

AS Level Physics A
H156/02 Depth in physics

Question Set 14

- 1 A student investigates the path of a light ray through ethanol. Fig. 8.1 shows ethanol in a rectangular glass container. Light of wavelength 5.2×10^{-7} m is incident on the container as shown.

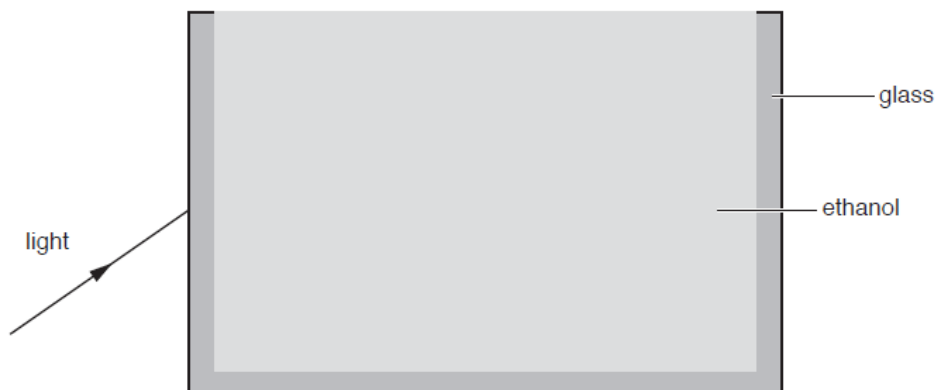


Fig. 8.1 (not to scale)

- (a) The table below shows the refractive indices n and speeds of light v in various transparent media.

medium	n	v/ms^{-1}
air	1.00	3.00×10^8
ethanol		2.20×10^8
glass	1.52	
vacuum	1.00	3.00×10^8

- (i) Complete the table by calculating the missing values of n and v .

[2]

- (ii) Determine the wavelength λ of the light in glass.

$\lambda = \dots\dots\dots\text{m}$

[1]

- (b) Fig. 8.2 shows an enlarged version of a section of the left hand side of the glass container.

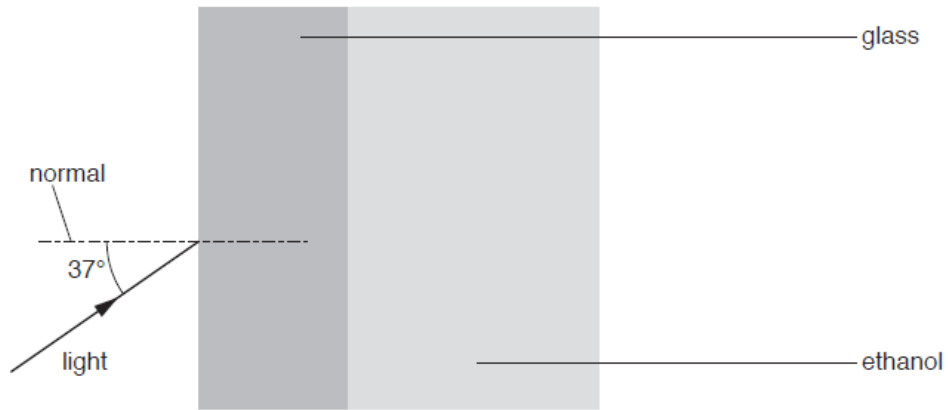


Fig. 8.2 (not to scale)

- (i) The light is incident on the glass at an angle of 37°. Determine the angle of refraction θ in the glass.

$\theta = \dots\dots\dots^\circ$

[2]

- (ii) Without any further calculation, sketch the ray of light as it passes through the glass into the ethanol.

[1]

Total Marks for Question Set 14: 6

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