2023 Ph H1 Q18

Section: Particles and Waves

Topic: Refraction of Light

Question Summary

A ray of monochromatic light travels from crown glass (n≈1.52) into water (n≈1.33). The diagram shows three possible paths (P, Q, R). Which option is correct for speed, wavelength, and path?

Worked Solution

When moving from higher n (glass) to lower n (water), the speed increases.

Since frequency is unchanged, λ = v/f, so wavelength also increases.

Path: the ray bends away from the normal in the less dense medium → matches path R.

Therefore correct option: increases, increases, R.

Final Answer

D — Increases, increases, R

Revision Tips

• Light speeds up when entering a medium of lower refractive index.

• Frequency is constant at the boundary.

• Wavelength changes in proportion to speed (λ = v/f).

• Check diagram: ray bends away from the normal when leaving a denser medium.