FREE REVISION PACK

Progressive Waves

Pearson Edexcel International Advanced Level Physics · Unit 2 (WPH12) · Specification points 33–34, 37

Easy | Medium | Hard | Multiple choice · past-paper questions

5	5	≈ 10 min
QUESTIONS	TOTAL MARKS	SUGGESTED TIME*

Contents

Q	LEVEL	FOCUS	SOURCE	MARKS
1	Easy	Frequency from an oscilloscope trace	Edexcel IAL January 2024 · Unit 2 · Q7	1 mark
2	Easy	What a displacement–time graph can tell you	Edexcel IAL October 2023 · Unit 2 · Q5	1 mark
3	Easy	Tension needed for the same wave speed	Edexcel IAL October 2023 · Unit 2 · Q8	1 mark
4	Medium	Wave speed on a longer string under more tension	Edexcel IAL June 2024 · Unit 2 · Q8	1 mark
5	Hard	Speed of waves on a string with hanging masses	Edexcel IAL October 2021 · Unit 2 · Q6	1 mark

Key ideas to have ready

- $v = f\lambda$, and $f = 1/T$.
- Displacement–time graph: gives period and amplitude. Displacement–distance graph: gives wavelength and amplitude.
- Speed of a transverse wave on a string: $v = \sqrt{(T/\mu)}$, μ = mass per unit length.
- Oscilloscope: period = number of divisions per cycle × time-base setting.

How to use this pack

1. The questions are grouped into levels (Easy, Medium and Hard). Work through them in order, and check your answers at the end of each level before moving on.
2. Every question is multiple choice with one correct answer. Write down your working anyway; that is how you find mistakes.
3. The separate mark scheme uses the same numbers and explains every answer.

Levels are based on how students did in Pearson's examiner reports where that information exists, plus our own difficulty rating. *About 1.5 minutes per question.

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Easy

Definitions and one-step ideas. Most students get these right.

Questions 1–3

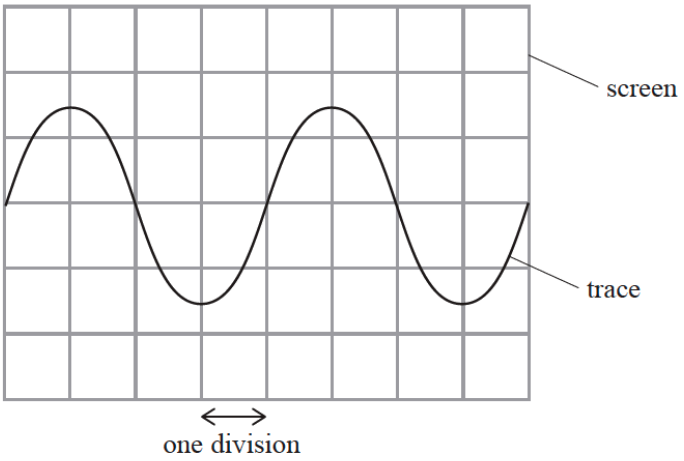
Choose **one** answer for each question and put a cross in the box next to it.

Edexcel IAL January 2024 · Unit 2 · Q7

1 A microphone is attached to an oscilloscope. The microphone detects a sound.

The trace displayed on the oscilloscope screen is shown.

Not to scale



One horizontal division represents a time of 0.015 s.

Which of the following expressions gives the frequency of the sound in Hz?

☒ **A** 4×0.015

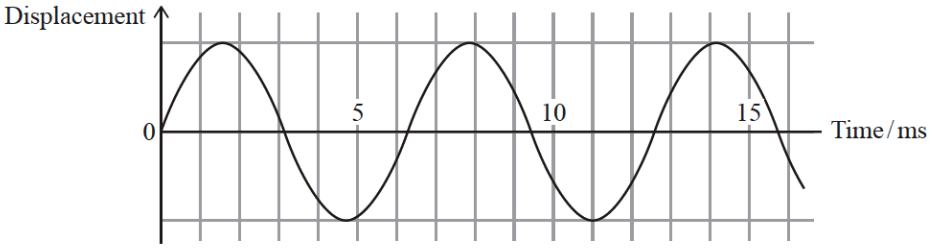
☒ **B** 2×0.015

☒ **C** $\frac{1}{2 \times 0.015}$

☒ **D** $\frac{1}{4 \times 0.015}$

Edexcel IAL October 2023 · Unit 2 · Q5

2 The graph shows how displacement varies with time for a particular point as a wave passes.



Which of the following statements is **not** correct?

- ☒ **A** The time period can be determined directly from the graph.
- ☒ **B** The wavelength can be determined directly from the graph.
- ☒ **C** The wave could be longitudinal.
- ☒ **D** The wave could be transverse.

Edexcel IAL October 2023 · Unit 2 · Q8

3 A string is placed under tension T. A wave travels along the string.

A second string has the same mass but twice the length. A wave travels along this string with the same velocity as the wave in the first string.

Which of the following is the tension in the second string?

- ☒ **A** $4T$
- ☒ **B** $2T$
- ☒ **C** $\frac{T}{2}$
- ☒ **D** $\frac{T}{4}$

Medium Two or three steps. Roughly a third to a half of students get these right. **Question 4**

Edexcel IAL June 2024 · Unit 2 · Q8

4 There is tension T in a string of length l. When the string is displaced and then released, waves move on the string with speed v.

A string of length $2l$ has the same diameter and is made from the same material. The tension in this string is $2T$.

Which of the following expressions gives the speed of waves on the string of length $2l$?

☒ **A** $\frac{v}{\sqrt{2}}$

☒ **B** $\frac{v}{2}$

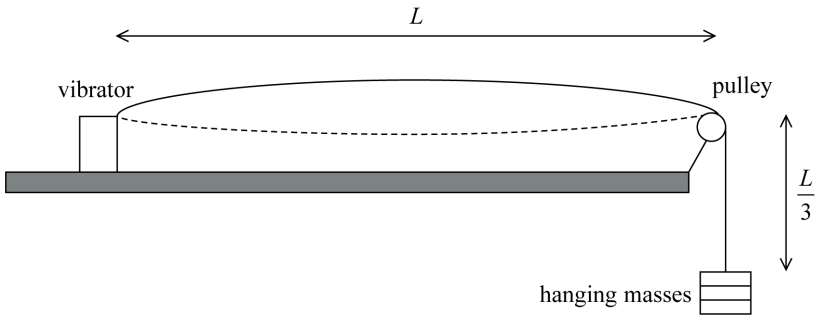
☒ **C** $\sqrt{2}v$

☒ **D** $2v$

Hard Several steps, often with a trap built in. Fewer than 3 in 10 students get these right. **Question 5**

Edexcel IAL October 2021 · Unit 2 · Q6

5 The speed of waves on a vibrating string is investigated using the apparatus shown.



length of string between vibrator and pulley = L

length of string between pulley and hanging masses = $\frac{L}{3}$

mass of whole string = m
mass of hanging masses = M

Which of the following expressions represents the speed of the waves on the string?

☐ **A** $\sqrt{\left(\frac{4MgL}{3m}\right)}$

☐ **B** $\sqrt{\left(\frac{2MgL}{3m}\right)}$

☐ **C** $\sqrt{\left(\frac{MgL}{m}\right)}$

☐ **D** $\sqrt{\left(\frac{MgL}{3m}\right)}$

End of questions. Check your answers with the matching mark scheme. More free packs and 1-to-1 tuition:
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