Following Light Across a Liquid Boundary

Scoring guide · one credit per question · review written work against each rubric

Following Light Across a Liquid Boundary

Question 1

Choice (1)

The table shows that speed falls from 3.0×10^{8} to 2.0×10^{8} m/s and wavelength falls from 600 to 400 nm.

Question 2

In air the frequency is 3.0×10^{8} divided by 600×10^{-9}, or 5.0×10^{14} Hz. In the liquid it is 2.0×10^{8} divided by 400×10^{-9}, also 5.0×10^{14} Hz.

Question 3

The speed and wavelength both decrease by the same factor, leaving frequency at 5.0×10^{14} Hz. The unchanged frequency gives unchanged photon energy under the model.

Question 4

The frequency stays at 5.0×10^{14} Hz. At the restored air speed, the wavelength is 3.0×10^{8} divided by 5.0×10^{14}, which gives 6.0×10^{-7} m or 600 nm.