



- 4 (a) Low-pressure vapour in a lamp emits monochromatic light that is not coherent.

(i) State what is meant by *coherent* light.

.....  
 ..... [1]

(ii) Explain, by reference to the mechanism by which the vapour produces light, why the emitted light is not coherent.

.....  
 .....  
 ..... [2]

- (b) A student wishes to measure the separation of two narrow parallel slits. A beam of laser light of wavelength 633 nm is directed normally at the plane of the slits. The light emerging from the slits is viewed on a screen placed 2.95 m away from the slits.

Part of the fringe pattern observed on the screen, together with a measurement for the width of some fringes, is shown in Fig. 4.1.

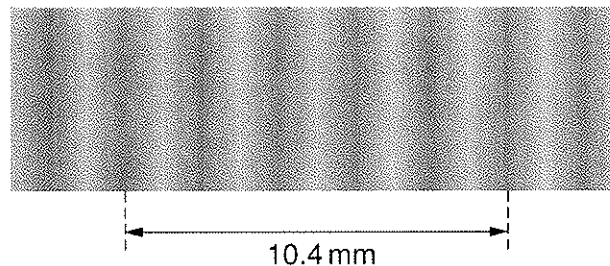


Fig. 4.1 (not to scale)

Determine the separation, in mm, of the slits.

separation = ..... mm [4]