2019 Ph H1 Q17

Section: Particles and Waves

Topic: Interference

Question Summary

Two coherent sources S1 and S2 produce interference. Wavelength is 28 mm. For the third minimum at P, find the path difference (S2P − S1P).

Worked Solution

Condition for minima: path difference = (m + 0.5)λ, where m = 0, 1, 2, …

For the 3rd minimum, m = 2 (since first minimum m=0, second m=1, third m=2).

So path difference = (2 + 0.5)λ = 2.5 × 28 mm.

2.5 × 28 = 70 mm.

Final Answer

C — 70 mm

Revision Tips

• For constructive interference: path difference = mλ.

• For destructive interference: path difference = (m + 0.5)λ.

• Be careful: 'third minimum' means m = 2.

• Multiply correctly to get path difference.