FREE REVISION PACK

Damping & Resonance

Pearson Edexcel International Advanced Level Physics · Unit 5 (WPH15) · Specification points 148, 151–153

Easy | Multiple choice · past-paper questions

5	5	≈ 10 min
QUESTIONS	TOTAL MARKS	SUGGESTED TIME*

Contents

Q	LEVEL	FOCUS	SOURCE	MARKS
1	Easy	What happens at resonance	Edexcel IAL June 2025 · Unit 5 · Q2	1 mark
2	Easy	Why ductile materials help in earthquakes	Edexcel IAL January 2025 · Unit 5 · Q2	1 mark
3	Easy	Amplitude when the energy of oscillation quadruples	Edexcel IAL January 2021 · Unit 5 · Q5	1 mark
4	Easy	Effect of adding mass to a damped paper cone	Edexcel IAL January 2025 · Unit 5 · Q8	1 mark
5	Easy	Why steel frames absorb earthquake energy	Edexcel IAL October 2024 · Unit 5 · Q2	1 mark

Key ideas to have ready

- Damping removes energy, so the amplitude decreases; energy $\propto$ amplitude^2.
- Forced oscillations happen at the driving frequency.
- Resonance: driving frequency = natural frequency, giving maximum amplitude and energy transfer.
- Plastic (ductile) deformation absorbs energy, so it damps oscillations.

How to use this pack

1. The questions are grouped into levels (Easy). 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 1–5

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

Edexcel IAL June 2025 · Unit 5 · Q2

1 A mass is driven into oscillation, and resonance takes place.

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

- ☒ **A** The amplitude of oscillation of the mass is a maximum.
- ☒ **B** The frequency of oscillation of the mass is a maximum.
- ☒ **C** The mass is driven at its natural frequency.
- ☒ **D** The transfer of energy to the mass is a maximum.

Edexcel IAL January 2025 · Unit 5 · Q2

2 Ductile materials can be used in buildings to reduce the amplitude of forced oscillations during an earthquake.

Which of the following is the reason that ductile materials are used?

- ☒ **A** These materials are stiff.
- ☒ **B** These materials are strong.
- ☒ **C** These materials deform elastically.
- ☒ **D** These materials deform plastically.

Edexcel IAL January 2021 · Unit 5 · Q5

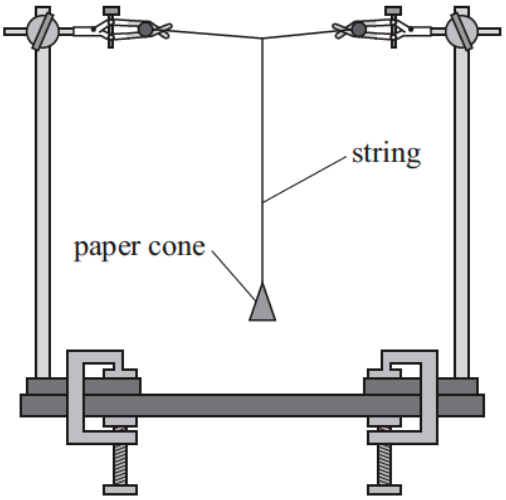
3 A car is driven along an uneven road. This forces the car into vertical oscillations. Over time, the energy of oscillation of the car increases by a factor of 4.

The amplitude of oscillation increases by a factor of

- ☒ **A** $\frac{1}{4}$
- ☒ **B** $\frac{1}{2}$
- ☒ **C** 2
- ☒ **D** 4

Edexcel IAL January 2025 · Unit 5 · Q8

4 A pendulum is made by attaching a light paper cone to a thin string, as shown.



The pendulum is displaced and set into oscillation.

Plasticine is then added to the paper cone to increase the mass of the pendulum.

The pendulum is set into oscillation again.

Which of the following is correct for the paper cone with plasticine?

☒ **A** The frequency of oscillation has decreased.

☒ **B** The period of oscillation has increased.

☒ **C** The amplitude of oscillation decreased more quickly.

☒ **D** The amplitude of oscillation decreased more slowly.

Edexcel IAL October 2024 · Unit 5 · Q2

5 During an earthquake, steel-framed buildings remove energy from the oscillation of the building.

Which of the following is the reason for this?

☒ **A** Steel is a ductile material.

☒ **B** Steel is an elastic material.

☒ **C** Steel is a stiff material.

☒ **D** Steel is a strong material.

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