FREE REVISION PACK

Gas Laws

Pearson Edexcel International Advanced Level Physics · Unit 5 (WPH15) · Specification points 130–131

Easy | Multiple choice · past-paper questions

4	4	≈ 5 min
QUESTIONS	TOTAL MARKS	SUGGESTED TIME*

Contents

Q	LEVEL	FOCUS	SOURCE	MARKS
1	Easy	Conditions for Boyle's law	Edexcel IAL June 2022 · Unit 5 · Q8	1 mark
2	Easy	Conditions for the pressure law	Edexcel IAL October 2022 · Unit 5 · Q2	1 mark
3	Easy	Ideal gas: volume and temperature when the pressure quadruples	Edexcel IAL January 2022 · Unit 5 · Q5	1 mark
4	Easy	Mean square speed when the pressure quadruples	Edexcel IAL June 2021 · Unit 5 · Q7	1 mark

Key ideas to have ready

- For a fixed mass of ideal gas: pV/T = constant (pV = NkT), with T in kelvin.
- Boyle's law: pV constant at constant T. Pressure law: p ∝ T at constant V.
- The gas laws need a fixed amount of gas, but not identical molecules.
- Test each option by substituting into pV/T.

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 1–4

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

Edexcel IAL June 2022 · Unit 5 · Q8

1 Boyle's law states that, under certain conditions, the pressure exerted by a gas is inversely proportional to the volume occupied by the gas.

Which of the following conditions is **not** necessary?

- ☒ **A** The gas must be ideal.
- ☒ **B** The mean kinetic energy of the molecules must stay constant.
- ☒ **C** The molecules in the gas must be identical.
- ☒ **D** The number of molecules in the gas must stay constant.

Edexcel IAL October 2022 · Unit 5 · Q2

2 The pressure law states that, if certain conditions are met, the pressure exerted by an ideal gas is proportional to the temperature of the gas.

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

- ☒ **A** The absolute temperature must be used.
- ☒ **B** The molecules in the gas must be identical.
- ☒ **C** The number of molecules in the gas must stay constant.
- ☒ **D** The volume of the gas must stay constant.

Edexcel IAL January 2022 · Unit 5 · Q5

3 A fixed mass of an ideal gas has a volume V and exerts a pressure p. The absolute temperature of the gas is T. When the gas is heated, the new pressure is $4p$.

Which row of the table gives correct values of the new volume and the new temperature?

	Volume	Temperature
☒ **A**	$\frac{V}{2}$	$2T$
☒ **B**	$\frac{V}{2}$	$4T$
☒ **C**	$2V$	$2T$
☒ **D**	$2V$	$4T$

Edexcel IAL June 2021 · Unit 5 · Q7

4 Helium gas in a closed cylinder is heated until the pressure exerted by the helium is four times the original pressure. The volume occupied by the helium stays constant.

The mean square speed of the helium molecules before heating is $\langle v_I^2 \rangle$. The mean square speed of the helium molecules after heating is $\langle v_F^2 \rangle$.

What is the ratio $\frac{\langle v_F^2 \rangle}{\langle v_I^2 \rangle}$?

☒ **A** 1

☒ **B** 2

☒ **C** 4

☒ **D** 8

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