A Level · OCR · Physics

5 mins 5 questions

Multiple Choice 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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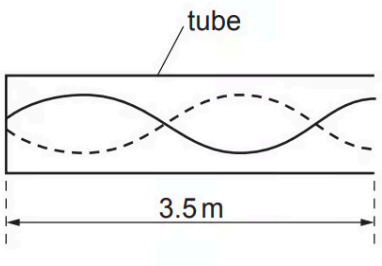
Total Marks /5

1 A stationary sound wave formed in a tube is shown below.



The tube is closed at one end. The length of the tube is 3.5 m.

The speed of sound is 340 m s^{-1}.

What is the frequency of the sound wave?

A. 97 Hz

B. 120 Hz

C. 240 Hz

D. 486 Hz

(1 mark)

2 A progressive wave of amplitude *a* has intensity *I*. This wave combines with another wave of amplitude 0.6*a* at a point in space. The phase difference between the waves is 180°.

What is the resultant intensity of the combined waves in terms of *I*?

A. 0.16 *I*

B. 0.4 *I*

C. 1.6 *I*

D. 2.6 *I*

(1 mark)

3 A small loudspeaker emits sound uniformly in all directions.

The amplitude of the sound is 12 μm at a distance of 1.5 m from the loudspeaker.

What is the amplitude of the sound at a distance of 4.5 m from the loudspeaker?

A. 1.3 μm

B. 4.0 μm

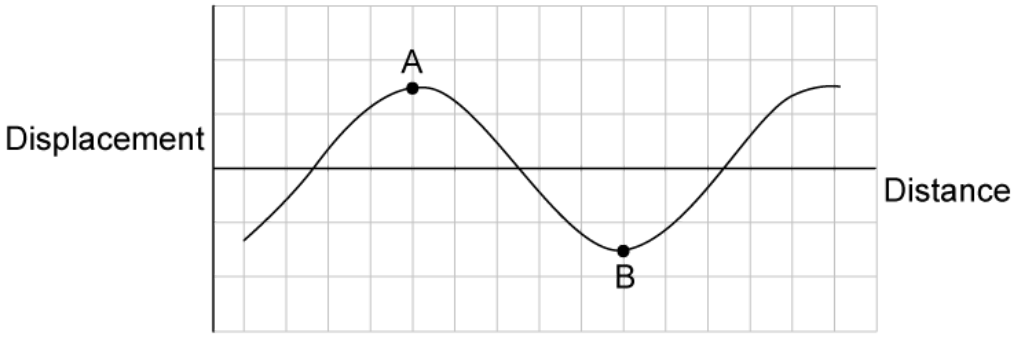
C. 6.9 μm

D. 12 μm

(1 mark)

4 The displacement against time graph for a progressive wave is shown below in Figure 1

Figure 1



Which statement is correct about the phase difference ? between points A and B?

A. $0° < \sigma < 90°$

B. $\sigma = 90°$

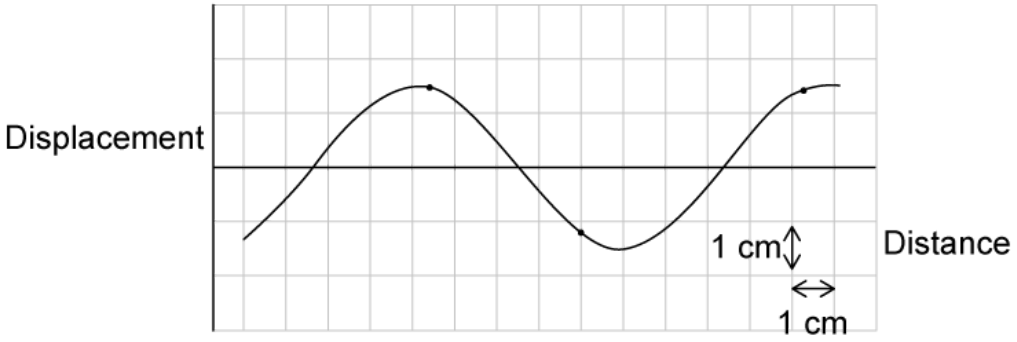
C. $\sigma = 180°$

D. $90° < \sigma < 180°$

(1 mark)

5 The graph in Figure 2 shows how a sound signal wave displacement varies with time *t*. The speed of the signal is 334 m s^{-1}.

Figure 2



What is the time period *T* (μs) of the sound signal?

A. 29.9 μs

B. 299 μs

C. 2990 μs

D. 29900 μs

(1 mark)