IMPORTANT QUESTIONS

Q.1 What do you mean by interference of light? Give the conditions of interference of light wave.

(1992, 1995, 1997, 2002, 2003)

Q.2 Discuss young's double-slit experiment to measure the wave length of light.

(1992, 1995, 1998, 2000, 2002P.E, 2005, 2006, 2008, 2009, 2010, 2011)

Q.3 Write short notes on any two of the following.

(i) Wave front and Huygen's principle *(1992, 1993, 1999)*

(ii) Polarization of light. *(1992, 1993, 1999)*

(iii) Diffraction grating *(1993, 1995, 2000)*

(iv) Interference in the thin films. *(1995)*

(v) Michelson Interferometer *(2000)*

Q.4 What are Newton's rings? Show how Newton's rings can be used to find the radius of curvature of a lens.

(1994, 1997, 1999, 2001, 2003P.M, 2007)

Q.5 What is a diffraction grating? How is it used to determine the wave length of light? *(1996, 1998, 2001, 2003P.E, 2006, 2007, Suppl. 2009)*

Q.6 Give the construction and working of the Michelson interferometer. How is it used to determine the wave length of a monochromatic light?

(2002P.E, 2002P.M, 2002)

Q.7 Differentiate between the following.

(i) Fresnel and Fraunhofer diffraction. *(1996, 2002P.E, 2004, 2008)*

(ii) Constructive and Destructive interference *(2002P.E)*

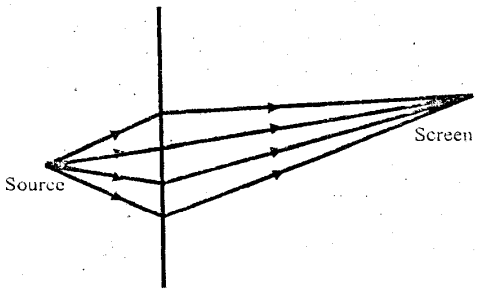
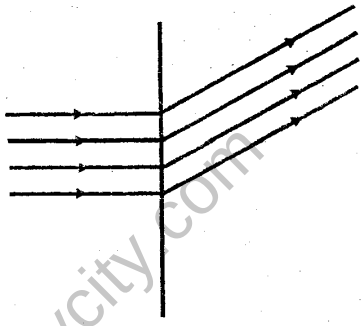
(iii) Interference and diffraction *(2003P.M, 2003P.E)*

Q.8 Derive Bragg's law for x-rays diffraction? *(2004) 2008*

Q.9 Why are X-rays not diffracted by diffraction grating or thin film. *(2011)*

Q.10 Describe Yong's double slit experiment. Derive the relevant expression and the formula for fringe spacing. *(2011, 2013)*

Interference	Diffraction
(1) Interference is due to interaction of light coming from two different wave fronts originating from the same source.	(1) Diffraction is due to interaction of light coming from different parts of the same wave front.
(2) Interference fringes are of the same width.	(2) Diffraction fringes are not of the same width.
(3) All bright fringes are of the same Intensity.	(3) All bright fringes are not of the same intensity.
(4) All point of minimum intensity are perfectly dark.	(4) All point of minimum intensity are not perfectly dark.
(5) The spacing between fringes is uniform.	(5) The spacing between fringes is not uniform.

Fresnel Diffraction	Frounhofer Diffraction
(1) If the source of light and screen are at finite distance from the obstacle, then the diffraction is called Fresnel diffraction. 	(1) If the source of light and screen are at infinite distance from the obstacle then the diffraction is called Fraunhofer diffraction. 
(2) The corresponding rays are not parallel.	(2) The corresponding rays are parallel to each other.
(3) The wave fronts falling on the obstacle are not plane.	(3) The wave fronts falling on the obstacle are plane

Constructive Interference	Destructive Interference
(1) That interference in which the two waves reinforce each other is called constructive interference.	(1) That interference in which the two waves cancel each other is called destructive interference.
(2) The amplitude of the resultant wave is greater than either of the individual waves.	(2) The amplitude of the resultant wave is less than either of the individual waves.
(3) The constructive interference takes place when path difference between the two waves is: $0, \lambda, 2\lambda, 3\lambda, \ldots\ldots\ldots\ldots m\lambda$	(3) The constructive interference takes place when path difference between two waves is: $\lambda/2, \frac{3\lambda}{2}, \frac{5\lambda}{2} \ldots\ldots \left(m + \frac{1}{2}\right)\lambda$