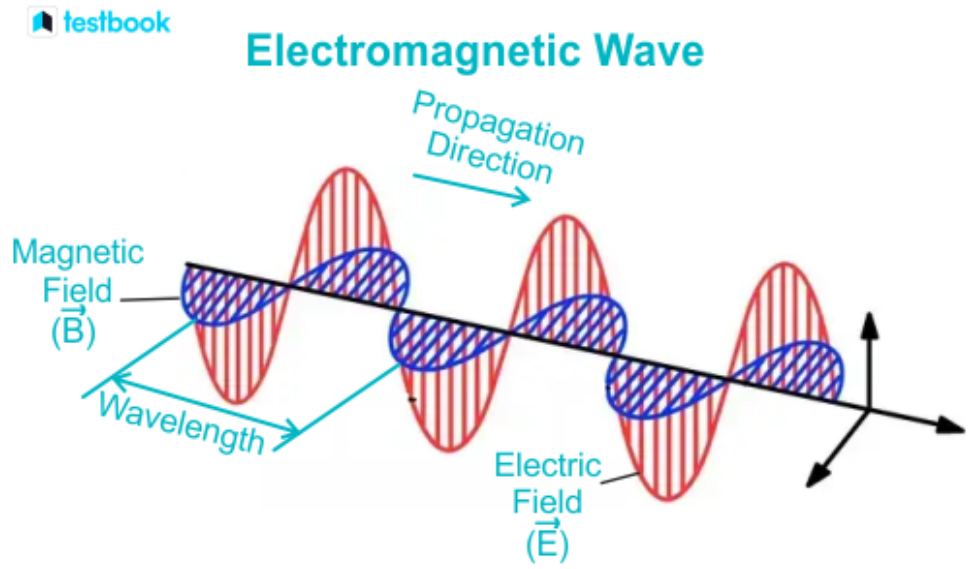
1.1 Electromagnetic Waves

There are waves made up of electric and magnetic vibrations. They transfer energy from one place to another.
All electromagnetic waves travel through space at the same time.
These waves are created as a result of vibrations between an electric field and a magnetic field.

Properties of electromagnetic waves:

- They travel at the same speed through space.
- They travel at the speed of light which is equal to 3 x 10^8 ms^{-1}.
- They are transverse waves.
- They obey the wave equation: $v=f\lambda$
- They can be reflected, refracted, and diffracted.
- They can undergo interference.
- They do not transfer matter.
- They transfer energy from one place to another.
- The energy transferred depends on the wavelength of the waves.

The wavelength of the electromagnetic waves has different effects.



How are electromagnetic waves produced?

1. Charged Particle Acceleration: The electric and magnetic fields surrounding a charged particle, like an electron, become unstable as it accelerates, decelerates, or changes direction.
2. Electric and magnetic fields that oscillate in response to this disturbance are perpendicular to one another and to the direction in which the wave is propagating.
3. Wave Propagation: These oscillating fields carry energy as they travel over space in the form of electromagnetic waves.