

6 Fig. 6.1 shows wavefronts incident on, and emerging from, a double slit arrangement.

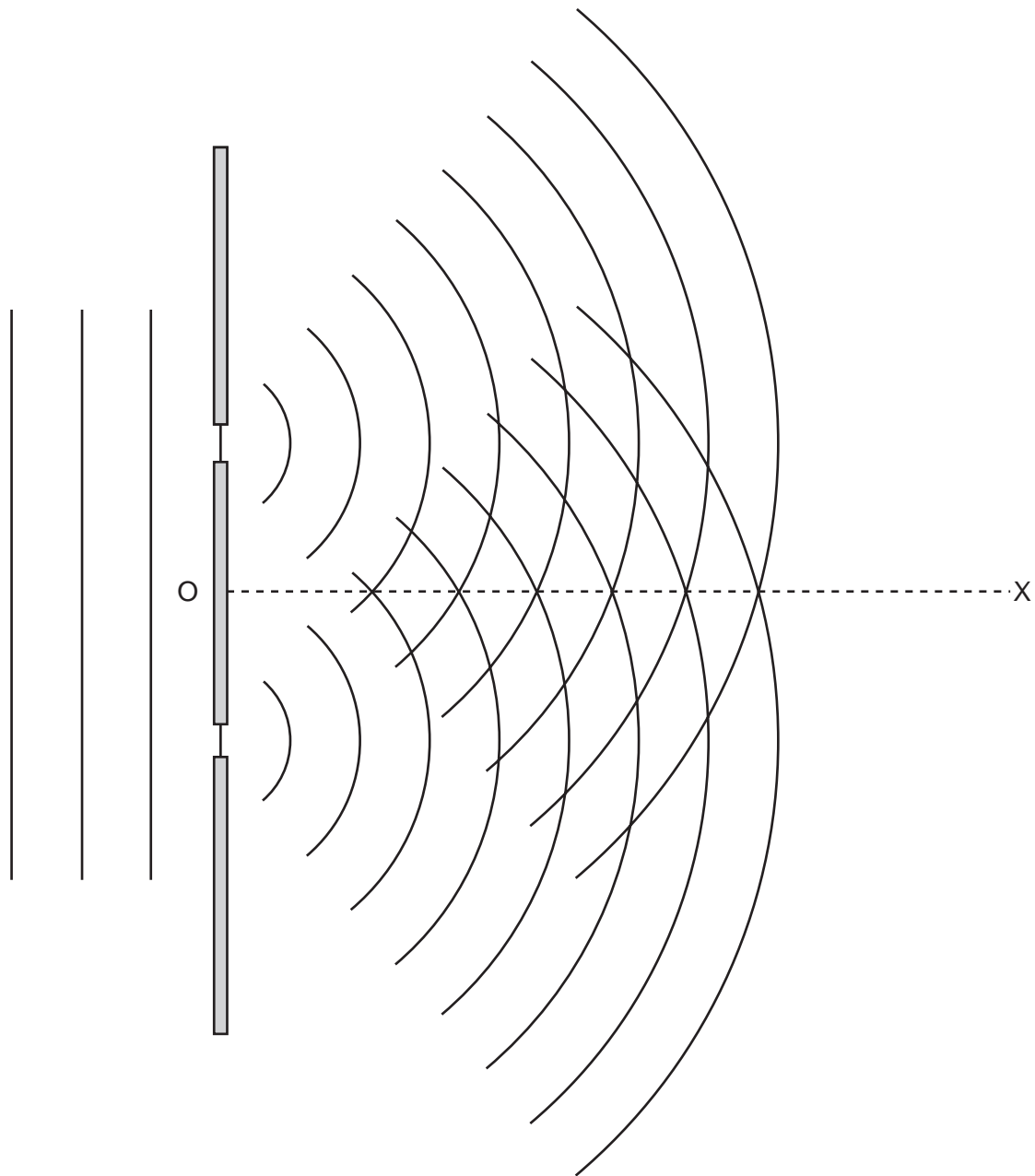


Fig. 6.1

The wavefronts represent successive crests of the wave. The line OX shows one direction along which constructive interference may be observed.

(a) State the principle of superposition.

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..... [3]

(b) On Fig. 6.1, draw lines to show

- (i) a second direction along which constructive interference may be observed (label this line CC),
- (ii) a direction along which destructive interference may be observed (label this line DD).

[2]

(c) Light of wavelength 650 nm is incident normally on a double slit arrangement. The interference fringes formed are viewed on a screen placed parallel to and 1.2 m from the plane of the double slit, as shown in Fig. 6.2.

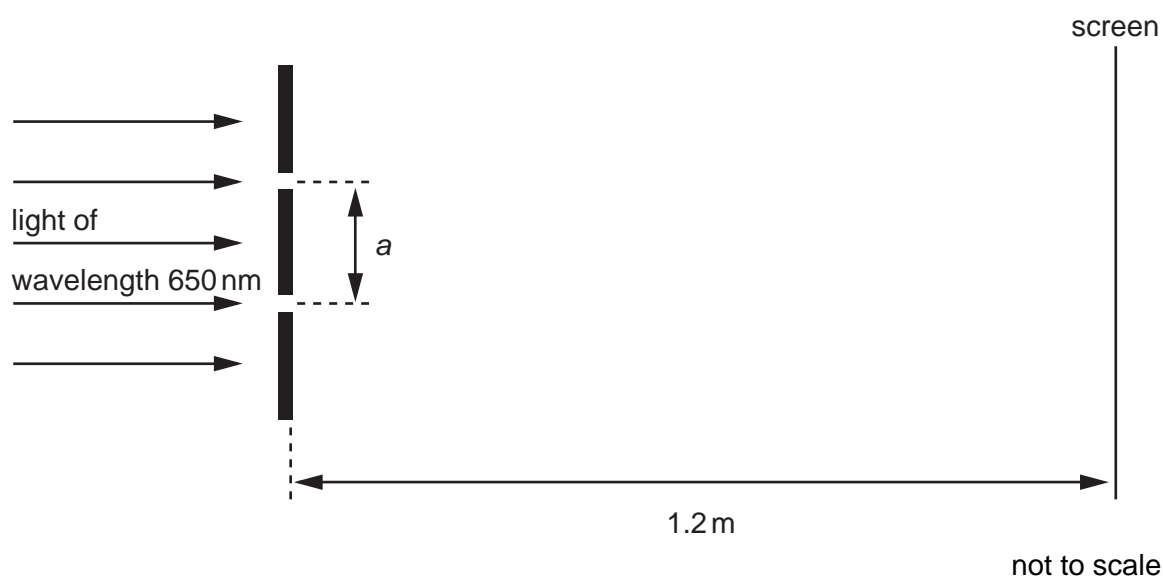


Fig. 6.2

The fringe separation is 0.70 mm.

- (i) Calculate the separation a of the slits.

separation = m [3]

- (ii) The width of both slits is increased without changing their separation a . State the effect, if any, that this change has on

1. the separation of the fringes,

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2. the brightness of the light fringes,

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3. the brightness of the dark fringes.

.....

[3]