FREE REVISION PACK

Cosmology

Pearson Edexcel International Advanced Level Physics · Unit 5 (WPH15) · Specification points 171

Easy | Multiple choice · past-paper questions

5	5	≈ 10 min
QUESTIONS	TOTAL MARKS	SUGGESTED TIME*

Contents

Q	LEVEL	FOCUS	SOURCE	MARKS
1	Easy	Density and the fate of the universe	Edexcel IAL October 2024 · Unit 5 · Q7	1 mark
2	Easy	Condition for an open universe	Edexcel IAL June 2023 · Unit 5 · Q1	1 mark
3	Easy	New age of the universe from a new Hubble constant	Edexcel IAL January 2025 · Unit 5 · Q7	1 mark
4	Easy	What dark matter is	Edexcel IAL January 2021 · Unit 5 · Q2	1 mark
5	Easy	Hubble constant from the age of the universe	Edexcel IAL October 2025 · Unit 5 · Q4	1 mark

Key ideas to have ready

- Age of the universe ≈ $1/H_0$: a smaller H_0 means an older universe.
- Average density > critical density → universe eventually contracts (closed).
- Average density < critical density → expands forever (open).
- Dark matter has mass and gravity but emits no electromagnetic radiation.

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 October 2024 · Unit 5 · Q7

1 The universe is currently expanding, but the ultimate fate of the universe is unknown.

Different conditions would result in a different ultimate fate for the universe.

Which row of the table correctly links a condition with the ultimate fate of the universe?

	Condition	Ultimate fate of universe
☒ **A**	Density of universe is equal to the critical density	Universe eventually contracts
☒ **B**	Density of universe is greater than the critical density	Universe eventually contracts
☒ **C**	Mass of universe is equal to the critical mass	Universe expands forever
☒ **D**	Mass of universe is greater than the critical mass	Universe expands forever

Edexcel IAL June 2023 · Unit 5 · Q1

2 The ultimate fate of the universe is uncertain.

Which of the following would result in an open universe?

☒ **A** The average density of the universe is equal to the critical density of the universe.

☒ **B** The average density of the universe is less than the critical density of the universe.

☒ **C** The mass of the universe is equal to the critical mass of the universe.

☒ **D** The mass of the universe is greater than the critical mass of the universe.

Edexcel IAL January 2025 · Unit 5 · Q7

3 The value of the Hubble constant, H_0, was initially estimated to be $1.5 \times 10^{-17}\,s^{-1}$. Using this initial value, the age of the universe is T.

Scientists now estimate H_0 to be $2.1 \times 10^{-18}\,s^{-1}$.

Which of the following is the age of the universe using this value of H_0?

☒ **A** $0.14\,T$

☒ **B** $0.71\,T$

☒ **C** $1.4\,T$

☒ **D** $7.1\,T$

Edexcel IAL January 2021 · Unit 5 · Q2

4 Scientists believe that some of the mass of our universe consists of "dark matter".

Which of the following is true of dark matter?

- ☒ **A** It absorbs all electromagnetic radiation.
- ☒ **B** It emits no electromagnetic radiation.
- ☒ **C** It exerts no gravitational force.
- ☒ **D** It is a form of anti-matter.

Edexcel IAL October 2025 · Unit 5 · Q4

5 The Hubble constant is related to the age of the universe.

A recent estimate of the age of the universe is 1.37×10^{10} years.

Which of the following expressions gives a value for the Hubble constant in s^{-1}?

1 year = 3.15×10^{7} s

- ☒ **A** $\dfrac{3.15 \times 10^{7}}{1.37 \times 10^{10}}$
- ☒ **B** $\dfrac{1.37 \times 10^{10}}{3.15 \times 10^{7}}$
- ☒ **C** $\dfrac{1}{1.37 \times 10^{10} \times 3.15 \times 10^{7}}$
- ☒ **D** $1.37 \times 10^{10} \times 3.15 \times 10^{7}$

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