B. Tech [First Semester]
EXAMINATION 2019]
ENGINEERING PHYSICS

5⇒ How is a concave Reflection grating superior over a plane diffraction grating?

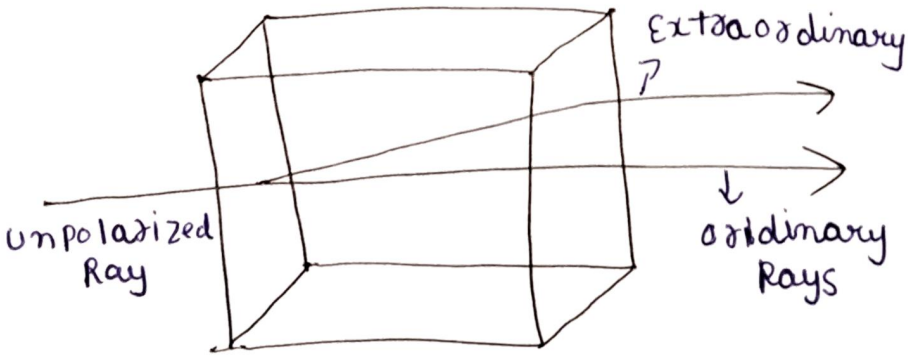
Plane gratings are flat and are more common than concave gratings. They are Benfical Because their focal properties are wavelength Independent

Concave Reflection gratings have several advantages over plane diffraction grathings

FOCUSing
Eliminates Chromatic aberration
Compacts Instrument design
Sharp spectral ~~lines~~ lines
wave length - depend focal property.

6⇒ What do you mean by double ~~Reflection~~ Refraction?

It the phenomena due to which Beam of oridanary ~~up~~ unpolized light is made to pass through a ~~q rautaz~~ crystals or calcite crystals or calcite crystal the two Refracted Rays are produced the property is called Double Refraction.



Q. What do you mean by Population Inversion?

Ans⇒ Population Inversion is a state in which more atoms in a system are higher Energy state than a lower Energy state.

Population Inversion is a fundamental concept in a laser science Because It's a necessary step in process of generating laser, when beam of light passes through an amplifer in a state of population inversion more photons are stimulated than absorbed which amplifers the Beam.

Explain the principle of holography?

→ It the method in which one not only Record the amplitude But also the phase of light wave.

→ It is the lenseless photography in which the Image of an object captured not as the focused on the flim but at as an Interference pattern at the flim but obtained by Interference b/w the coherent light (from a loser) Refleded from the object Combined the flim with light from a coherent Refrana Beam obtained by splitting the light from the Same (light) lo Ser source This Recorded Interference Pattern called Hologram

Q:- What are the properties of laser Radition?

Ans=> ~~Ans~~

Coherence:-> A conventional light source such as an incandescent lamp or a nature source such as the sun produced incoherent light ~~source~~ ~~source~~ sources, they emit Random wavelength light waves with no common phase Relationship on the other hand the wave emitted by laser source will the phase and are same frequency.

Directionality → The conventionally source emit light all Direction laser emit light only one direction the Photo traveling along the same direction laser Beams highly directional

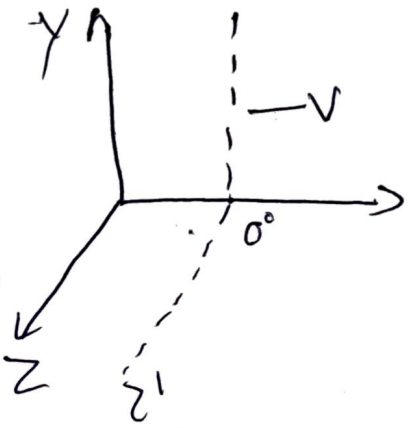
High Intensity → The Intensity of light is defined as the Energy passing through a point normal to direction of flow per unit area I Second The Intensity of distance r from source is

$$I = \frac{P}{4\pi R^2}$$ where P is the power source.

Monochromaticity The light from monochromatic source Spread over wavelength Range of the 100A to 1000A But laser light is highly monochromatic

Q-> Discuss Lorentz transformation?

let S' and S are two Inertial frame of Refrance S at Rest S' is moving with constant velocity V along postive (+ve)



$x' \propto (x - vt)$

$x' = x(x - vt) \quad -(1)$

$x = k(x^2 + vt^2) \quad -(2)$

$x = k(k(x - vt) + vt^2) \quad -(2)$

$x = k(kx - kvt + vt^2) \quad -(3)$

$\frac{x}{k} = kx + kvt = vt$

$t' = \frac{k}{k} + \frac{x}{kv} - \frac{kv}{kv} + kt$

$t' = kt - \frac{kx}{v}\left(1 - \frac{1}{k^2}\right) \quad -(3)$