is sailing:
A. 30◦ E of N
B. due N
C. 30◦ W of N
D. 45◦ E of N
E. none of these
245) An example of an inertial reference frame is:
A. any reference frame that is not accelerating
B. a frame attached to a particle on which there are no forces
C. any reference frame that is at rest
D. a reference frame attached to the center of the universe
246) An object moving at constant velocity in an inertial frame must:
A. have a net force on it
B. eventually stop due to gravity
C. not have any force of gravity on it
D. have zero net force on it
247) In SI units a force is numerically equal to the , when the force is applied to it.
A. velocity of the standard kilogram
B. speed of the standard kilogram
C. velocity of any object
D. acceleration of the standard kilogram
248) Which of the following quantities is NOT a vector?
A. Mass
B. Displacement
C. Weight
D. Acceleration
249) A newton is the force:
A. of gravity on a 1kg body
B. of gravity on a 1g body
C. that gives a 1g body an acceleration of 1cm/s2
D. that gives a 1kg body an acceleration of 1m/s2
250) The unit of force called the newton is:
A. 9.8kg·m/s2
B. 1kg·m/s2
C. defined by means of Newton's third law
D. 1kg of mass
251) A force of 1N is:
A. 1kg/s
B. 1kg·m/s
C. 1kg·m/s2
D. 1kg·m2/s

252) The standard 1-kg mass is attached to a compressed spring and the spring is released. If the mass initially has an acceleration of 5.6m/s2, the force of the spring has a magnitude of:
A. 2.8N
B. 5.6N
C. 11.2N
D. 0
253) Acceleration is always in the direction:
A. of the displacement
B. of the initial velocity
C. of the final velocity
D. of the net force
254) The term “mass” refers to the same physical concept as:
A. weight
B. inertia
C. force
D. acceleration
255) The inertia of a body tends to cause the body to:
A. speed up
B. slow down
C. resist any change in its motion
D. fall toward Earth
256) A heavy ball is suspended as shown. A quick jerk on the lower string will break that string but a slow pull on the lThe mass of a body:
A. is slightly different at different places on Earth
B. is a vector
C. is independent of the free-fall acceleration
D. is the same for all bodies of the same volume
257) The mass and weight of a body:
A. differ by a factor of 9.8
B. are identical
C. are the same physical quantities expressed in different units
D. are both a direct measure of the inertia of the body
E. have the same ratio as that of any other body placed at that location
258) An object placed on an equal-arm balance requires 12kg to balance it. When placed on a spring scale, the scale reads 12kg. Everything (balance, scale, set of weights and object) is now transported to the Moon where the free-fall acceleration is one-sixth that on Earth. The new readings of the balance and spring scale (respectively) are:
A. 12kg, 12kg
B. 2kg, 2kg
C. 12kg, 2kg
D. 2kg, 12kg

259) Two objects, one having three times the mass of the other, are dropped from the same height in a vacuum. At the end of their fall, their velocities are equal because:
A. anything falling in vacuum has constant velocity
B. all objects reach the same terminal velocity
C. the acceleration of the larger object is three times greater than that of the smaller object
D. the force of gravity is the same for both objects
E. none of the above
260) A feather and a lead ball are dropped from rest in vacuum on the Moon. The acceleration of the feather is:
A. more than that of the lead ball
B. the same as that of the lead ball
C. less than that of the lead ball
D. 9.8m/s2
261) Equal forces F act on isolated bodies A and B. The mass of B is three times that of A. The magnitude of the acceleration of A is:
A. three times that of B
B. 1/3 that of B
C. the same as B
D. nine times that of B
262) A car travels east at constant velocity. The net force on the car is:
A. east
B. west
C. up
D. down
E. zero
263) A constant force of 8.0 N is exerted for 4.0 s on a 16-kg object initially at rest. The change in speed of this object will be:
A. 0.5m/s
B. 2m/s
C. 4m/s
D. 8m/s
264) A 6-kg object is moving south. A net force of 12N north on it results in the object having an acceleration of:
A. 2m/s2, north
B. 2m/s2, south
C. 6m/s2, north
D. 18m/s2, north
265) A 9000-N automobile is pushed along a level road by four students who apply a total forward force of 500N. Neglecting friction, the acceleration of the automobile is:
A. 0.055m/s2
B. 0.54m/s2
C. 1.8m/s2

D. 9.8m/s2

266) An object rests on a horizontal frictionless surface. A horizontal force of magnitude F is applied. This force produces an acceleration:

A. only if F is larger than the weight of the object

B. only while the object suddenly changes from rest to motion

C. always

D. only if the inertia of the object decreases

267) A 25-kg crate is pushed across a frictionless horizontal floor with a force of 20N, directed 20◦ below the horizontal. The acceleration of the crate is:

A. 0.27m/s2

B. 0.75m/s2

C. 0.80m/s2

D. 170m/s2

268) A ball with a weight of 1.5N is thrown at an angle of 30◦ above the horizontal with an initial speed of 12m/s. At its highest point, the net force on the ball is:

A. 9.8N,30◦ below horizontal

B. zero

C. 9.8N,up

D. 9.8N,down

E. 1.5N,down

269) Two forces are applied to a 5.0-kg crate; one is 6.0N to the north and the other is 8.0N to the west. The magnitude of the acceleration of the crate is:

A. 0.50m/s2

B. 2.0m/s2

C. 2.8m/s2

D. 10m/s2

270) A 400-N steel ball is suspended by a light rope from the ceiling. The tension in the rope is:

A. 400N

B. 800N

C. zero

D. 200N

271) A heavy steel ball B is suspended by a cord from a block of wood W. The entire system is dropped through the air. Neglecting air resistance, the tension in the cord is:

A. zero

B. the difference in the masses of B and W

C. the difference in the weights of B and W

D. the weight of B

272) A car moves horizontally with a constant acceleration of 3m/s2. A ball is suspended by a string from the ceiling of the car. The ball does not swing, being at rest with respect to the car. What angle does the string make with the vertical?

A. 17◦

B. 35◦

C. 52◦

D. 73◦

273) A man weighing 700Nb is in an elevator that is accelerating upward at 4m/s2. The force exerted on him by the elevator floor is:

A. 71N

B. 290N

C. 410N

D. 700N

E. 990N

274) You stand on a spring scale on the floor of an elevator. Of the following, the scale shows the highest reading when the elevator:

A. moves upward with increasing speed

B. moves upward with decreasing speed

C. remains stationary

D. moves downward with increasing speed

275) You stand on a spring scale on the floor of an elevator. Of the following, the scale shows the highest reading when the elevator:

A. moves downward with increasing speed

B. moves downward with decreasing speed

C. remains stationary

D. moves upward with decreasing speed

276) When a 25-kg crate is pushed across a frictionless horizontal floor with a force of 200N, directed 20◦ below the horizontal, the magnitude of the normal force of the floor on the crate is:

A. 25N

B. 68N

C. 180N

D. 250N

E. 310N

277) A block slides down a frictionless plane that makes an angle of 30◦ with the horizontal. The acceleration of the block is:

A. 980cm/s2

B. 566cm/s2

C. 849cm/s2

D. zero

E. 490cm/s2

278) A 25-N crate slides down a frictionless incline that is 25◦ above the horizontal. The magnitude of the normal force of the incline on the crate is:

A. 11N

B. 23N

C. 25N

D. 100N

279) A 25-N crate is held at rest on a frictionless incline by a force that is parallel to the incline. If the incline is 25◦ above the horizontal the magnitude of the applied force is:

A. 4.1N

B. 4.6N

C. 8.9N

D. 11N

E. 23N

280) A 25-N crate is held at rest on a frictionless incline by a force that is parallel to the incline. If the incline is 25◦ above the horizontal the magnitude of the normal force of the incline on the crate is:

A. 4.1N

B. 4.6N

C. 8.9N

D. 11N

E. 23N

281) A 32-N force, parallel to the incline, is required to push a certain crate at constant velocity up a frictionless incline that is 30◦ above the horizontal. The mass of the crate is:

A. 3.3kg

B. 3.8kg

C. 5.7kg

D. 6.5kg

E. 160kg

282) A sled is on an icy (frictionless) slope that is 30◦ above the horizontal. When a 40-N force, parallel to the incline and directed up the incline, is applied to the sled, the acceleration of the sled is 2.0m/s2, down the incline. The mass of the sled is:

A. 3.8kg

B. 4.1kg

C. 5.8kg

D. 6.2kg

E. 10kg

283) When a 40-N force, parallel to the incline and directed up the incline, is applied to a crate on a frictionless incline that is 30◦ above the horizontal, the acceleration of the crate is 2.0m/s2, up the incline. The mass of the crate is:

A. 3.8kg

B. 4.1kg

C. 5.8kg

D. 6.2kg

E. 10kg

284) The “reaction” force does not cancel the “action” force because:
A. the action force is greater than the reaction force
B. they are on different bodies
C. they are in the same direction
D. the reaction force exists only after the action force is removed
E. the reaction force is greater than the action force
285) A book rests on a table, exerting a downward force on the table. The reaction to this force is:
A. the force of Earth on the book
B. the force of the table on the book
C. the force of Earth on the table
D. the force of the book on Earth
E. the inertia of the book
286) A lead block is suspended from your hand by a string. The reaction to the force of gravity on the block is the force exerted by:
A. the string on the block
B. the block on the string C. the string on the hand
D. the hand on the string
E. the block on Earth
287) A 5-kg concrete block is lowered with a downward acceleration of 2.8m/s2 by means of a rope. The force of the block on the rope is:
A. 14N, up
B. 14N, down
C. 35N, up
D. 35N, down
E. 49N, up
288) A 90-kg man stands in an elevator that is moving up at a constant speed of 5.0m/s. The force exerted by him on the floor is about:
A. zero
B. 90N
C. 880N
D. 450N
E. 49N
289) A 90-kg man stands in an elevator that has a downward acceleration of 1.4m/s2. The force exerted by him on the floor is about:
A. zero
B. 90N
C. 760N
D. 880N
E. 1010N
290) A 5-kg concrete block is lowered with a downward acceleration of 2.8m/s2 by means of a rope. The force of the block on Earth is:

A. 14N, up
B. 14N, down
C. 35N, up
D. 35N, down
E. 49N, up

291) A brick slides on a horizontal surface. Which of the following will increase the magnitude of the frictional force on it?
A. Putting a second brick on top
B. Decreasing the surface area of contact
C. Increasing the surface area of contact
D. Decreasing the mass of the brick
E. None of the above

292) The coefficient of kinetic friction:
A. is in the direction of the frictional force
B. is in the direction of the normal force
C. is the ratio of force to area
D. can have units of newtons
E. is none of the above

293) When the brakes of an automobile are applied, the road exerts the greatest retarding force:
A. while the wheels are sliding
B. just before the wheels start to slide
C. when the automobile is going fastest
D. when the acceleration is least
E. at the instant when the speed begins to change

295) A forward horizontal force of 12N is used to pull a 240-N crate at constant velocity across a horizontal floor. The coefficient of friction is:
A. 0.5
B. 0.05
C. 2
D. 0.2
E. 20

296) The speed of a 4.0-N hockey puck, sliding across a level ice surface, decreases at the rate of 0.61m/s2. The coefficient of kinetic friction between the puck and ice is:
A. 0.062
B. 0.41
C. 0.62
D. 1.2
E. 9.8

297) A 50-N force is applied to a crate on a horizontal rough floor, causing it to move horizontally. If the coefficient of kinetic friction is 0.50, in what direction should the force be applied to obtain the greatest acceleration?

A. Horizontal
B. 60◦ above the horizontal
C. 30◦ above the horizontal
D. 27◦ above the horizontal
E. 30◦ below the horizontal

298) A professor holds an eraser against a vertical chalkboard by pushing horizontally on it. He pushes with a force that is much greater than is required to hold the eraser. The force of friction exerted by the board on the eraser increases if he:
A. pushes with slightly greater force B. pushes with slightly less force
C. stops pushing
D. pushes so his force is slightly downward but has the same magnitude
E. pushes so his force is slightly upward but has the same magnitude

299) A horizontal force of 12N pushes a 0.5-kg book against a vertical wall. The book is initially at rest. If the coefficients of friction are μs =0 .6 and μk =0 .8 which of the following is true?
A. The magnitude of the frictional force is 4.9N
B. The magnitude of the frictional force is 7.2N
C. The normal force is 4.9N
D. The book will start moving and accelerate
E. If started moving downward, the book will decelerate

300) A horizontal force of 5.0N pushes a 0.50-kg book against a vertical wall. The book is initially at rest. If the coefficients of friction are μs =0 .6 and μk =0 .80, the magnitude of the frictional force is:

A. 0
B. 4.9N
C. 3.0N
D. 5.0N
E. 4.0N

301) A horizontal force of 12N pushes a 0.50-kg book against a vertical wall. The book is initially at rest. If μs =0 .6 and μk =0 .80, the acceleration of the book in m/s2 is:
A. 0
B. 9.4m/s2
C. 9.8m/s2
D. 14.4m/s2
E. 19.2m/s2

302) A horizontal force of 5.0N pushes a 0.50-kg block against a vertical wall. The block is initially at rest. If μs =0 .60 and μk =0 .80, the acceleration of the block in m/s2 is:
A. 0
B. 1.8
C. 6.0
D. 8.0

E. 9.8

303) A block is placed on a rough wooden plane. It is found that when the plane is tilted 30◦ to the horizontal, the block will slide down at constant speed. The coefficient of kinetic friction of the block with the plane is:

A. 0.500

B. 0.577

C. 1.73

D. 0.866

E. 4.90

304) A crate is sliding down an incline that is 35◦ above the horizontal. If the coefficient of kinetic friction is 0.40, the acceleration of the crate is:

A. 0

B. 2.4m/s2

C. 5.8m/s2

D. 8.8m/s2

E. 10.3m/s2

305) A 5.0-kg crate is resting on a horizontal plank. The coefficient of static friction is 0.50 and the coefficient of kinetic friction is 0.40. After one end of the plank is raised so the plank makes an angle of 25◦ with the horizontal, the force of friction is:

A. 0

B. 18N

C. 21N

D. 22N

E. 44N

306) A 5.0-kg crate is resting on a horizontal plank. The coefficient of static friction is 0.50 and the coefficient of kinetic friction is 0.40. After one end of the plank is raised so the plank makes an angle of 30◦ with the horizontal, the force of friction is:

A. 0

B. 18N

C. 21N

D. 22N

E. 44N

307) A 5.0-kg crate is on an incline that makes an angle of 30◦ with the horizontal. If the coefficient of static friction is 0.50, the minimum force that can be applied parallel to the plane to hold the crate at rest is:

A. 0

B. 3.3N

C. 30N

D. 46N

E. 55N

308) A 5.0-kg crate is on an incline that makes an angle of 30◦ with the horizontal. If the coefficient of static friction is 0.5, the maximum force that can be applied parallel to the plane without moving the crate is:

A. 0

B. 3.3N

C. 30N

D. 46N

E. 55N

309) Block A, with mass mA, is initially at rest on a horizontal floor. Block B, with mass mB, is initially at rest on the horizontal top surface of A. The coefficient of static friction between the two blocks is μs. Block A is pulled with a horizontal force. It begins to slide out from under B if the force is greater than:

A. mAg

B. mBg

C. μsmAg

D. μsmBg

E. μs(mA + mB)g

310) When body moves with constant acceleration the velocity time graph is:

Straight line

311) A/an --------is basic reason to change in the motion of an object according to newton's second law of motion

Net force

312) when a spring is compressed or stretched, the potential energy of the spring

Increases

313) when the velocity of an aeroplane is doubled,the momentum--------

(Increases uniformly)not sure(is conserved)

314) the momentum of an object at a given instant is independent of its

Acceleration

315) the velocity time graph is parallel to the axis the acceleration of moving body is

Zero

316) final takeoff velocity of airplane is 67m/s. The length of runway is 2Km the constant acceleration is

2.24ms^ 2

317) The law of inertia was firstly formulated by

Einstein

318) According to the equation of work, when a body sits in one place and studies for the whole night,he does

No work

319) Acceleration of an object is must be zero at a point where
The average velocity is zero
320) The acceleration of projectile in X-direction
0m/s^2
321) It is easier to walk on the concrete road than on ice because
The friction b/w the ice and feet is less than that b/w concrete and feet
322) An inelastic collision is one in which
Momentum is conserved but K.E is not conserved
323) Unit of distance is
Light year
324) The slope of velocity-time the graph at any point may be identified with
Average acceleration
325) The dot product of vector A with itself is equal to
A^2
326) An elastic is one in which
Momentum is conserved but K.E is not conserved
327) if the magnitude of force applied is increased the work done will
Be increased
328) A particle, held by a string whose other end is attached to a fixed point C, moves in a circle on a horizontal frictionless surface
Does not change
329) If the distance b/w all pairs of particles of the body do not change by applying a force then the body is said to be
Rigid
330) A bullet shoot straight up returns to its starting point in 10sec the initial speed was
49m/s
331) One revolution per minute is about
0.0524rad/s
332) The goal of all scientific inquiry(or scientific method)is
Predicting natural events based on known patterns
333) The center of mass of a uniform disk of radius R is located
At the center
334) Force
Equals the time rate of change of momentum
335) A mosquito's buzz is often decibel rating of 40db normal conservation rated at 60db.How many times more intense is normal conservation compared to a mosquito's buzz?
100
336) When number of bodies they can exert force one another and no external agency exert a force on them
An isolated system
337) back and forth in a leftward direction. This type of wave is known
Longitudinal

338) The center of mass of system consisting of Earth,the Sun,and the planet Mars is
Closer to the Sun than to either of the other bodies
339) A plane produces a sonic boom only when
It flys faster than the speed of sound
340) Young's modulus can be stated to calculate strain for a stress that is
Well below the yield strength
341) As the wavelength of a wave in a uniform medium increases ,it speed will be
Remain the same
342) A sound wave has a wavelength of 3.0m.the adjacent rarefaction center is
1.5m
343) Which statement completely submerged object resting on the ocean bottom is correct
The apparent weight of the object depends upon the object's density
344) When the mass of colliding body is much larger than the mass of body at rest.its velocity at collision
Becomes zero
345) The rate of change of momentum of a body is equal
Applied force
346) Unit for gravitational constant G are
m^3 /(kg.s2)
347) A sound wave has wavelength of 3.0m.the distance from a compression center of rarefaction
3.0
348) A net torque applied to a rigid object always tends to produce:
Rotational equilibrium
349) In simple harmonic motion, the restoring force must be proportional to the:
Displacement
350) The unit of Stress can be written as:
Nm
Nm2
Nm-2
N/m
351) A mass of 1kg lift vertically through a distance of 1m by a boy. What is the work done of boy? 10J
1J
0.1J
352) What is the basic unit of SI system?
Gram
Kilogram
Pressure
Watt
353) An example of SOP expression is
A + B(C + D)

A'B + AC' + AB'C
both (a) and (b)
354) 2's complement of 5 is
1011
355) How many data select lines are required for selecting eight inputs?
3
356) The boolean expression X = AB + CD represents
two ANDs ORed together
357) which of the following rules states that if one input of an AND gate is always 1, the output is equal to the other input?
A.1 = A
358) Which one of the following is NOT a valid rule of Boolean algebra?
A = A'
359) The complement of a variable is always
the inverse of the variable
360) The boolean expression (A +C)(AB' +AC)(A'C' + B')can be simplified to
AB + BC
361) The cell marked 6 in 4-variable K-Map represent minterm 6 or the maxterm 6 having the following binary value of variables A, B, C and D.
A=0, B=1, C=1, D=0
362) Adjacent 1s detector circuit will have active high output for the input
0011
363) A net torque applied to a rigid object always tends to produce:
rotational equilibrium
364) An object attached to one end of a spring makes 20 vibrations in 10 s. Its angular frequency is:
2.0 rad/s
365) In simple harmonic motion, the restoring force must be proportional to the:
displacement
366) Mercury is a convenient liquid to use in a barometer because:
it has a high density
367) The units of the electric field are:
J/m
368) A farad is the same as a
J/V
369) We desire to make an LC circuit that oscillates at 100 Hz using an inductance of 2.5H. We also need a capacitance of:
100 µF
370) The wavelength of red light is 700 nm. Its frequency is _____.
4.30 * 105 Hertz
371) Which of the following statements is NOT TRUE about electromagnetic waves?
The electromagnetic radiation from a burning candle is unpolarized

372) Radio waves and light waves are _____.
Electromagnetic and transverse both
373) Wien's Law states that, lmax = _____ K.
2.90 * 10-3 m

374) Interference of light is evidence that:

light is a wave phenomenon
375) Fahrenheit and Kelvin scales agree numerically at a reading of:
-40
376) According to the theory of relativity:
moving clocks run fast
377) Light from a stationary spaceship is observed, and then the spaceship moves directly away from the observer at high speed while still emitting the light. As a result, the light seen by the observer has:
lower frequency and a shorter wavelength than before
378) How fast should you move away from a 6.0 × 1014 Hz light source to observe waves with a frequency of 4.0 × 1014 Hz?
38c
379) The quantum number n is most closely associated with what property of the electron in a hydrogen atom?
Energy
380) The quantum number ms is most closely associated with what property of the electron in an atom?
Energy
381) As the wavelength of a wave in a uniform medium increases, its speed will _____.
Remain the same
382) The lowest tone produced by a certain organ comes from a 3.0-m pipe with both ends open. If the speed of sound is 340m/s, the frequency of this tone is approximately:
57 Hz
383) To raise the pitch of a certain piano string, the piano tuner:
loosens the string
384) An object attached to one end of a spring makes 20 vibrations in 10 s. Its angular frequency is:
12.6 rad/s
385) For an object in equilibrium the net torque acting on it vanishes only if each torque is calculated about:
the same point
386) Ten seconds after an electric fan is turned on, the fan rotates at 300 rev/min. Its average angular acceleration is:
3.14 rad/s2

387) A 4.0-N puck is traveling at 3.0m/s. It strikes a 8.0-N puck, which is stationary. The two pucks stick together. Their common final speed is:
1.0m/s
389) An object moving in a circle at constant speed:
has an acceleration of constant magnitude
390) A plane traveling north at 200m/s turns and then travels south at 200m/s. The change in its velocity is:
400m/s south
391) At time t = 0 a car has a velocity of 16 m/s. It slows down with an acceleration given by −0.50t, in m/s2 for t in seconds. It stops at t =
8.0 s
392) 1 mi is equivalent to 1609 m so 55 mph is:
25 m/s
393) The number of significant figures in 0.00150 is:
3
394) One revolution is the same as: 2π rad
2π rad
395) For a body to be in equilibrium under the combined action of several forces:
any two of these forces must be balanced by a third force
396) A bucket of water is pushed from left to right with increasing speed across a horizontal surface. Consider the pressure at two points at the same level in the water.
It is higher at the point on the left
397) An organ pipe with both ends open is 0.85m long. Assuming that the speed of sound is 340m/s, the frequency of the third harmonic of this pipe is:
600 Hz
398) Capacitors C1 and C2 are connected in series. The equivalent capacitance is given by
C1C2/(C1 + C2)
399) If the potential difference across a resistor is doubled:
only the current is doubled
400) By using only two resistors, R1 and R2, a student is able to obtain resistances of 3Ω, 4Ω, 12Ω, and 16 Ω. The values of R1 and R2 (in ohms) are:
4, 12
401) Faraday's law states that an induced emf is proportional to:
the rate of change of the magnetic flux
402) A generator supplies 100V to the primary coil of a transformer. The primary has 50 turns and the secondary has 500 turns. The secondary voltage is:
1000V
403) Which of the following electromagnetic radiations has photons with the greatest energy?
x rays
404) A virtual image is one:
from which light rays diverge as they pass through

405) What is the unit of magnification factor?

no units

406) During an adiabatic process an object does 100 J of work and its temperature decreases by 5K. During another process it does 25 J of work and its temperature decreases by 5 K. Its heat capacity for the second process is.

15 J/K

407) An ideal gas expands into a vacuum in a rigid vessel. As a result there is:

a change in entropy

408) The Stern-Gerlach experiment makes use of:

a strong non-uniform magnetic field

409) A large collection of nuclei are undergoing alpha decay. The rate of decay at any instant is proportional to:

the number of undecayed nuclei present at that instant

410) As a 2.0-kg block travels around a 0.50-m radius circle it has an angular speed of 12 rad/s. The circle is parallel to the xy plane and is centered on the z axis, a distance of 0.75m from the origin. The z component of the angular momentum around the origin is:

6.0kg · m2/s