5 **(a)** State why sound waves **cannot** be polarised.

.....

..... [1]

(b) A plane-polarised light wave is incident on a polarising filter as shown in Fig. 5.1.

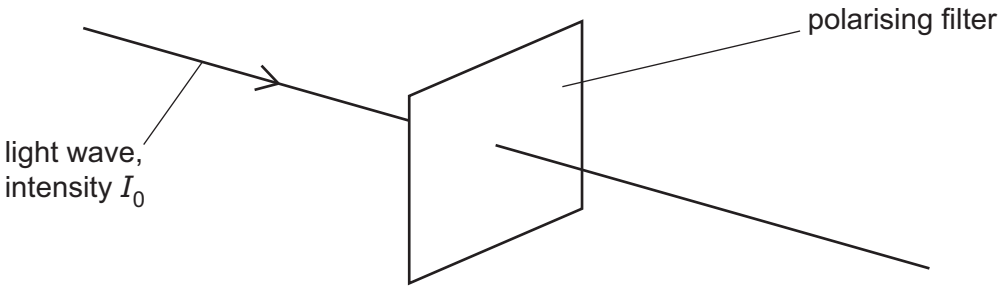

Fig. 5.1

The intensity of the light incident on the filter is I_0.

The light is incident normally on the filter and the transmission axis of the filter is initially perpendicular to the plane of polarisation of the light.

The filter is now rotated through 360° about the direction of travel of the light wave.

(i) On Fig. 5.2, sketch the variation of the intensity I of the transmitted light with the angle of rotation α as the filter is rotated through 360° from its initial position.

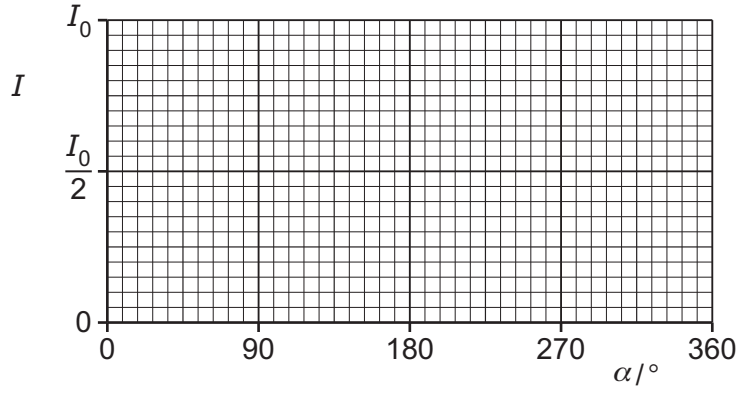

Fig. 5.2

[3]

(ii) The amplitude of the incident light wave is A_0 when the intensity of the wave is I_0.

Use Malus's law to determine, in terms of A_0, the amplitude of the transmitted wave when $\alpha = 20°$.

amplitude = ... A_0 [4]

[Total: 8]