FREE REVISION PACK

Stress, Strain & Young Modulus

Pearson Edexcel International Advanced Level Physics · Unit 1 (WPH11) · Specification points 28–31

Easy | Multiple choice · past-paper questions

5	5	≈ 10 min
QUESTIONS	TOTAL MARKS	SUGGESTED TIME*

Contents

Q	LEVEL	FOCUS	SOURCE	MARKS
1	Easy	Reading elastic limit and plastic region from a stress–strain graph	Edexcel IAL June 2019 · Unit 1 · Q6	1 mark
2	Easy	Young modulus from a stress–strain graph	Edexcel IAL January 2025 · Unit 1 · Q1	1 mark
3	Easy	Comparing two stress–strain graphs	Edexcel IAL January 2024 · Unit 1 · Q9	1 mark
4	Easy	Extension of two different wires	Edexcel IAL October 2025 · Unit 1 · Q8	1 mark
5	Easy	Getting a larger extension before breaking	Edexcel IAL June 2024 · Unit 1 · Q9	1 mark

Key ideas to have ready

- Stress = F/A (Pa); strain = Δx/x (no unit); Young modulus E = stress ÷ strain.
- E is the gradient of the linear part of a stress–strain graph; it is a property of the material.
- Area A = $\pi d^2/4$: doubling the diameter quadruples the area.
- Extension Δx = FL/(AE): longer, thinner wires stretch more.

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.

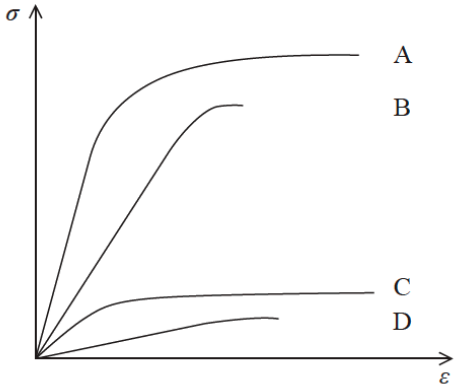
Questions 1–5

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

Edexcel IAL June 2019 · Unit 1 · Q6

1 A graph of stress σ against strain ε, up to the breaking point, is drawn for four samples of wire, A, B, C and D.

Which sample of wire has both a low elastic limit **and** a large region of plastic deformation?



☒ **A**

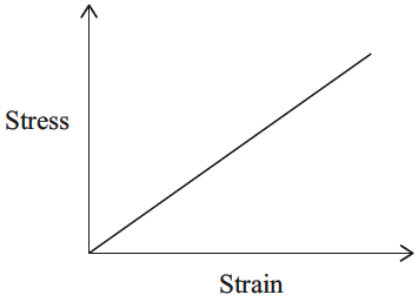
☒ **B**

☒ **C**

☒ **D**

Edexcel IAL January 2025 · Unit 1 · Q1

2 Stress is applied to a sample of a material. The stress is increased until the sample breaks. The graph shows the relationship between stress and strain for the sample.



Which of the following gives the Young modulus of the material?

☒ **A** The area between the line and the strain axis.

☒ **B** The gradient of the graph.

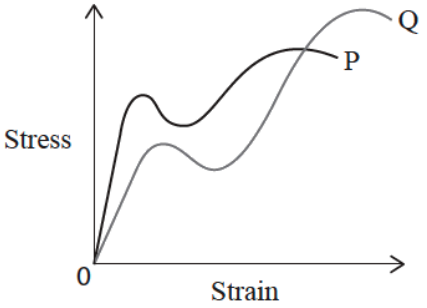
☒ **C** The maximum stress multiplied by the maximum strain.

☒ **D** The maximum strain divided by the maximum stress.

Edexcel IAL January 2024 · Unit 1 · Q9

3 A force is applied to stretch two wires, P and Q, until the wires break. Each wire is made of a different metal.

The stress-strain graph for each wire is shown.



Which of the following statements is correct?

☒ **A** P has a greater breaking stress than Q.

☒ **B** P has a greater breaking strain than Q.

☒ **C** P has a greater yield stress than Q.

☒ **D** P has a lower Young modulus than Q.

Edexcel IAL October 2025 · Unit 1 · Q8

4 The table shows information about two wires made from different metals.

Wire	Length	Cross-sectional area	Young modulus of metal
P	L	A	E
Q	L	$\frac{A}{2}$	$2E$

A tensile force applied to P produces an extension Δx.
The same tensile force is applied to Q.

Which of the following is the extension of Q?

☒ **A** $\frac{\Delta x}{4}$

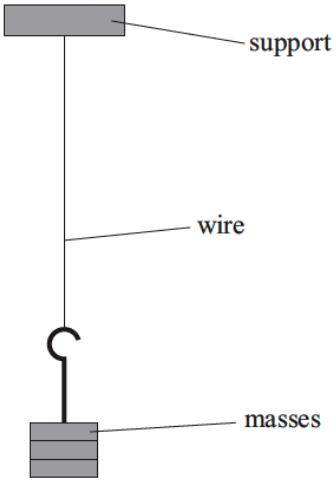
☒ **B** $\frac{\Delta x}{2}$

☒ **C** Δx

☒ **D** $4\Delta x$

Edexcel IAL June 2024 · Unit 1 · Q9

5 A student attached one end of a wire to a support. The student added masses to the other end of the wire, as shown. The student measured the corresponding extension for each added mass.



The wire broke when the extension was small.

The student replaced the wire with a second wire made of the same material.
The second wire had a larger extension before breaking.

Which of the following produced this result?

☒ **A** The second wire had a greater diameter.

☒ **B** The second wire had a longer length.

☒ **C** The second wire had a smaller diameter.

☒ **D** The second wire had a shorter length.

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