



A Level Physics A

H556/02 Exploring physics

Question Set 10

1 (a) Describe the nature of the *strong nuclear force*. [2]

It acts between hadrons in a short range - Repulsive below 0.5 fm & attractive up to 3 fm.

(b) (i) Name a hadron found in the nucleus of an atom and state its quark combination.

name of hadron:proton..... quark combination:u u d..... [1]

(ii) Write a decay equation in terms of a quark model for beta-minus decay.



(c) The radius of a nucleus is directly proportional to $A^{1/3}$, where A is the nucleon number.

The mass of a proton and a neutron are similar.

Explain why the mean density of all nuclei is about the same. [2]

$$\text{Density} = \frac{\text{mass}}{\text{volume}} \Rightarrow \text{mass} \propto A \quad \text{volume} \propto r^3 \propto (A^{1/3})^3 \propto A \Rightarrow \text{Density} \propto \frac{A}{A} \propto \text{constant} \quad [2]$$

Total Marks for Question Set 10: 7

OCR

Oxford Cambridge and RSA

Copyright Information

OCR is committed to seeking permission to reproduce all third-party content that it uses in its assessment materials. OCR has attempted to identify and contact all copyright holders whose work is used in this paper. To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced in the OCR Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download from our public website (www.ocr.org.uk) after the live examination series.

If OCR has unwittingly failed to correctly acknowledge or clear any third-party content in this assessment material, OCR will be happy to correct its mistake at the earliest possible opportunity.

For queries or further information please contact The OCR Copyright Team, The Triangle Building, Shaftesbury Road, Cambridge CB2 8EA.

OCR is part of the Cambridge Assessment Group; Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge