

- 3 (a) Describe what is meant by a *polarised* wave.

[2]

- (b) A narrow beam of light is incident on three ideal polarising filters A, B and C as illustrated in Fig. 3.1.

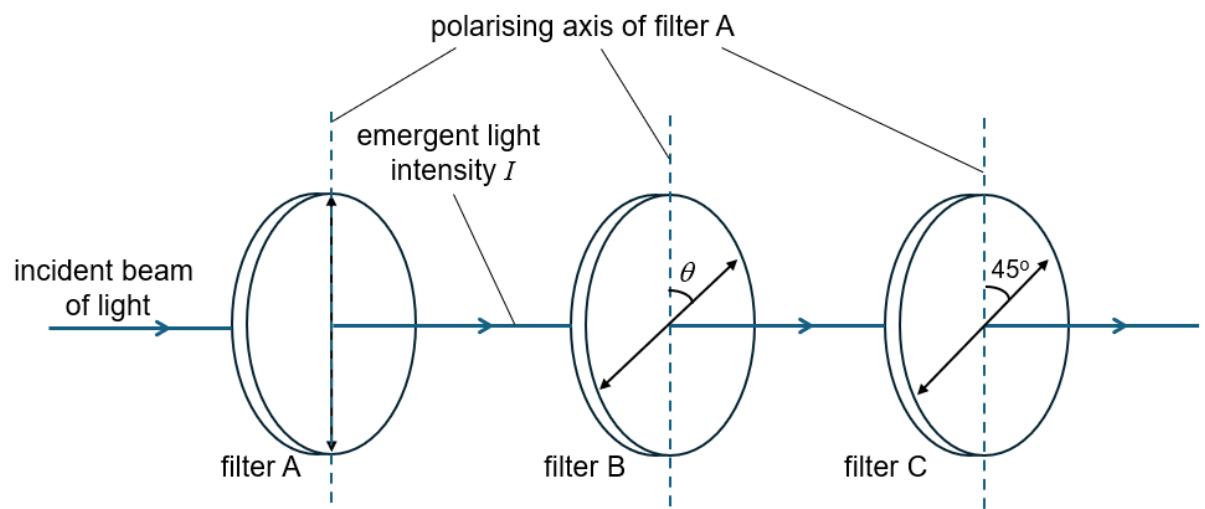


Fig. 3.1

The emergent beam after passing through filter A has an intensity of I .

Filter C is fixed in position such that its polarising axis is at an angle of 45° from the polarising axis of filter A.

Filter B is allowed to rotate. ϑ is the angle between the polarising axes of filter A and B.

- (i) Polarising filter B is rotated from $\vartheta = 0^\circ$ to $\vartheta = 180^\circ$.

Besides $\vartheta = 90^\circ$, there is another angle θ where the intensity of light emergent from filter C is zero. State the value of this angle.

$$\theta = \dots^\circ [1]$$

(ii) Filter B is adjusted such that $\vartheta = 60^\circ$.

Determine the intensity of light, in terms of I , that emerges from filter C.

intensity = I [2]

[Total: 5]

