FREE REVISION PACK

Quarks

Pearson Edexcel International Advanced Level Physics · Unit 4 (WPH14) · Specification points 121

Easy | Multiple choice · past-paper questions

4	4	≈ 5 min
QUESTIONS	TOTAL MARKS	SUGGESTED TIME*

Contents

Q	LEVEL	FOCUS	SOURCE	MARKS
1	Easy	Quark structure of protons and neutrons	Edexcel IAL January 2023 · Unit 4 · Q1	1 mark
2	Easy	Baryon with a charge of +2e	Edexcel IAL October 2022 · Unit 4 · Q7	1 mark
3	Easy	Quark structure of a π^-	Edexcel IAL October 2021 · Unit 4 · Q9	1 mark
4	Easy	Splitting a pentaquark into a baryon and a meson	Edexcel IAL June 2021 · Unit 4 · Q4	1 mark

Key ideas to have ready

- Up quark $+\frac{2}{3}e$; down quark $-\frac{1}{3}e$; antiquarks have opposite charges.
- Proton = uud; neutron = udd.
- Baryons have 3 quarks; mesons a quark and an antiquark.
- Add the quark charges to check a particle's charge.

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.

Questions are reproduced from Pearson Edexcel International Advanced Level past papers; Pearson Edexcel material is © Pearson Education Ltd. Question numbers have been changed to suit this pack. Get Better At Physics is an independent tutor and is not affiliated with or endorsed by Pearson. Free for personal revision and classroom use.

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 January 2023 · Unit 4 · Q1

1 The table shows the charges on up quarks and down quarks.

Quark	Charge / e
u	$+\frac{2}{3}$
d	$-\frac{1}{3}$

Which row of the table shows the quark structure of protons and neutrons?

		Proton	Neutron
☒	**A**	ddd	uuu
☒	**B**	ddu	uud
☒	**C**	duu	ddu
☒	**D**	uuu	ddd

Edexcel IAL October 2022 · Unit 4 · Q7

2 The table shows the relative charges on up and down quarks.

u	$\frac{2}{3}e$
d	$-\frac{1}{3}e$

Which of the following could be the quark composition for a baryon with a charge of $+2e$?

☒ **A** ddd

☒ **B** $u\bar{d}$

☒ **C** $u\bar{u}$

☒ **D** uuu

Edexcel IAL October 2021 · Unit 4 · Q9

3 Which of the following is the quark structure for a π^- particle?

☒ **A** d d d

☒ **B** $\bar{u}\,\bar{u}\,\bar{d}$

☒ **C** $\bar{u}$ d

☒ **D** u d

Edexcel IAL June 2021 · Unit 4 · Q4

4 In 2015, a pentaquark was discovered.

The pentaquark was made of 5 quarks, c, $\bar{c}$, d, u, u.

The pentaquark can form a baryon-meson combination.

Which row of the table shows a possible arrangement of the quarks?

		Quarks in baryon	Quarks in meson
☒	**A**	d u u	c $\bar{c}$
☒	**B**	u $\bar{c}$ u	d c
☒	**C**	$\bar{c}$ u	d u c
☒	**D**	u d	c $\bar{c}$ u

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