



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

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

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[1]

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

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[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.

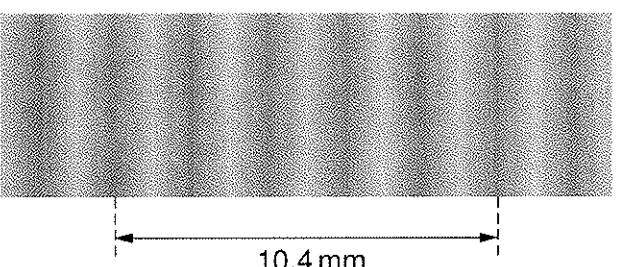


Fig. 4.1 (not to scale)

Determine the separation, in mm, of the slits.

$$\text{separation} = \dots \text{mm} \quad [4]$$