

1.

a) Describe what is meant by two wave sources being in phase or out of phase. /1

b) Explain why light from an incandescent source is neither coherent nor monochromatic. /2

c) Describe constructive and destructive interference in terms of the principle of superposition. /1

d) Describe diffraction of light by a narrow slit, where the width of the slit is about the same size as the wavelength. /2

2. Explain why a single slit is used before a double slit for two-slit interference when the light source used is not coherent. /2

3. Draw an intensity distribution of the pattern caused by a two-slit interference apparatus for monochromatic light and explain why it looks the way it does. /2

4.

a) Calculate the wavelength of light required for two slit interference to produce first order maxima at 5.0° if the slits are 1.1×10^{-6} m apart. /2

b) If the pattern illuminates a screen 5 m away, determine the distance between the maxima. /2