1. In humans, heart functions as a source of  
   (A) battery  
   (B) charge  
   (C) electric generator  
   (D) electromotive force
2. **An artificial Satellite revolves round the Earth in circular orbit, which quantity remains constant?**

[**A.**](javascript:%20void%200;) Angular Momentum

[**B.**](javascript:%20void%200;) Linear Velocity

[**C.**](javascript:%20void%200;) Angular Displacement

[**D.**](javascript:%20void%200;)None of these

1. **Energy possessed by a body in motion is called**

[**A.**](javascript:%20void%200;)Kinetic Energy

[**B.**](javascript:%20void%200;)Potential Energy

[**C.**](javascript:%20void%200;)Both A and B

[**D.**](javascript:%20void%200;)None of these

1. **If electrical conductivity increases with the increase of temperature of a substance, then it is a:**

[**A.**](javascript:%20void%200;)Conductor

[**B.**](javascript:%20void%200;)Semiconductor

[**C.**](javascript:%20void%200;)Insulator

[**D.**](javascript:%20void%200;)Carborator

1. **Minimum distance between and object and real image of a convex lens is:**

[**A.**](javascript:%20void%200;)4<i>f</i>

[**B.**](javascript:%20void%200;)3<i>f</i>

[**C.**](javascript:%20void%200;)2<i>f</i>

[**D.**](javascript:%20void%200;)<i>f</i>

1. **If a lift is going up with acceleration, the apparent weight of a body is**

[**A.**](javascript:%20void%200;)More or less the true weight

[**B.**](javascript:%20void%200;) Equal to the true weight

[**C.**](javascript:%20void%200;)Less than the true weight

[**D.**](javascript:%20void%200;)More than the true weight

1. All electromagnetic radiations travel through vacuum with the speed  
   (A) equal the speed of light  
   (B) less than the speed of light  
   (C) greater than the speed of light  
   (D) (A) or (B)
2. Human eye can view electromagnetic radiation with wavelengths from \_\_\_\_\_ to \_\_\_\_\_ nano-meter.  
   (A) 200, 500  
   (B) 200, 600  
   (C) 400, 700  
   (D) 400, 800
3. Which waves are commonly produced by oscillating electric circuits?  
   (A) Microwaves  
   (B) Radio waves  
   (C) Infrared rays  
   (D) X-Rays
4. The tuning of a radio or TV receiver is usually done by varying the \_\_\_\_\_ of the circuit.  
   (A) inductance  
   (B) capacitance  
   (C) resistance  
   (D) voltage
5. If a force acting on an object of mass 12 kg produces an acceleration of 5 m/s2. Then the same force applied to an object of mass 10 kg will produce an acceleration of \_\_\_\_\_ m/s2.  
   (A) 5  
   (B) 6  
   (C) 7  
   (D) 8
6. A 20-year-old person goes at a high speed in a rocket on his birthday. when he comes back to earth after 1 earth year, he would be \_\_\_\_\_\_\_\_\_\_\_  
   a) 1 year older  
   b) 2 years older  
   c) A few months older  
   d) Sam1e age
7. Assertion: A hydrogen filled balloon stops using after it has attained a certain height in the sky.  
   Reason: The atmospheric pressure decreases with height and becomes zero when maximum height is attained.  
   a) Both assertion and reason are true and the reason is the correct explanation of the assertion  
   b) Both assertion and reason are true but the reason is not the correct explanation of the assertion  
   c) Assertion is true but the reason is false  
   d) Assertion and reason is false
8. A wooden block is taken to the bottom of a deep, calm lake of water and then released. It rises up with a \_\_\_\_\_\_\_\_\_\_\_  
   a) Constant acceleration  
   b) Decreasing acceleration  
   c) Constant velocity  
   d) Decreasing velocity
9. The value of escape velocity on a certain planet is 2km/s. Then the value of orbital speed for a satellite orbiting close to its surface is \_\_\_\_\_\_\_\_\_\_\_  
   a) 12km/s  
   b) 1km/s  
   c) √2km/s  
   d) 2√2km/s
10. The radius of curvature of a mirror is 20cm the focal length is

         a. 20cm

         b. 10cm

         c. 40cm

         d. 5cm

1. A concave mirror gives real, inverted and same size image if the object is placed

         a. At F

         b. At infinity

         c. At C

         d. Beyond C

1. The Biot-savart's law is a general modification of

   A. Kirchhoff's law

   B. Lenz's law

   C. Ampere's law

   D. Faraday's laws

1. The magnetic materials exhibit the property of magnetisation due to

   A. Spin of nucleus

   B. Spin of electrons

   C. Orbital motion of electrons

   D. All of the above

*20. Red light is used to form a two-slit interference pattern on a screen. As the two slits are moved further apart, the separation of the bright bands on the screen*

a. decreases.  
b. increases.  
c. remains the same.

*21. If all the labels have come off the sunglasses in the drug store, you could tell which ones were polarized by*

a. feeling their surfaces.  
b. scratching the lenses to see if they are plastic.

c. looking through two lenses and rotating one.  
d. looking at the light from florescent lights.

 22. A window which can transmit all the incident light without any reflection is called \_\_\_\_\_\_\_\_\_\_\_  
a) Polarized Window  
b) Malus Window  
c) Brewster Window  
d) Non-reflecting window

|  |  |  |
| --- | --- | --- |
| 23. The practical illustration of the phenomenon of mutual induction is   1. A.C generator 2. D.C dynamo 3. Induction coil 4. Transformer   **24. Find the force acting on a conductor 3m long carrying a current of 50 amperes at right angles to a magnetic field having a flux density of 0.67 tesla**  (A) 100 N  (B) 400 N  (C) 600 N  (D) 1000 N  25. As per Faraday's laws of electromagnetic induction, an e.m.f. is induced in a conductor whenever it  a. Lies perpendicular to the magnetic flux  b. Lies in a magnetic field  c. Cuts magnetic flux  d. Moves parallel to the direction of the magnetic field  **26. An e.m.f. of 16 volts is induced in a coil of inductance 4H. The rate of change of current must be**  (A) 64 A/s  (B) 32 A/s  (C) 16 A/s  (D) 4 A/s   |  | | --- | | 27. Self inductance of a coil depends upon | |  |  1. Current flowing 2. Number of turns per unit length 3. Voltage produce 4. All   28. Energy stored in a magnetic field is given by:  a. LI2  b. L2I/2  c. LI2/2  d. IL2 |
|  |

1. Why do objects float in liquids denser than themselves?

If an object were completely immersed in a liquid denser than it, the resulting buoyant force would exceed the weight of the object. This is because the weight of the liquid displaced by the object is greater than the weight of the object (since the liquid is denser). As a result, the object cannot remain completely submerged and it floats. The scientific name for this phenomenon is *Archimedes Principle*.

1. When a moving car encounters a patch of ice the brakes are applied. Why is it desirable to keep the wheels rolling on the ice without locking up?

Static friction is greater than kinetic friction.  
  
Static friction exists if the wheels keep rolling on the ice without locking up, resulting in maximum braking force. However, if the wheels lock up then kinetic friction takes over since there is relative slipping between wheel and ice. This reduces the braking force and the car takes longer to stop.  
  
Anti-lock braking systems (ABS) on a vehicle prevent the wheels from locking up when the brakes are applied, thus minimizing the amount of time it takes for the vehicle to reach a complete stop. Also, by preventing the wheels from locking up you have greater control of the vehicle.

1. Suppose we have two particles, one is neutral and other is charged (either +ve+ve or −ve−ve) how can we know which particle has neutral charge and which has +ve+ve or −ve−ve charge, without using third medium?

The charged particles are affected by electromagnetic fields. Therefore, a simple form of determining which particle is charged and which one is neutral is to introduce them into a region with a non-zero electromagnetic field. Two situations are possible:

∙∙ **Electric field region**, if the charges are placed at rest in the electric field region the charged particle feels the effect of the electric force and accelerates. Meanwhile, the neutral particle is unaffected by the field and remains at rest.

∙∙ **Magnetic field region**, the magnetic force does not act on charges at rest. Therefore, the particles must be introduced in the region with non-zero velocity. Under the action of the magnetic force, the charged particle will deflect and undergo circular motion. The neutral particle, on the other hand, maintains its direction unaltered since the magnetic force does not influence it.

If the field has electric and magnetic components the result will be a mixture of the described behaviors. Nevertheless, the neutral particle is not affected by the electromagnetic field.

1. **Why were electrons chosen to be negatively charged? Wouldn't it make more sense to call electrons positively charged because when they move they make electricity?**

First of all, "electricity" does not mean "moving electric charge". If "electricity" meant "moving electric charge" then "static electricity" would mean "stationary moving electric charge," which is nonsense. "Electricity" is a general term describing all effects connected to electric charges. When people use the word "electricity" to describe what is going on in an electric wire, they usually mean "electric current".

Secondly, electric current is not just a bunch of moving electric charges. Electric current is the net movement of electric charges and the movement of electric field disturbances connected to the charges. That is why electrical signals in a wire, such as telephone calls, travel on the order of the speed of light while the electrons themselves travel much slower. If electric currents were nothing more than moving electrons, then it would take 6 months for your voice on the telephone call to reach the other side of town. The objects in a material that are contributing the most to an electric current are called the charge carriers.

# Why is a 12-volt household battery harmless, but the shock from a 12-volt car battery will kill you?

The shock from a car battery will not kill you. In fact, under normal conditions, a 12-volt car battery will usually not even shock you. Car batteries are not harmless, though. There are many ways you can be injured by car batteries:

* Car battery acid can leak out of the battery and burn your skin.
* If a flame or spark is brought too close to a car battery with improper ventilation, hydrogen gas from the battery can explode, splashing battery fragments and acid all over your skin.
* Sparks (arcing) between a car battery terminal and other metal parts can cause the metal to get hot enough to burn you.
* If a car battery is short-circuited by a cable, the cable can heat up enough to catch fire.

1. **When A Radar Gun Says The Pitch Is 90 Miles Per Hour At What Point In The Balls Travel To Home Plate Is The Radar Gun Measuring The Velocity?**

**Answer :**

The measurement is made at the point where the ball is when the trigger is squeezed and the contacts close to activate the unit. The gun responds in a "split second" by sending out a pulse, catching the return, and then comparing the two to discover the difference (the Doppler shift). It is so fast that the ball doesn't travel very far in the time it takes the unit to respond and resolve the speed.

1. **How Does The Arrangement Of Atoms In Most Solids Differ From The Arrangement Of Atoms In A Liquid?**

**Answer :**

The arrangement of atoms in solids are different from those in liquids in that they are unable to move from their location in the solid, where they can move in the liquid. A solid's atoms are vibrating very rapidly, but the molecules are all locked into place, whereas in a liquid the molecules are free to move around. Also in general the atoms of a solid are closer together than those of a liquid with the exception of water, whose solid form is less dense.

1. **Why Does The Pilot Tilt The Outer Wing Of The Airplane Inward While Taking A Turn?**

**Answer :**

Airplanes have two control surfaces involved when turning, the ailerons are on the trailing edge of the wings. By moving them in opposite directions, one up one down, the plane tilts, the lift the wings are generating now causes the plane to turn instead of going up. The rudder which is vertical at the back turns the plane to the left and right, but the rudder alone can turn the plane but not change its direction (side slipping) so in order to turn correctly you must use both the rudder and the ailerons.

1. What is the working principle of washing machine?

Centrifugation is a separation process which uses the action of centrifugal force to promote accelerated settling of particles in a solid-liquid mixture.

The washing machine consists of centrifuge for this purpose. A centrifuge is a piece of equipment that puts an object in rotation around a fixed axis, applying a force perpendicular to the axis of spin that can be very strong.