GET BETTER AT PHYSICS · MARK SCHEME

Quarks: tiered multiple choice

Edexcel IAL Physics · Unit 4 (WPH14) · Specification points 121 · 4 questions · 4 marks

1 mark per correct letter | Worked reasoning for every question

How students did = from Pearson examiner reports, where available

Answer key

Q1	Q2	Q3	Q4
C	D	C	A

Easy

Questions 1–4

1 **C**

Quark structure of protons and neutrons · Edexcel IAL January 2023 · Unit 4 · Q1

Proton: charge +1, so uud (⅔ + ⅔ − ⅓ = +1), written duu. Neutron: charge 0, so udd (⅔ − ⅓ − ⅓ = 0), written ddu.

How students did: 91% of students got this right in January 2023.

2 **D**

Baryon with a charge of +2e · Edexcel IAL October 2022 · Unit 4 · Q7

A baryon has three quarks (B and C have two, so they are mesons). ddd has charge −1e; uuu has charge 3 × (+⅔e) = +2e.

How students did: 86% of students got this right in October 2022.

3 **C**

Quark structure of a π^- · Edexcel IAL October 2021 · Unit 4 · Q9

A pion is a meson: one quark and one antiquark. A π^- has charge −1: $\bar{u}$ (−⅔) + d (−⅓) = −1.

How students did: 73% of students got this right in October 2021.

4 **A**

Splitting a pentaquark into a baryon and a meson · Edexcel IAL June 2021 · Unit 4 · Q4

A baryon has three quarks and a meson has a quark–antiquark pair. The five quarks c, $\bar{c}$, d, u, u can only split this way as a baryon d u u plus a meson c $\bar{c}$.

End of mark scheme. Answers from Pearson's published mark schemes; explanations written for this pack. Pearson Edexcel material is © Pearson Education Ltd. More free packs and 1-to-1 tuition: **www.getbetteratphysics.co.uk**

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