



QUESTION WORKBOOK

Classification of particles

Particles · Year 12

AQA 3.2.1.5 · CIE 11.2 · OCR A 6.4.2

10 questions · 30 marks

NAVY SCREEN EDITION

SECTION A · Warm-up

A1 Classify particles into the two broad groups based on whether they feel the strong interaction, and name each group. [2]

A2 Distinguish between a baryon and a meson. [2]

A3 Give two examples of leptons. [2]

SECTION B · Standard

B1 State the baryon number of a baryon, an antibaryon and a meson, and explain how baryon number is used. [3]

B2 State the lepton number of an electron, a positron and an electron antineutrino.

[3]

B3 A free neutron decays: $n \rightarrow p + e^- + \text{anti-}\nu_e$. Show that this decay conserves both baryon number and lepton number.

[4]

B4 Describe how strange particles are produced and how they decay, and state what this implies about strangeness.

[3]

SECTION C · Stretch

- C1** A proposed interaction is $p + e^- \rightarrow n + \nu_e$. By checking charge, baryon number and lepton number, state whether it is allowed. [4]

- C2** Classify each of these particles as a baryon, a meson or a lepton: proton, pion, muon, neutron, electron neutrino. [4]

- C3** State two properties that distinguish a lepton from a hadron. [3]