

Structured Questions

Longitudinal & Transverse Waves

Progressive Waves: Longitudinal & Transverse / Calculating Frequency / The Wave Equation / Graphical Representations of Transverse & Longitudinal Waves / Intensity of a Wave

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Total Marks

/10

1 (a) The normal frequency range of hearing for young people is from 20 Hz to 20 kHz.

i) The speed of sound in air is 340 m s^{-1} .

Calculate the **shortest** wavelength a young person can hear.

wavelength = m [2]

ii) Describe how you can use an oscilloscope, and other additional laboratory equipment, to determine the actual upper limit of the frequency range for a young person.

[3]

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(5 marks)

(b) State **one** difference and one similarity between the **oscillations** of a stationary sound wave and a progressive sound wave.

Difference:

Similarity:

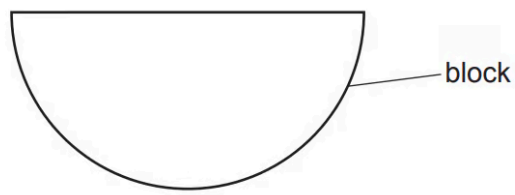
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(2 marks)

(c) You are provided with a ray-box, a semi-circular block of plastic and other normal laboratory equipment.

The outline of the block is shown below.



Describe how you could measure the refractive index n of the block using the critical angle method. Draw on the diagram and label it to make your answer clear.

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(3 marks)