

Handwritten notes in red ink, including the word "Optics" and other illegible text.

Handwritten text in red ink, possibly a date or page number.

B.Sc Part II (HONS)
Paper III, OPTICS

Handwritten text at the bottom of the page, possibly a signature or date.

Nature of light :-

Light is a form of energy which excites the retina of our eyes and creates an impression of seeing an object.

Several phenomena about light are known, -
For example :-

1. Transmission of light through vacuum.
2. Reflection
3. Refraction
4. Dispersion
5. Interference
6. Diffraction
7. Polarisation of light.

Phase difference :-

३५१०२१
Difference in phases is called phase difference. It is expressed in angles.

Path difference :-

५२५१०२१
Difference in paths is called path difference. It is expressed in distance.

Refractive index :-

It is the ratio of speed of light in vacuum and the speed of light in medium.
i.e. Refractive index, $\mu = \frac{\text{velocity of light in vacuum}}{\text{vel. of light in medium}} = \frac{c}{v}$

Optical Path :-

The optical path represents the distance, light travels in a vacuum in the same time it travels a distance d in the medium.

The path d of a ray of light in any medium is given by (the product of velocity \times time)

$$d = \text{velocity} \times \text{time} \\ = vt$$

$$\text{Since } \mu = \frac{c}{v}$$

$$\text{or } v = \frac{c}{\mu}$$

$$\therefore d = \frac{ct}{\mu}$$

$$\text{or } \mu d = ct$$

The product μd is called the optical path

Δ

$$\text{i.e. } \Delta = \mu d.$$

If a ray of light travels through a series of optical media of thickness d_1, d_2, d_3, \dots and refractive indices

$\mu_1, \mu_2, \mu_3, \dots$, the total optical path

is just the sum of the separate values

$$\Delta = \mu_1 d_1 + \mu_2 d_2 + \mu_3 d_3 + \dots$$

Interference;

When two or more wave trains act simultaneously on any particle in a medium the displacement of the particle at any instant is due to the superposition of all the wave trains. This phenomenon is called interference of light.

Young's Experiment:

