

UPDAAN



2025

LIGHT

- Reflection & Refraction

PHYSICS

Lecture – 01

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Topics to be covered



- 1 Basics of Light ✓
- 2 The Dual Nature of Light : Photon & Wave Theory
- 3 Reflection of Light : Laws
- 4 Object & Image (Technical Topics)
- 5



5-point principles (To Score 100 Marks)

1. Regularity → Notes → for data storage
2. Homework / Assignment
3. Test
4. Test Analysis
5. Revise

4 Chapters

1. Light (Numerical Based)
2. Human Eye and the Colorful World X
3. Electricity (Numerical + Theory)
4. Magnetic effects of Current X



Questions related to Mysterious Light



Q1. What is Light ?

Ans. It is a form of **Energy** which gives sensation of Vision

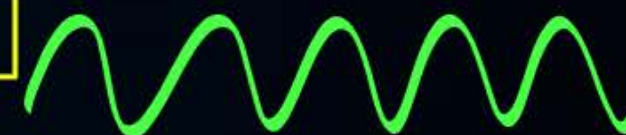
Q2. Is Light Itself Visible?

Ans. NO, otherwise Universe would not be black



Q3. is it a mechanical wave or non - mechanical wave?

Ans. **Non Mechanical Transverse** Wave, that is why **it travels in Vacuum**



Q4. What is Optics? How many types of Optics

Ans. **Study of light**, **Ray Optics** : **Particle Nature** of Light , **Wave Optics** : **Wave Nature** of Light

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Q5. What is Dual Nature of Light?

Ans. It shows two behaviours of two different conceptualisations :

Particle & Wave

observing Phenomenon like Reflection, Refraction & Interference,
Diffraction & Polarisation

Photon





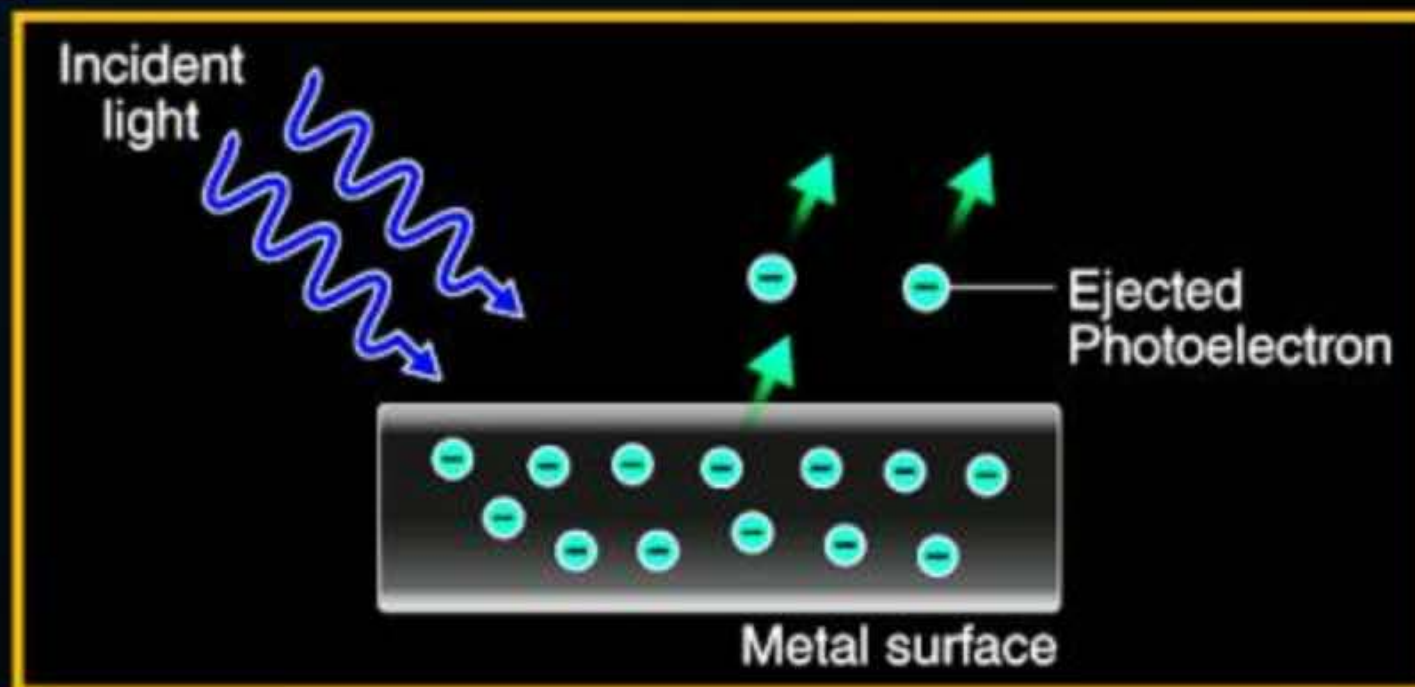
Particle Nature of Light



Newton's Corpuscles Theory :-

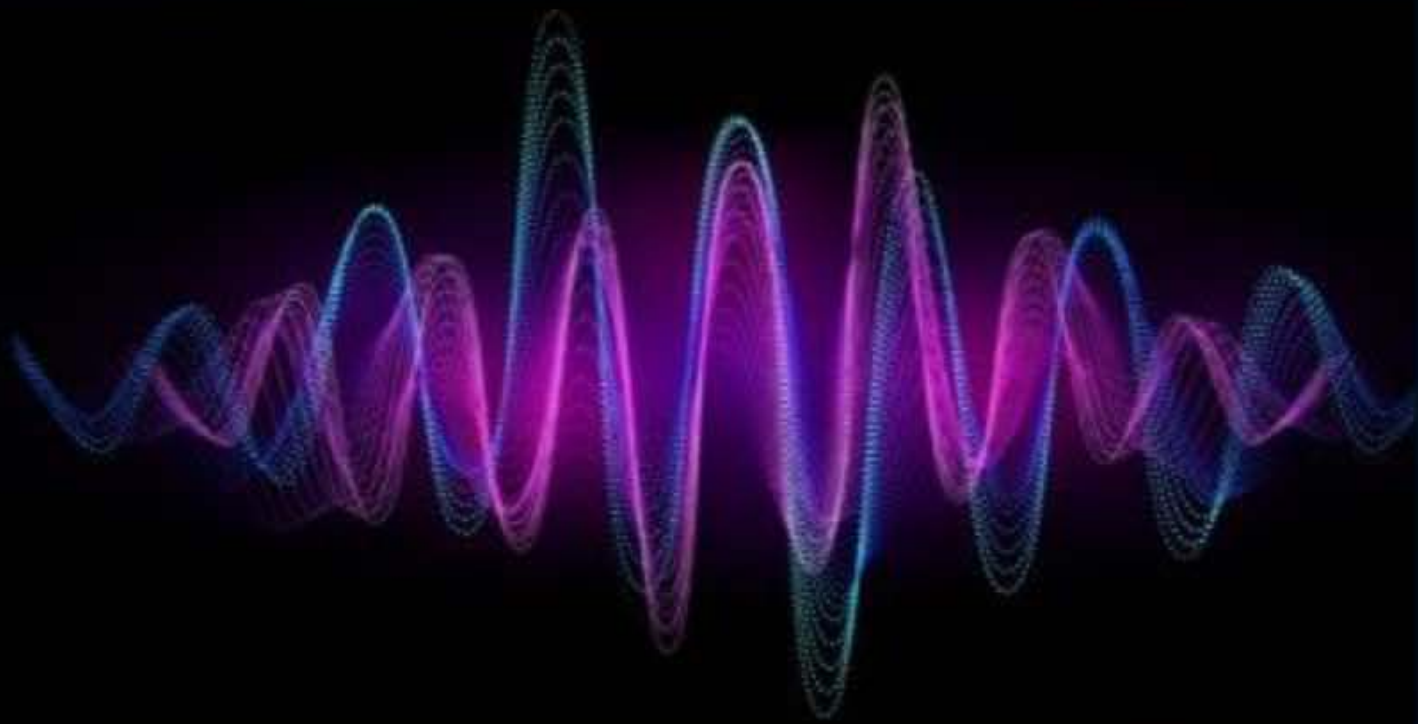


Photon Theory by Einstein :-





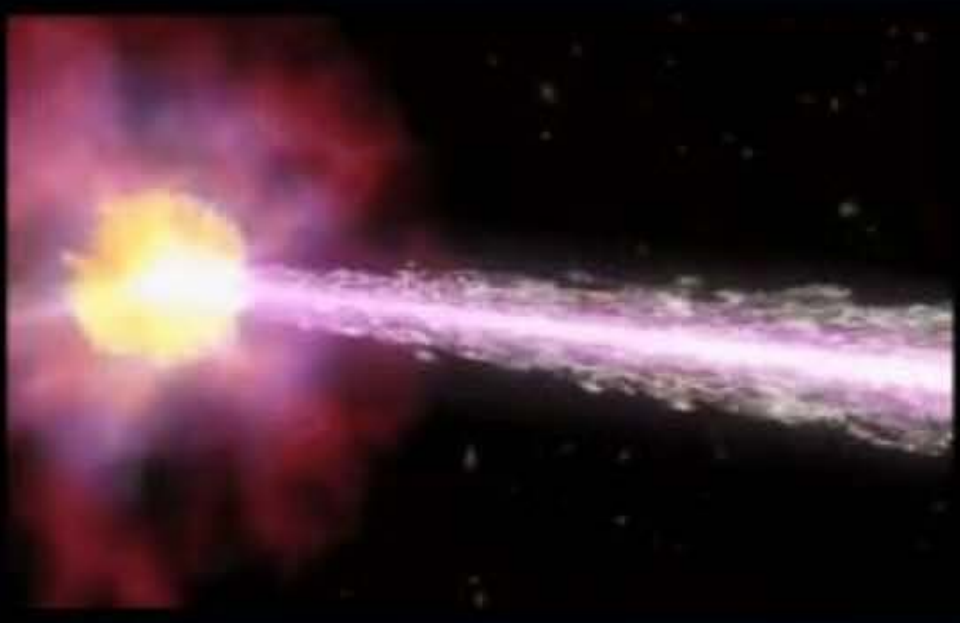
The Wave Theory : EM Wave



Light refers to electromagnetic radiation that can be detected by the human eye. The entire electromagnetic spectrum is extremely broad, ranging from low energy radio waves with wavelengths, shows properties such as **INTERFERENCE, DIFFRACTION & POLARISATION.**



Ray Nature of Light



- Light also has the property of a particle. The intensity of the light varies depending on the number of particles. Bright light has many particles while dark light has fewer particles. These particles of light are called “photons”
- Light travels at a speed of about 300,000 kilometers per second
* $(c = 3 \times 10^8 \text{ m/s})$. (Only in Vacuum/Air)
- When in a vacuum such as outer space where no matter is present, light travels straightforward, this is called Rectilinear Motion of Light
- Several Photons in a single line constitute a Light Ray
- Several Light Rays constitute a Beam of Light





Ray Nature of Light & Related Laws



➤ Law of Rectilinear Propagation of Light

Straight
forward

travel



➤ Law of Independence

When a ray travels in a line, it travels unaffected by other rays.



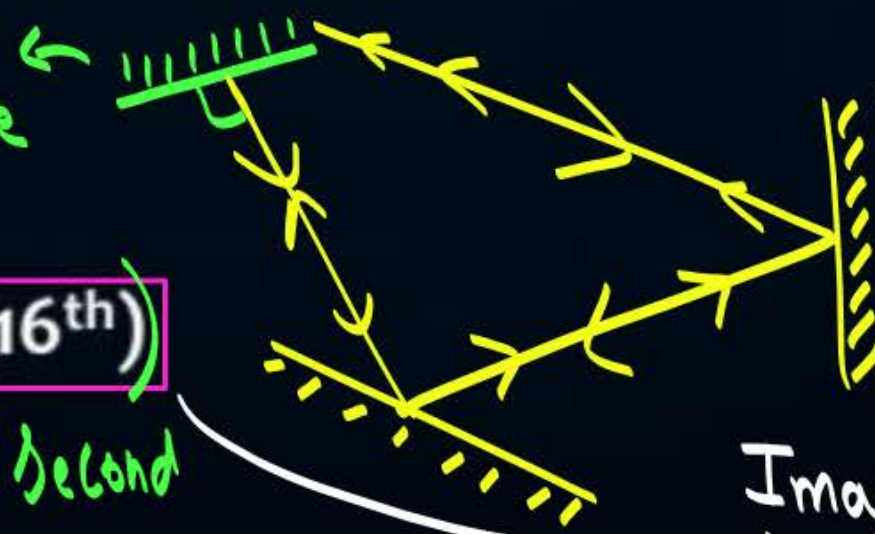
➤ Law of Reversibility of Light

➤ Law of Persistence of Vision ($\frac{1}{16}^{\text{th}}$)

Re/ Board Exam

second

Normal
Incidence



When light is normally incident on a mirror, it retraces its path.

Image formed on eye's retina persists for about $\frac{1}{16}$ second.



Permanant HOMEWORK



1. Notes Poore Karne hai ==



THANK
YOU

