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

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Name of the Student:_____
Max. Marks : 18 Marks **Time : 18 Minutes**

Mark Schemes

Q1.

(a) cell damage or cancer

accept kills / mutates cells
radiation poisoning is insufficient
ionising is insufficient

1

(b) (i) any **one** from:

- use tongs to pick up source
- wear gloves
- use (lead) shielding
- minimise time (of exposure)
- maximise distance (between source and teacher).

accept any other sensible and practical suggestion
ignore reference to increasing / decreasing the number / thickness of lead sheets

1

(ii) background

1

(c) (i) curve drawn *from point 2,160*

*do **not** accept straight lines drawn from dot to dot*

1

(ii) (also) increases

less radiation passes through is insufficient

1

(iii) 50

accept any value from 40 to 56 inclusive

1

(d) gamma

1

only gamma (radiation) can pass through lead

*accept alpha **and** beta cannot pass through lead*
a general property of gamma radiation is insufficient

1

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Q2.

(a) (an equal amount of) positive charge

*do **not** accept charge on the atom / nucleus is positive*

1

(b) (i) a (significant) number of alpha particles were scattered by more than 4°
or
alpha particles deflected backwards

accept (some) measurements / results were unexpected

1

measurements / results could not be explained by 'plum pudding' model
or
measurements / results did not support predictions

can be explained by the nuclear model is insufficient

accept measurements / results did not support hypothesis

1

(ii) many / (over)100 000 measurements / results taken

accept Rutherford(and Marsden) were respected scientists
or
scientists were respected

accept measurements / results taken over several months

the experiment was repeated many times is insufficient

1

(c) Marks awarded for this answer will be determined by the Quality of Written Communication (QWC) as well as the standard of the scientific response. Examiners should also refer to the information on page 5 and apply a 'best-fit' approach to the marking.

0 marks
no relevant content

Level 1 (1−2 marks)
A brief description is given with some particles correctly named

Level 2 (3−4 marks)
A description is given with all three particles named
plus either
the polarity of charge associated with the
three particles
or
the relative mass of the three particles
or
the relative mass for one particle and the relative charge for one particle given

Level 3 (5−6 marks)
A more detailed description is given, naming the particles and polarity of charge
and either
the relative mass is given for at least two particles
or
the relative charge is given for at least two particles

Examples of the points made in the response

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brief description

contains protons, neutrons and electrons

protons are positive
electrons are negative
neutrons are uncharged

has a nucleus

relative charge

proton +1
electron − 1
neutron 0

relative mass

proton 1
neutron 1
electron (about) 1 / 2000

accept protons and neutrons have the same mass

accept electrons have tiny / negligible mass
zero mass is neutral

more detailed description

protons and neutrons make up the nucleus
electrons orbit the nucleus
electrons are in shells
most of the atom is empty space
nucleus occupies a very small fraction of the volume of the atom
electrons orbit at a relatively large distance from the nucleus
most of the mass of the atom is contained in the nucleus
the nucleus as a whole is positively charged total number of protons in the nucleus equals the total number of electrons orbiting it in an atom

6

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