PHY101 quiz 2 file

Compose by Ali Hassan

A sound wave has a wavelength of 3.0m. The distance from a compression center to the adjacent rarefaction center is:

a) 0.75m

b) 1.5m

c) 3.0m

d) need to know wave speed

The speed of sound in medium depends upon

a) amplitude

b) frequency

c) wavelength

d) properties of the medium

Which of the following will remain unchanged when a sound wave travels in air or in water?

a) Amplitude

b) Wavelength

c) Frequency

d) Speed

The vibrations or the pressure variations inside the inner air are converted into electrical signals by the ____.

a) cochlea

b) tympanic membrane

c) pinna

d) anvil

Sound and light waves both

a) have similar wavelength

b) obey the laws of reflection

c) travel as longitudinal waves

d) travel through vacuum

A mosquito's buzz is often rated with a decibel rating of 40 dB. Normal conversation is often rated at 60 dB. How many times more intense is normal conversation compared to a mosquito's buzz?

a) 2

b) 20

c) 100

d) 400

Point where force causes system to move without rotation is

a) 2 times beyond centre of mass

b) edge of the body

c) mid point of body

d) center of mass

The frequency which is not audible to the human ear is

a) 50 Hz

b) 500 Hz

c) 5000 Hz

d) 50000 Hz

If the speed of sound is 340 m/s a plane flying at 400m/s creates a conical shock wave with an apex half angle of:

a) 0 (no shock wave)

b) 32?

c) 40?

d) 58?

A municipal water supply is provided by a tall water tower. Water from this tower flows to a building. How does the water flow out of a faucet on the ground floor of a building compare with the water flow out of an identical faucet on the second floor of the building?

a) Water flows more rapidly out of the ground-floor faucet.

b) Water flows more rapidly out of the second-floor faucet.

c) Water flows at the same speed out of both faucets.

d) The speed of water flow cannot be determined unless the height of the water tower is known.

A sound wave has a wavelength of 3.0m. The distance from a compression center to the adjacent to the rarefaction center is:

a) 0.75m

b) 1.5m

c) 3.0m

d) need to know frequency (not confirm)

A plane produces a sonic boom only when:

a) it emits sound waves of very long wavelength

b) it emits sound waves of high frequencyit flys at high altitudes

c) it flys faster than the speed of sound

d) it flys faster than the speed of sound

acceleration of an object must be zero at a point where:

a) the instantaneous velocity is zero but changing

b) the instantaneous velocity is constant

c) the average velocity is zero

d) the instantaneous velocity is not zero but changing

Coulomb's law is only true for point charges whose sizes are

a) large

b) very small

c) very large

d) medium

A vector A is added to a vector B. The resultant vector A + B have greatest magnitude when:

a) The magnitude of vector A + B does not depend on the directions of A and B

b) When vectors A and B are parallel and in the opposite direction

c) When vectors A and B are parallel and in the same direction

d) When vectors A and B are perpendicular

Earth exerts a gravitational force on the Moon, keeping it in its orbit. The reaction to this force, in the sense of Newton's third law, is:

a) the centripetal force on the Moon

b) the nearly circular orbit on the Moon

c) the gravitational force on Earth by the Moon

d) the tides due to the Moon

The angular momentum vector of Earth about its rotation axis, due to its daily rotation, is directed:

a) south

b) north

c) tangent to the equator toward the west

d) tangent to the equator toward the east

Work may be done by ____.

a) only vehicles

b) only non-living objects

c) only living organisms

d) both living organisms and non-living objects

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

a) amplitude

b) frequency

c) velocity

d) displacement

The turning effect of a force is called the force's

a) momentum

b) torque/moment

c) distance

d) inertia

How much pressure is exerted on a submarine at a depth of 8.50 km in the Pacific Ocean? (The density of sea water = 1.025 * 103 kg/m3, and the atmospheric pressure at sea level = 1.01 * 105 Pa.)

a) 8.6 * 105 Pa

b) 8.7 * 106 Pa

c) 9.5 * 106 Pa

d) 8.6 * 106 Pa

A 4.0-m long steel beam with a cross-sectional area of 1.0 × 10-2 m2 and a Young's modulus of 2.0 × 1011 N/m2 is wedged horizontally between two vertical walls. In order

to wedge the beam, it is compressed by 0.020mm. If the coefficient of static friction between the beam and the walls is 0.70 the maximum mass (including its own) it can bear without slipping is:

a) 3.6 kg

b) 36 kg

c) 71 kg

d) 710 kg

The torque about any two points has the same value when the body is in

a) translational equilibrium

b) neutral equilibrium

c) dynamic equilibrium

d) static equilibrium

The work done by gravity during the descent of a projectile:

a) depends for its sign on the direction of the y axis

b) is positive

c) is negative

d) is zero

Take the speed of sound to be 340m/s. A thunder clap is heard about 3 s after the lightning is seen. The source of both light and sound is:

a) moving overhead faster than the speed of sound

b) emitting a much higher frequency than is heard

c) emitting a much lower frequency than is heard

d) about 1000m away

The magnitude of the acceleration of a planet in orbit around the Sun is proportional to:

a) the mass of the planet

b) the mass of the Sun

c) the distance between the planet and the Sun

d) the reciprocal of the distance between the planet and the Sun

The unit kg-m2/s can be used for:

a) angular momentum

b) rational kinetic energy

c) rational inertia

d) torque

Which of the following statements about floating object is correct?

a) The object's density is greater than the density of the fluid on which it floats.

b) The object's density is equal to the density of the fluid on which it floats.

c) The displaced volume of fluid is greater than the volume of the object.

d) The buoyant force equals the object's weight.

When a spring is compressed or stretched, the potential energy of the spring

a) Decreases

b) stays constant

c) Increases

d) Becomes zero

An ultrasonic wave is sent from a ship towards the bottom of the sea. It is found that the time interval between the sending and receiving of the wave is 1.6 s. What is the depth of the sea, if the velocity of sound in the seawater is 1400 m/s?

a) 1120 m

b) 560 m

c) 1400 m

d) 112 m

To determine if a rigid body is in equilibrium the vector sum of the gravitational forces acting on the particles of the body can be replaced by a single force acting at:

a) a point on the boundary

b) the center of gravity

c) the geometrical center

d) the center of mass

e) A couple produces:

A couple produces:

a) Purely linear motion

b) Purely rotational motion

c) Linear and rotational motion

d) No motion

In ____ object returns to its original position if displaced slightly

a) dynamic equilibrium

b) stable equilibrium

c) unstable equilibrium

d) rotational equilibrium

The momentum of an object at a given instant is independent of its:

a) acceleration

b) velocity

c) speed

d) mass

A vector is obtained by dividing the vector by its magnitude:

a) unit

b) position

c) normal

d) negative

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

a) lot of work

b) no work

c) too much work

d) very little work

The application/s of dimensional analysis is/are:

i. To convert a physical quantity from one system of units to an other.

ii. To check the dimensional correctness of a given equation.

iii. Establish a relationship between different physical quantities in an equation.

a) i only

b) ii & iii only

c) i & iii only

d) I, ii & iii

The angle between rectangular components of a vector is:

a) 0*

b) 45*

c) 60*

d) 90*

A qualitative definition of force is given by which law?

a) Newton's second law of motion

b) Newton's law of gravitation

c) Newton's third law of motion

d) law of inertia

Which pair will always have the same magnitude to the rate of change of position?

a) Average velocity and instantaneous velocity

b) Average speed and instantaneous speed

c) Instantaneous speed and instantaneous velocity

d) Average speed and average velocity

Add two vectors of length 4 m & 5 m but their orientation is not known, The length after addition of these two vectors will be:

a) Less than 1 m

b) between 9 m and 1 m

c) between 9 m and 5 m

d) 9m

What is the angle of projection of projectile, for which its maximum height and horizontal range are equal?

a) 30*

b) 36*

c) 76*

d) 90*

A ____ vector is obtained by dividing the vector by its magnitude:

a) unit

b) position

c) normal

d) negative

When the momentum of a body is doubled, its kinetic energy ____ .

a) Becomes ten times its kinetic energy

b) Becomes four times its initial energy

c) Drop to zero

d) Remains the same

A ball is thrown upward into air with a speed that is greater than terminal speed. It lands at the place where it was thrown. During its flight the force of air resistance is the greatest:

a) just after it is thrown

b) half way up

c) at the top of its trajectory

d) halfway down

An object moves in a circle at constant speed. The work done by the centripetal force is zero because:

a) the displacement for each revolution is zero

b) the average force for each revolution is zero

c) there is no firiction

d) the centripetal force is perpendicular to the velocity

It is easier to walk on concrete road than on ice because:

a) the amount of firection is same for both (ice & concrete road)

b) there is more friction on the ice than on concrete

c) ice is soft and spongy where as concrete is hard

d) the friction between the ice and the feet is less than that between the concrete and feet

An inellastic collidion is one in which:

a) momentum is not conserved but kinetic energy is conserved

b) total mass is not conserved but momentum is conserved

c) neither kinetic energy nor momentum is conserved

d) momentum is conserved but kinetic energy is not conserved

When you step on the accelerator to increase the speed of your car, the force that accelerates the car is

a) the normal force of the road on the tires

b) the force of the engine on the drive shaft

c) the force of friction of the road on the tires

d) the force of your foot on the accelerator

Light year is a unit of:

a) accelration

b) velocity

c) time

d) distance

A body is changing its direction but speed is constant, the object is:

a) accelerating

b) slowing down

c) speeding

d) Displacing

The ratio of circumference of a circle to its diameter is equal to:

a) 2 π

b) π

c) π /2

d) one steradian

Which of the following statements are TRUE of sound waves? Identify all that apply.

a) Sound can travel through a vacuum
b) A sound wave is a transverse wave
c) A sound wave is a mechanical wave
d) To hear the sound of a tuning fork, the tines of the fork must move air from the fork to one's ear

A force of 120 N is exerted on a 40 kg container which sits on afloor. If the frictional force between floor and container is 80 N. What is the magnitude of the acceleration of the container?

a) 2 ms^-2
b) 5 ms^-2
c) 3 ms^-2
d) 1 ms^-2

If a simple pendulum oscillates with an amplitude 50 mm and time period 2s, then its maximum velocity is

a) 0.15 m/s
b) 0.8 m/s
c) 0.16 m/s
d) 0.1m/s

Acceleration in a body is always produced in the direction of:

a) Velocity
b) Weight
c) Force

d) Acceleration

The center of mass of a uniform disk of radius R is located:

a) at the center

b) a distance R/3 from the center

c) a distance R/2 from the center

d) on the rim

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

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

b) the sum of components of all the forces in any direction must equal zero

c) all of the forces form pairs of equal and opposite forces

d) all the forces must be applied at the same point

A source of frequency of 500 Hz emits waves of wavelength 0.4 m, how long does the wave take to travel 600 m?

a) 3 s

b) 6 s

c) 9 s

d) 12 s

Momentum may be expressed in:

a) kg/(m s)

b) N s

c) gram s

d) kg/m

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 x 108 N/m2. The elongation of the rod is:

a) 0.0020mm

b) 0.0040mm

c) 0.14mm

d) 0.55mm

The speed of a sound wave is determined by:

a) its amplitude

b) its intensity

c) the transmitting medium

d) number of harmonics present

Which of the following statement is TRUE of sound intensity and decibel levels? Identify all that apply.

a) The intensity of sound which corresponds to the threshold of pain is one trillion times more intense than the sound which corresonds to the threshold of hearing.

b) Two sounds which have a ratio of decible ratings equal to 2.0. This means that the second sound is twice as intense as the first sound.

c) Sound A is 20 times more intense than the sound B. So if sound B is rated at 30 dB, then sound A is rated at 50 dB.

d) A machine produces a sound which is rated at 60 dB. If two of the machines were used at the same time, the decibel rating would be 120 dB.

Sound waves are

a) longitudinal

b) transverse

c) partly longitudinal and partly transverse

d) sometimes longitudinal and sometimes transverse

For an ideal fluid flowing through a horizontal pipe, Bernoulli's equation states that the sum of the pressure and energy per unit volume along the pipe does which of the following? (Assume measurements are taken along the pipe in the direction of fluid flow.)

a) increases as the pipe diameter increases

b) decreases as the pipe diameter increases

c) remains constant as the pipe diameter increases

d) increases, then decreases as the pipe diameter increases

A 2.0-kg block travels around a 0.5-m radius circle with an angular velocity of 12 rad/s. Its angular momentum about the center of the circle is:

a) 6.0 kg.m2/s

b) 12 kg.m2/s

c) 48 kg/m2.s

d) 72 kg.m2/s2

The fundamental dimensions of angular momentum are

a) ML-2T-2

b) MLT-1

c) $ML2T^{-1}$

d) ML2T-2