INTERNATIONAL INDIAN SCHOOL BURAIDAH

CLASS:XII SUBJECT: PHYSICS

LESSON : Wave Optics

1. How will the interference pattern in Young's double slit experiment get affected, when

(i) distance between the slits S, and S, reduced. (ii) the entire set-up is immersed in water? Justify your answer in each case.(Delhi 2011)

2. (a) The interference pattern is not observed in Young's double slit experiment when the two sources S_1 and S_2 are far apart. Explain.

(b) Mention the conditions for the two sources to be coherent.

(c) What is the effect on the interference pattern in a Young's double slit experiment, if the source of wavelength λ is replaced by another source of wavelength 1.5 λ, with interference pattern still observable? (CBSE 2022,)

3. What is the effect on the interference fringes in a Young's double slit experiment, if the monochromatic source S is replaced by a source of white light? (CBSE 2023)

4. Write two points of difference between an interference pattern and a diffraction pattern.

5. What is the effect on the interference fringes in Young's double slit experiment when the width of the source slit is increased

6.a) In a Young's double slit experiment the separation between the two slits is d and distance of the screen from the slits is 1000d. If the first minima falls at a distance d from the central maximum. Obtain the relation between d and λ.

b) When a tiny circular obstacle is placed in the path of light from a distant source, a bright spot is seen at the centre of the obstacle. Explain, why? (CBSE 2023)

7. In a single slit diffraction experiment, the width of the slit is decreased. How will the (a) size and (b) intensity of the central bright band be affected? Justify your answer. (Delhi 2020)

8. What should be the width of each slit to obtain n-maxima of double slit pattern within the central maxima of single sit pattern?

9. Explain how the intensity of diffraction pattern changes as the order(n) of the diffraction band varies?

10. A parallel beam of light of 500 nm falls on a narrow slit and the resulting diffraction pattern is observed on a screen 1 m away. It is observed that the first minima is at a distance of 2.5 mm from the centre of the screen. Calculate the width of the slit.