2022 Ph H1 Q17

Section: Particles and Waves

Topic: Refraction of Light

Question Summary

Red light passes from diamond into air. Which row in the table shows what happens to its speed, frequency, and wavelength?

Worked Solution

At a boundary, frequency does not change.

When moving from a higher n (diamond, n≈2.4) to lower n (air, n≈1), the speed increases.

Since f is constant and v = fλ, if v increases, λ also increases.

Therefore: speed increases, frequency no change, wavelength increases.

Final Answer

D — Increases, no change, increases

Revision Tips

• Frequency always stays constant across a boundary.

• If light goes into a medium with lower refractive index, speed and wavelength increase.

• If entering higher n, both decrease.