5 Source S_1, consisting of parallel light with wavelength 700 nm, is incident on a rectangular slit of width *b*, as shown in Fig. 5.1.

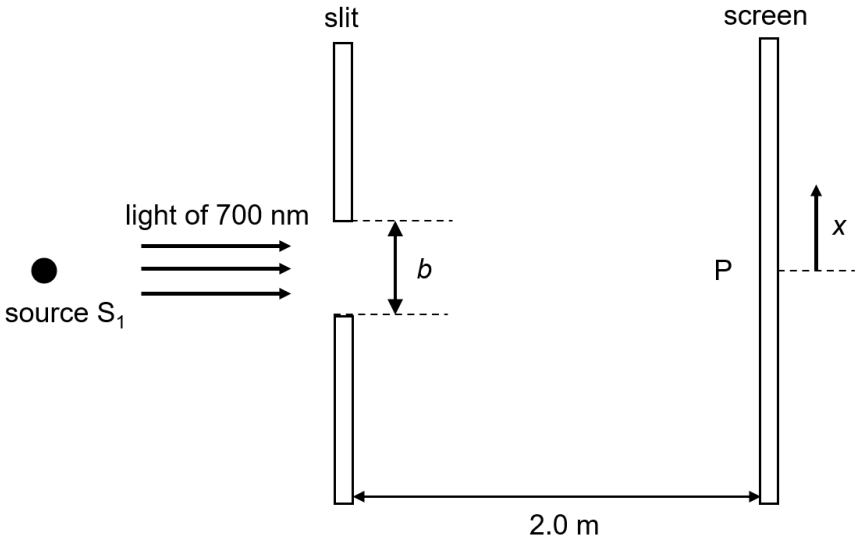

Fig. 5.1 (not to scale)

(a) A central maxima is observed on the screen and its width is found to be 4.0 mm. Calculate the width *b* of the single slit.

slit width *b* = ... m [2]

(b) Fig. 5.2 shows the variation with distance *x* from P of the intensity I of the red light on the screen. Label, on Fig. 5.2, the values of the six *x*-intercepts. [2]

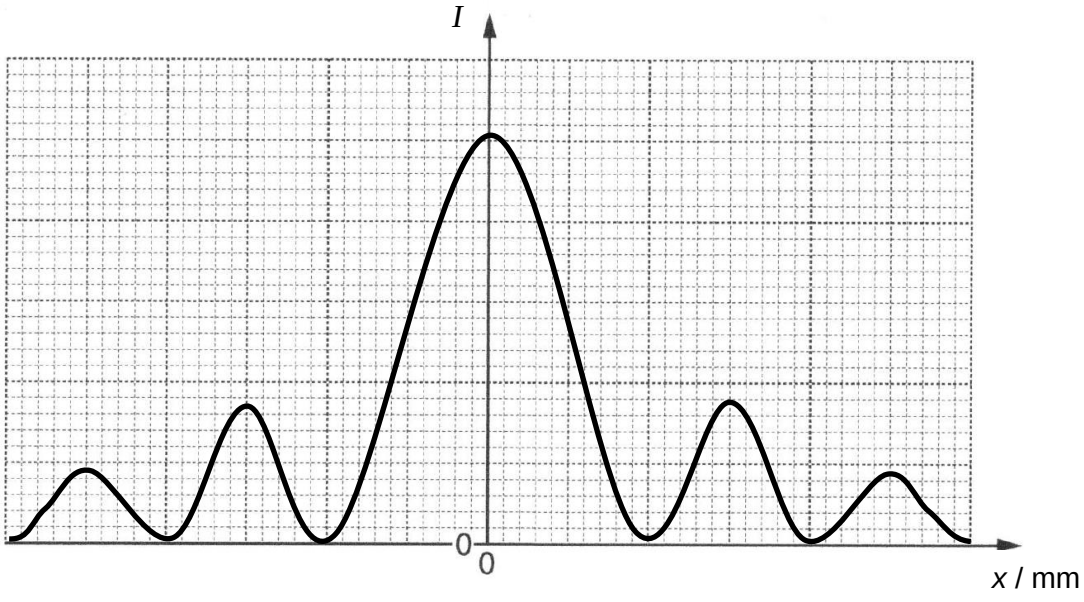

Fig. 5.2

(c) Another identical point source S_2 is placed close to S_1 as shown in Fig. 5.3.

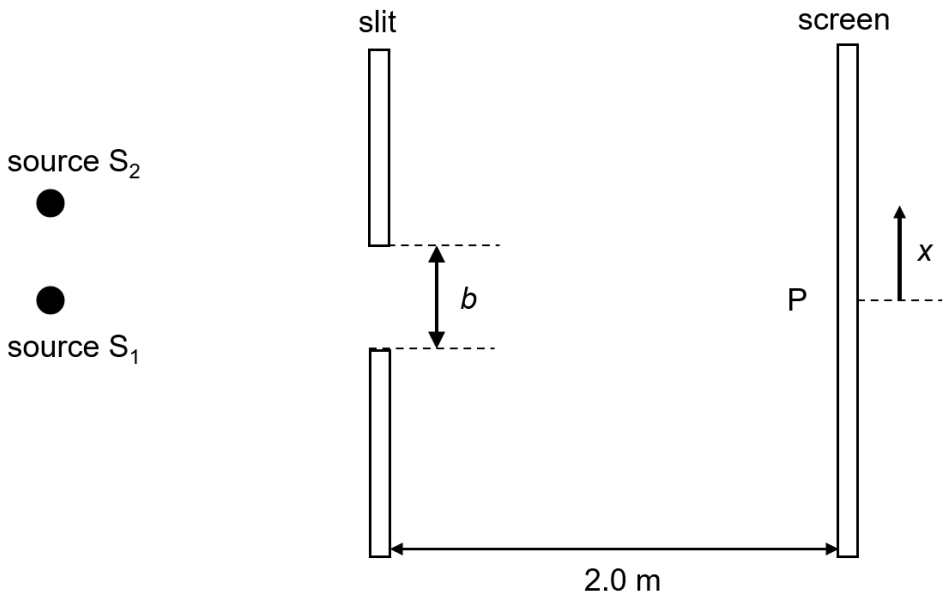

Fig. 5.3 (not to scale)

Sketch, on Fig. 5.2, the variation with distance x from P of the intensity I of the second source S_2 when Rayleigh criterion is satisfied. [2]

[Total: 6]