

Chapter	8 Physical Optics and Gravitational Waves	Class	1 st Year	Subject	Physics
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Give Short Answers of the Following Questions

1. Why are the polaroid sunglasses better than the ordinary sunglasses?

Ans.

- Polaroid sunglasses pass small light having specific planes of vibration.
- Polarized sunglasses reduce glare.
- They protect the eyes from bright rays of sun light.
- Polaroid sun glasses blot out only the harmful glares.

2. Is light from the sky partially polarized? How is it so?

Ans. Yes, light from the sky is partially polarized.

Reason

The polarization of light from the sky is due to scattering. When sunlight enters the Earth atmosphere, it interacts with tiny molecules. During the scattering process, the light waves are scattered in all directions, but the scattered light is partially polarized.

The polarization occurs because the scattered light waves are oscillating perpendicular to the plane of incidence (the plane containing the incident and scattered light rays).

3. How is Malus's law used in everyday life?

Ans. Applications

- 1. Reducing Glare:** When driving, polarized sunglasses can reduce glare from the road, making it easier to see.
 - 2. Enhancing Colors:** Polarizing filters in photography can enhance the colors of a sunset or reduce haze in a landscape.
 - 3. Improving Screen Visibility:** Polarized screens on devices, like smartphones or tablets, can reduce glare and improve visibility in bright environments.
- Malus's law plays an important role in different technologies, reducing glare and improving visibility.

4. What are the applications of Brewster's angle?

Ans. Brewster's angle, which is the angle at which light with a particular polarization is perfectly transmitted through a surface, has several practical applications:

Applications:

- 1. Reducing Glare:** Car windshields and sunglasses often use coatings that incorporate Brewster's angle to reduce glare.
- 2. Improving Laser Efficiency:** Laser manufacturers use Brewster's angle to optimize laser design and minimize reflection losses.
- 3. Enhancing Microscopic Images:** Microscopists use polarized light, created using Brewster's angle, to enhance contrast and reduce glare in microscopic images.

5. What is the space-time curvature?

Ans. Space-time is the fabric that combines space and time, describing the universe as a four-dimensional entity. Every event in the universe is embedded in this fabric, which is curved by the presence of mass and energy. According to General Relativity, the presence of mass and

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energy warps the fabric of space-time, creating curvature. This curvature affects not only objects with mass but also the path of light.