IIT-JEE / MEDICAL

PHYSICS

KEY TERMS

Electromagnetic Waves

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1. **Electromagnetic Waves.** A change electric field produces a changing magnetic field and vice versa which gives rise to a transverse wave known as electromagnetic wave.
2. **Transverse nature of E.M. wave**. The variation of election field ($\vec{E}$) and magnetic field ($\vec{B}$) are mutually perpendicular to each other as well as the direction of the propagation of the wave i e., **the electromagnetic waves are transverse in nature**.
3. **Intensity .** Intensity of a wave is defined as the energy passing per unit area per unit time perpendicular to the direction of propagation of the wave.
4. **Radiation pressure.** The force exerted per unit area of the surface is known as radiation pressure (P).
5. **Light vector.** The electric field vector $\vec{E}$ is responsible for the optical effects of electromagnetic waves. Therefore, electric field vector is called **light vector**.
6. **Poynting Vector.** Electromagnetic waves can transport energy. The rate of energy of e.m. wave transported per unit area is represented by a quantity called **Poynting vector** ($\vec{S}$).

$$\vec{S} = \frac{1}{\mu_0} \vec{E} \times \vec{B}$$

The direction of $\vec{S}$ at any point gives the direction of energy transport at that point.
Unit of Poynting vector is watt m^{-2}.
7. **Electromagnetic Spectrum.** The whole orderly range of frequencies/wavelengths of the electromagnetic waves is known as the electromagnetic spectrum.
8. **Microwaves.** Electromagnetic waves of frequency range 10^9 to 10^{13} H_z are known as **micro waves.**

Note : if any mistake on this, kindly inform on the mail id :

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