UNIT-I

OPTICS

B.SC. Sem-II

TOPIC - Two Beam interference by Fresnel's Method :- It refers to a technique where a single light source is split into two coherent beams using a special device called a "Fresnel biprism," which then allows the two beams to interfere with each other, creating a visible pattern of bright and dark fringe on the screen. It's a way to demonstrate light light interference by creating two virtual coherent light source from a single source using the refraction pattern properties of a biprism

Main point about Fresnel's Method :-

(1) Biprism Setup :-

A Fresnel biprism consists of two thin prism joined base to base, causing light rays from source to be slightly deflected, creating two virtual light sources that appears to be close together

Coherent light :

Since the two virtual sources originate from the same light source, the light waves are considered "coherent", meaning they have a constant phase relation ship.

Interference pattern

When these two coherent beams overlap on the screen, they interfere with each other, producing a pattern of

bright and dark fringe due to construtive and dark fringes due to constructive and destructive interference.

Application :

This method is commonly used in physics labs to measure the wavelength of light, as fringe spacing is directly related to the wavelength.

How it works :

(1) Light source

A monochromatic light source is placed in front of the Fresnel biprism

2 Virtual Sources :-

The light rays passing through the biprism are refracted, creating two virtual image of the original source which acts as coherent light sources.

3. Interference pattern

The light waves from these virtual sources, then spread out and overlap on a screen, forming a visible interference pattern of bright and dark fringe.