

- 4 (a) State the principle of superposition.

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[2]

- (b) Two waves, with intensities  $I$  and  $4I$ , superpose. The waves have the same frequency.

Determine, in terms of  $I$ , the maximum possible intensity of the resulting wave.

$$\text{maximum intensity} = \dots \dots \dots I [2]$$

- (c) Coherent light of wavelength 550 nm is incident normally on a double slit of slit separation 0.35 mm. A series of bright and dark fringes forms on a screen placed a distance of 1.2 m from the double slit, as shown in Fig. 4.1. The screen is parallel to the double slit.

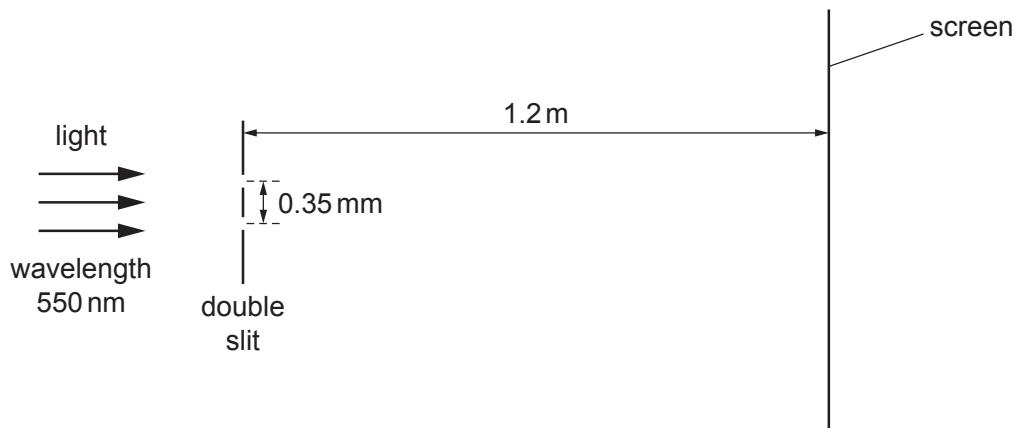


Fig. 4.1 (not to scale)

- (i) Determine the distance between the centres of adjacent bright fringes on the screen.

distance = ..... m [3]

- (ii) The light of wavelength 550 nm is replaced with red light of a single frequency.

State and explain the change, if any, in the distance between the centres of adjacent bright fringes.

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