6 **(a)** A laser is used to produce an interference pattern on a screen, as shown in Fig. 6.1.
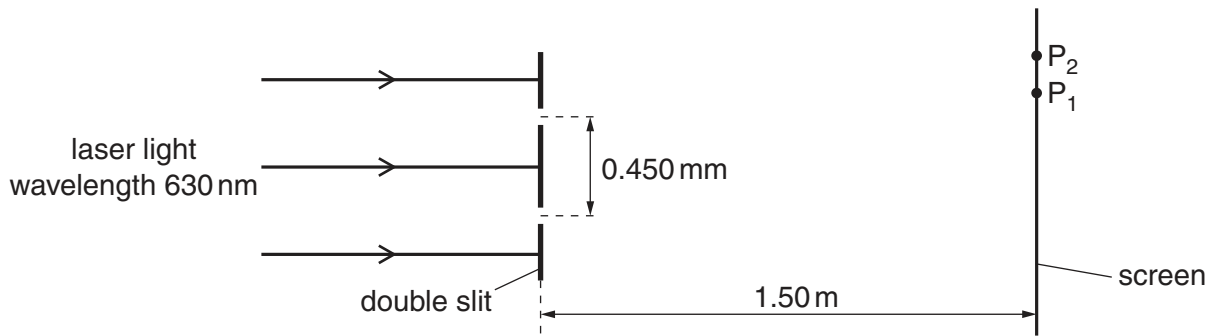

Fig. 6.1 (not to scale)

The laser emits light of wavelength 630 nm. The slit separation is 0.450 mm. The distance between the slits and the screen is 1.50 m. A maximum is formed at P_1 and a minimum is formed at P_2.
Interference fringes are observed only when the light from the slits is coherent.

(i) Explain what is meant by *coherence*.

....

....

....[2]

(ii) Explain how an interference maximum is formed at P_1.

....

....[1]

(iii) Explain how an interference minimum is formed at P_2.

....

....[1]

(iv) Calculate the fringe separation.

fringe separation = ... m [3]

(b) State the effects, if any, on the fringes when the amplitude of the waves incident on the double slits is increased.

....

....

....

....[3]