



QUESTION WORKBOOK

Particle interactions and exchange particles

Particles · Year 12

AQA 3.2.1.4 · OCR A 6.4.2

10 questions · 30 marks

NAVY SCREEN EDITION

SECTION A · Warm-up

A1 Name the four fundamental interactions (forces). [2]

A2 Name the exchange particle responsible for the electromagnetic interaction. [2]

A3 State the exchange particles responsible for the weak interaction. [2]

SECTION B · Standard

B1 State the exchange particle associated with each of the four fundamental interactions. [3]

B2 Explain what is meant by an exchange particle, and how it accounts for a force between two particles. [3]

- B3** Describe the beta-minus decay of a neutron in terms of an exchange particle, naming the exchange particle and all the products. [4]

- B4** Describe the beta-plus decay of a proton in terms of an exchange particle and its products. [3]

SECTION C · Stretch

- C1** Electron capture can be represented by a proton and an electron interacting to give a neutron and a neutrino. State the exchange particle involved and write the overall interaction. [4]

C2 Explain why the weak interaction has a very short range compared with the electromagnetic interaction. [4]

C3 State one similarity and one difference between the electromagnetic and weak interactions in terms of their exchange particles. [3]
