Worksheet: Wave Optics

ISC · Class 12 · Physics · 9 questions · 27 marks

Name: _____ Date: _____ Score: _____ / 27

Q1. Light of wavelength 600 nm in air enters a medium of refractive index 1.5. Find its wavelength and speed in the medium. *[2 marks]*

Q2. In a double-slit experiment the slits are 0.5 mm apart and the screen is 1.0 m away. Find the fringe separation for light of wavelength 500 nm. *[2 marks]*

Q3. Unpolarised light of intensity I falls on two polaroids whose pass axes are parallel. Find the intensity transmitted. *[2 marks]*

Q4. In a double-slit experiment the fringe separation is 0.6 mm. What happens to it if the screen distance is doubled and the slit separation is halved? *[3 marks]*

Q5. Plane polarised light of intensity 40 W/m squared falls on a polaroid whose pass axis is at 60 degrees to the plane of polarisation. Find the transmitted intensity. *[3 marks]*

Q6. Light of wavelength 500 nm falls on a slit of width 0.2 mm. Find the angular half-width of the central maximum. *[3 marks]*

Q7. In a two-slit pattern the maximum intensity is I_max. Find the intensity at a point where the path difference is lambda/4. *[4 marks]*

Q8. A slit of width 0.1 mm is illuminated by light of wavelength 600 nm and the pattern is viewed on a screen 2.0 m away. Find the linear width of the central maximum. *[4 marks]*

Q9. Two wavelengths 480 nm and 600 nm illuminate a double slit. Which orders of the two coincide first away from the centre? *[4 marks]*