**4** Coherent light of wavelength 590 nm is incident normally on a double slit, as shown in Fig. 4.1.

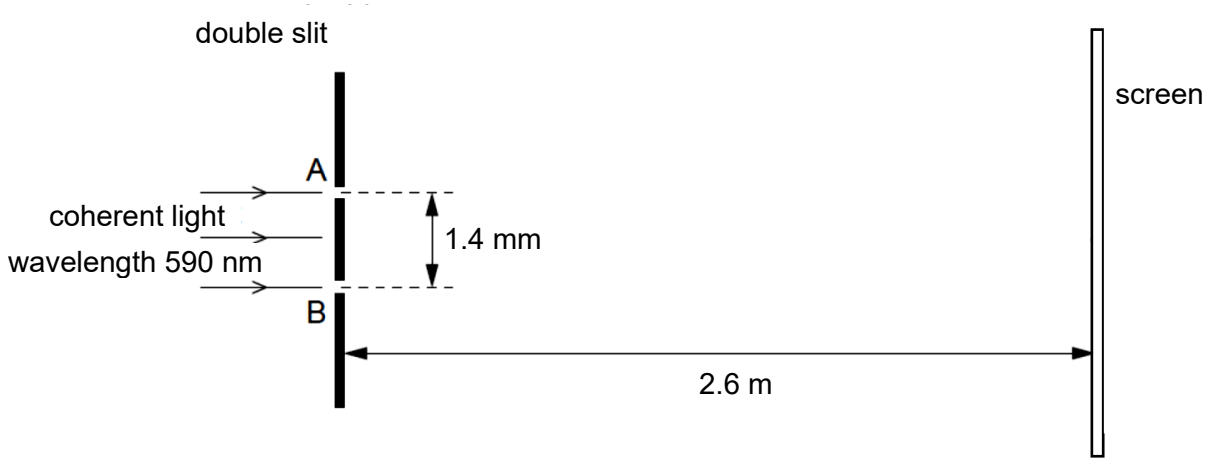


**Fig. 4.1**

The separation of the slits A and B is 1.4 mm and the width of each slit is 0.15mm. A screen is placed parallel to the slits at a distance 2.6 m away.

**(a)** One of the slits is covered.

Calculate the width of the central maximum formed on the screen by diffraction through the uncovered slit.

width = ..... cm [3]

**(b)** Now, both slits are uncovered.

**(i)** State Rayleigh's criterion.

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[2]

**(ii)** Use Rayleigh's criterion to explain whether the diffraction pattern produced by the two slits are seen as on the screen as separate.

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[3]

[Total: 8]