Physics - FSC Part 1 Physics Chapter 9 Short Questions Preparation

Q1. What is the usual way to obtain plane wavefront from a point source?

Ans 1: A usual way to obtain a plane wavefront is to place a point source of light at the focus of a convex lens. The rays coming out of the lens will constitute plane waves.

Q2. What do you mean by coherent source ? Explain a common method for producing two coherent sources.

Ans 1: The monochromatic sources of light which emit waves, having a constant phase difference are called coherent sources. A common method of producing two coherent light beams is to use a monochromatic source to illuminate a screen containing two small holes, usually in the shape of slits. The light emerging from the two slits is coherent because a single source produces the original beam and two slits serve only too split it into two parts.

Q3. How can the distance between interference fringes affect by the separation between the slits of young's experiment? Can fringes disappear?

Ans 1:

Q4. If white light is incident on a film of irregular thickness at all possible angles,what will be the pattern of interference fringes? Explain your answer.

Ans 1: If white light is incident on a film of irregular thickness at all possible angles, we should consider the interference pattern due to each spectral colour separately. If at a certain place condition of destructive interference of one colour is satisfied then that portion of film will exhibit the remaining constituent colours of white light.

Q5. Why diffraction grating cannot be used for X-Rays diffraction?

Ans 1: In order to observe the effects of diffraction, the grating spacing must be of the order of wavelength of the incident light.
X-rays are of much shorter wavelength of the order of 10^{-10} M
The regular array of atoms in a crystal forms a natural diffraction grating with spacing $=10^{-10}$ M.Which is not available in other diffraction grating.

Q6. What condition must be met by interfering beams to observe the phenomena of interference?

Ans 1: The following conditions must be met, in order to observe the phenomenon.

1. The interfering beams must be monochromatic, that is, of a single wavelength.
2. The interfering beams of light must be coherent.

Q7. What is diffraction of light?

Ans 1: The slight bending of light as it passes around the edge of an object is called diffraction of light.

Q8. In Newton's rings, Why are the fringes circular?

Ans 1: The thickness of the air film between plano-convex lens and plane glass plate is almost zero at the point of contact "o" and gradually increases as we proceed towards the periphery of the lens. Thus, points where the thickness of air film is constant will lie on a circle with "o" as centre. That is why circular fringes are produced.

Q9. In Newton's rings, Why are the fringes circular?

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Q10. What is difference between interference and diffraction fringes?

Ans 1: Interference Fringes: The superposition of two waves having same frequency and travelling in same direction results in bright and dark fringes is called interference fringes.

Diffraction Fringes: The fringes formed due to the bending of light around edges and corners are called diffraction fringes.
