InkPhysics

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

PRINT EDITION

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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]