Practice Question Set For GCSE
Subject : Physics
Paper-1 Topic: Atomic Structure (High Demand)

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Name of the Student:_____
Max. Marks : 20 Marks **Time : 20 Minutes**

Mark Schemes

Q1.

(a) beta

1

alpha: would not pass through (the aluminium / foil)

1

gamma: no change in count rate when thickness changes

must be a connection between detection / count rate / passing through and change in thickness

1

(b) foil thickness increases then decreases (then back to normal / correct thickness)

a description of count rate changes is insufficient

1

gap between rollers decreases, then increases (then back to correct size)
or
pressure from rollers increases then decreases

accept tightness for pressure

answers may link change in thickness and gap width for full credit ie:

foil thickness increases so gap between rollers decreases (1)

foil thickness decreases so gap between rollers increases (1)

1

(c) 56 (years)

accept any value between 55-57 inclusive

*allow **1** mark for correct calculation of mass remaining as 1.5 (micrograms)*

*allow **1** mark for a mass of 4.5 micrograms plus correct use of graph with an answer of 12*

*maximum of **1** compensation mark can be awarded*

2

[7]

Q2.

(a) (i) number of protons are the same

accept atomic number / number of electrons for number of protons

1

number of neutrons are different

accept mass numbers are different – only if the first mark is awarded

1

(ii) an electron from the nucleus

both parts needed

1

(b) decays at the same rate as it is made

accept decays as fast as it is made

accept absorbed / used by plants (in CO_2) at same rate as it is being made

1

(c) (i) 3500

no tolerance

1

(ii) adjusted age correctly obtained from the graph

accept values between 3700–3800 inclusive

accept their (c)(i) used correctly to obtain an adjusted age from the graph

1

adjusted age +50

second mark can only be scored if first mark awarded

if no working shown an answer between 3750–3850 inclusive scores both marks

note: any line or mark made on the graph counts as working out

1

[7]

Q3.

(a) (i) alpha (particle)

1

(ii) (unstable) nucleus

accept (unstable) nuclei

*do **not** accept middle*

*do **not** accept helium nucleus*

1

(iii) same number of protons

accept same number of electrons

accept same atomic / proton number

accept they both have 92 protons

same number of neutrons negates answer

1

(b) (i) 4500 million years

*do **not** accept 4500 years*

1

(ii) curve starting at 100 000 with a correct general shape

1

passing through (4500, 50 000) and (9000, 25 000)

*allow **1** mark for points plotted*

or

line passing through (4500, 50 000) and (9000, 25 000)

1

[6]