

Two small coherent sound sources S_1 and S_2 are set up as shown in Fig.5.1 below.

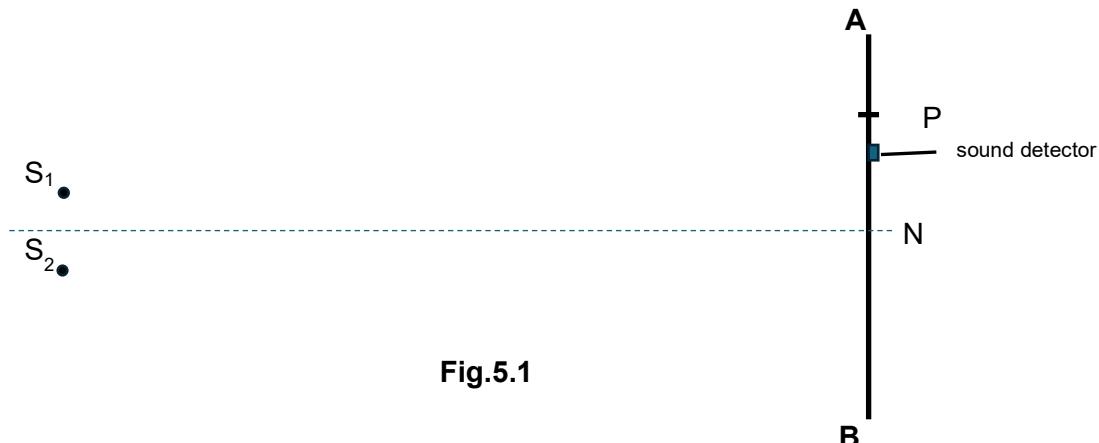


Fig.5.1

A sound detector is moved along a line AB that is parallel to S_1S_2 . N is the point on AB such that $S_1N = S_2N$. The sound waves from S_1 and S_2 have frequency 2.80 kHz and speed 336 m s^{-1} .

(a)

Show that the wavelength of the waves is 12.0 cm.

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[1]

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(b)

The detector, when placed at N, indicates a maximum intensity of sound. As it is moved from N to a point P, the intensity varies between high and low values. At P, the distance S_1P is 372 cm and S_2P is 402 cm.

Determine, with suitable explanation,

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(i)

whether the intensity of sound at P is high or low,

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[2]

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(ii)

the number of high intensity regions that are found between N and P. Do not include the maximum at N.

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[3]

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[Total: 6]

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