WAVE

A wave is a disturbance, which propagates energy from one place to the other without the transportation of matter.
Waves are broadly of two types:
• Mechanical wave (longitudinal wave and transverse wave)
• Electromagnetic wave
• Following are the electromagnetic (Non-mechanical)waves
a. Gama rayas (Highest frequency)
b. X-rays
c. UV rays
d. Visible radiation
e. infra-red rays
f. short radio waves
g. Long radio waves (Lowest frequency)
All are in decreasing order of the frequency.Following waves are not electromagnetic.
a. Cathode rays
b. Canal rays
c. alpha rays d. beta rays e. sound wave f. ultrasonic wave

Longitudinal Waves
• In this wave the particles of the medium vibrate in the direction of propagation of wave. • Waves on springs or sound waves in air are examples of longitudinal waves.

Transverse Waves
• In this wave, the particles of the medium vibrate perpendicular to the direction of propagation of wave
.• Waves on strings under tension, waves on the surface of water are the examples of transverse waves

. **Electromagnetic Waves**
• The waves, which do not require medium for their propagation i.e., which can propagate even through the vacuum are called electromagnetic waves.
• Light radio waves, X-rays etc are the examples of electromagnetic wave. These waves propagate with the velocity of light in vacuum

. **Sound Waves**
Sound waves are longitudinal mechanical waves. Eased on their frequency range sound waves are divided into following categories.
• The sound waves which lie in the frequency range 20 Hz to 20000 Hz are called audible waves.
• The sound waves having frequencies less than 20 Hz are called infrasonic
• The sound waves having frequencies greater than 20000 Hz are called ultrasonic waves.

• Ultrasonic waves are used for sending signals, measuring the depth of see, cleaning clothes and machinery parts, remaining lamp short from chimney of factories and in ultrasonography.

Speed of Sound

• Speed of sound is maximum in solids minimum in gases.
• When sound goes from one medium to another medium, its speed and wave length changes, but frequency remain unchanged. The speed of sound remains unchanged by the increase or decrease of pressure
• The speed of sound increases with the increase of temperature of the medium. • The speed of sound is more in humid air than in dry air because the density of humid air is less than the density.

Echo:
The repetition of sound due to reflection of sound waves is called an echo.

Intensity: It is defined as amount of energy passing normally per unit area held around that point per source unit time.

Pitch: The sensation of a frequency is commonly referred to as the pitch of a sound.

Sonar: It stands for sound navigation and ranging. It is used to measure the depth of a sea, to locate the enemy submarines and shipwrecks.

Doppler's Effect
If there is a relative motion between source of sound and observer, the apparent frequency of sound heard by the observer is different from the actual frequency of sound emitted by the so

LIGHT

• Light is a form of energy, which is propagated as electromagnetic wave.
• It is the radiation which make our eyes able to 'see the object. Its speed is 3 x 108 m/s. It is the form of energy. It is a transverse wave.
• It takes 8 min 19s to reach on the earth from the sun and the light reflected from moon takes 1.28s to reach earth.
• Primary Colours- Blue, Red, Green
• Secondary Colours- The coloured produced my mixing any two primary colors
• Complementary Colours- Any two colours when added produce white light.
• Blue colour of sky is due to scattering of light.
• The brilliant red colour of rising and setting sun is due to scattering of light. Human Eye
• Least distance of distinct vision is 25 cm.
• Myopia or short sightedness- far objects cannot see clear
• Hyperopia or hypermetropia or Long-sightedness Near objects cannot see clear
• Presbyopia- in elder person, both far and near cannot see clear

Reflection of Light

• When a ray of light falls on a boundary separating two media comes back into the same media, then this phenomenon is called reflection of light.

Reflection from Plane Mirror

• If an object moves towards a plane mirror with speed v, relative to the object the moves towards it with a speed 2v.