2018 Ph H1 Q14

Section: Particles and Waves

Topic: Refraction of Light

Question Summary

A ray of monochromatic light of wavelength 6.30×10^{-7} m in air passes into glass (n = 1.50). What is the frequency of this light in the glass?

Worked Solution

Frequency does not change when light crosses a boundary.

Calculate frequency in air: $f = c / \lambda$.

$f = (3.00 \times 10^{8}) / (6.30 \times 10^{-7}) \approx 4.76 \times 10^{14}$ Hz.

Therefore the frequency in the glass is the same.

Final Answer

D — 4.76×10^{14} Hz

Revision Tips

• Frequency is constant across a boundary.

• Only speed and wavelength change with refractive index.

• Use $f = c / \lambda_{air}$ to calculate once.