

2024 Ph H1 Q15

Section: Particles and Waves

Topic: Interference

Question Summary

Students discuss coherence and make three statements: I: Coherent waves have a constant phase relationship, II: Coherent waves have the same frequency, III: Coherent waves have the same speed. Which statements are correct?

Worked Solution

Definition: Coherent sources = constant phase difference & same frequency.

So I (constant phase relationship) is correct.

II (same frequency) is also correct.

III (same speed) is not required — speed depends on medium, not coherence.

Therefore correct statements: I and II only.

Final Answer

C — I and II only

Revision Tips

- Coherence requires same frequency and constant phase difference.
- Same speed is not part of the definition — velocity depends on medium.
- Always check coherence definition carefully in multiple-choice questions.