GET BETTER AT PHYSICS · MARK SCHEME

Classification of Particles: tiered multiple choice

AQA A-level Physics · 7407 / 7408 · Specification 3.2.1.5 · 5 questions · 5 marks

1 mark per correct letter | Worked reasoning for every question | **How students did** = from AQA examiner reports, where available

Answer key

Q1	Q2	Q3	Q4	Q5
B	D	A	A	A

Easy

Questions 1–4

1 **B**

Baryons and leptons in a carbon atom · AQA June 2019 · AS Paper 2 · Q9

Carbon-12 has 12 nucleons (6 protons + 6 neutrons), and protons and neutrons are baryons: 12 baryons. The neutral atom has 6 electrons, which are leptons: 6 leptons.

How students did: Almost 90% of students got this right in June 2019.

2 **D**

Properties of the muon · AQA June 2019 · AS Paper 2 · Q10

A muon is a lepton, so it is not affected by the strong interaction. It is unstable and decays by the weak interaction into an electron, a muon neutrino and an electron antineutrino.

Watch out: B is wrong because the decay must also produce neutrinos to conserve lepton numbers.

How students did: Around 70% of students got this right in June 2019.

3 **A**

How strange particles are made and decay · AQA June 2017 · AS Paper 2 · Q13

Strange particles are produced in pairs by the strong interaction, which conserves strangeness. They decay into non-strange particles by the weak interaction, the only interaction that can change strangeness.

How students did: Just over 50% of students got this right in June 2017.

4 **A**

Which interactions do hadrons and leptons feel? · AQA June 2017 · AS Paper 2 · Q6

Hadrons feel both the strong and the weak interaction. Leptons never feel the strong interaction (they feel the weak interaction), so only A is correct.

How students did: Over 60% of students got this right in June 2017.

Medium

Question 5

5 **A**

The particle family tree · AQA 2021 · AS Paper 2 · Q35

Particles divide into hadrons (which feel the strong interaction) and leptons (which don't). Hadrons then divide into baryons (three quarks) and mesons (quark–antiquark): diagram A.

Watch out: Baryons and mesons are both kinds of hadron, so they must sit below Hadrons, not beside Leptons.

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

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