

Name of the Student: _____

Max. Marks : 19 Marks

Time : 19 Minutes

Mark Schemes

Q1.

- | | | |
|-------|--|---|
| (a) | 78 | 1 |
| (b) | atomic | 1 |
| (c) | (i) 131 | |
| | <i>correct order only</i> | 1 |
| | 54 | 1 |
| (ii) | 32 (days) | |
| | <i>allow 1 mark for showing 4 half-lives provided no subsequent step</i> | 2 |
| (iii) | limits amount of iodine-131 / radioactive iodine that can be absorbed | |
| | <i>accept increases level of non-radioactive iodine in thyroid</i> | |
| | <i>do not accept cancels out iodine-131</i> | 1 |
| | so reducing risk of cancer (of the thyroid) | |
| | <i>accept stops risk of cancer (of the thyroid)</i> | 1 |
- [8]**

Q2.

- | | | |
|-----|--|---|
| (a) | protons, electrons | |
| | <i>both required, either order</i> | 1 |
| | neutrons | 1 |
| | electron, nucleus | |
| | <i>both required, this order</i> | 1 |
| (b) | 2.7 (days) | |
| | <i>allow 1 mark for showing correct use of the graph</i> | 2 |

- (c) 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

or

put source into water at three points on bank (1)
see if radiation is detected downstream of factory **or** farmland **or** sewage treatment works (1)

1

[7]

Q3.

any **two** pairs from:

to gain credit it must be clear which model is being described
*do **not** accept simple descriptions of the diagram without comparison*

- nuclear model mass is concentrated at the centre / nucleus (1)
*accept the nuclear model has a nucleus / the plum pudding model does not have a nucleus for **1** mark*

plum pudding model mass is evenly distributed (1)

- nuclear model positive charge occupies only a small part of the atom (1)

plum pudding model positive charge spread throughout the atom (1)

- nuclear model electrons orbit some distance from the centre (1)
accept electrons in shells / orbits provided a valid comparison is made with the plum pudding model

plum pudding electrons embedded in the (mass) of positive (charge) (1)
*do **not** accept electrons at edge of plum pudding*

- nuclear model the atom mainly empty space (1)

plum pudding model is a 'solid' mass (1)

[4]