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

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Name of the Student:_____
Max. Marks : 22 Marks **Time : 22 Minutes**

Mark Schemes

Q1.

(a) (i) *gamma hardly ionises the air*

accept does not ionise
accept gamma radiation is not charged

*do **not** accept answers in terms of danger of gamma or other properties*

1

(ii) *half-life (too) short*

accept need frequent replacement 'it' refers to curium-242

1

(iii) *(two) fewer neutrons*

accept different numbers of neutrons if a number is specified it must be correct

*do **not** accept more neutrons unless curium-244 is specified*

1

(b) (i) *gamma*

accept correct symbol

1

(ii) *both absorbed by the metal / steel / weld*

only scores if (b)(i) is correct
accept cannot pass through the metal / steel / weld

1

(c) (i) *put source into water at **one** point on bank*

accept the idea of testing different parts of the river bank at different times

1

see if radiation is detected in polluted area

accept idea of tracing

1

(ii) *2.7 (days)*

*allow **1** mark for showing correct use of the graph*

2

[9]

Q2.

(i) *nucleus / neutron*

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*do **not** accept shells or orbits*

1

*(ii) neutron changes to a proton **or** number of neutrons goes down 1 and the number of protons goes up by 1*

*do **not** accept becomes positive*

1

[2]

Q3.

(i) $\frac{1}{4}$

accept 0.25 or 25%

1

(ii) 2600

if answer to (c)(i) is ½ then accept 1300

1

[2]

Q4.

(a) (i) element with equal number of protons, different number neutrons
or
same atomic/proton number different mass/nuclear number

1

*(ii) time taken for activity **or** count rate **or** number of nuclei to decrease to half*

*accept parents atoms **or** radioactive isotope*

do not accept time taken for radioactivity/substance/ material to halve

1

(iii) 12 (s)

1

(b) (i) 22800 (years)

*allow 1 mark for iterative steps 80-40-20-10-5 **or** statement of 4 half-lives*

2

(ii) decay (of carbon 14) over 150 years is insignificant

accept very little decay

accept change is too small

1

(c) either argument gains full credit

accept any 3 valid points from for and/or against arguments

FOR

– massive dilution of waste
– reduces concentration (within a given volume) to insignificant levels
– distant from habitation

AGAINST

– pollution (of the sea/beach)

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*– mutation **or** harm caused to living things (animals/plants)*
– effect on food chain
– long period of time necessary

3

[9]

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