SHIKSHA CLASSES

BOARD QUESTION PAPER

Subject : Physics **Topic: 7. Wave Optics** **Total Marks : 20**
Class : XII **Time : 1 Hr.**

Section (A)

Q.1 : Select and write the most appropriate answer from given alternatives in each sub-question. **5**

i) If the two waves represented by $y_1 = 4\sin\omega t$ and $y_2 = 3\sin(\omega t + \frac{\pi}{3})$ interfere at a point, the amplitude of the resulting wave will be about…

a) 7 b) 6 c) 1.6 d) 3.5

ii) The light of wavelength 6328 A^0 is incident on a slit of width 0.20 mm perpendicularly; the angular fridge width will be

a) 0.36^0 b) 0.18^0 c) 0.72^0 d) 0.09^0

iii) If the ratio of maximum and minimum intensities of an interference pattern is 36:1, then the ratio of amplitude of two interfering waves will be..

a) 3:7 b) 7:4 c) 4:7 d) 7:5

iv) In Young's double slit experiment, if the distance between the slit is halved and the distance between slit and the screen is doubled, the fringe width becomes.

a) Half b) Double c) Four times d) Eight times

v) In the interference pattern by two identical slits, intensity of central maxima is I. if one of two slits is closed, the intensity of light at the same spot will be…

a) I b) I/4 c) 2I d) 4I

Q.2 : Very short answers type questions. **2**

i) What is the primary and secondary source of light?

ii) What is mean by coherent sources?

Section (B)

: Attempt any THREE. **6**

Q.3 : What are the conditions for obtaining good interference pattern?

Q.4 : State Huygen's principle.

Q.5 : In the Young's double slit using monochromatic light of wavelength λ, the intensity of light at a point on the screen where path difference is λ, k is units. What is the intensity of light at point where path difference is $\frac{\lambda}{3}$?

Q.6 : Plane wave front of light of wavelength 6000 A^0 is incident on two slits in a screen perpendicular to the direction of light rays. If the total separation of 10 bright fringes on a screen 2 m always is 2 cm, find the distance between the slits.

Section (C)

: Attempt any one of following. **3**

Q.7 : Drive the laws of refraction of light using Huygens's principle.

Q.8 : In a single slit diffraction experiment first minimum for a light of wavelength 6800 A^0 coincides with first maximum of some other unknown wavelength. Calculate unknown wavelength.

Section (D)

: Attempt any one. **4**

Q.9 : i) Derive an expression for the width of the central maxima for diffraction of light at a single slit. How does this width change with increase in width of the slit?

ii) The intensity of polarized light becomes 1/20 th of its initial intensity after passing through analyzer .what is the angle between the axis of the analyzer and the initial amplitude of the beam?

Q.10: i) What is the Brewster's law? Derive the formula of Brewster angle.

ii) A slit of width 'a' is illuminated by the light of wavelength 6000 A^0. For what value of 'a' will the when maximum fall at an angle of diffraction of 30^o?

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