

Name of the Student: _____

Max. Marks : 18 Marks

Time : 18 Minutes

Mark Schemes

Q1.

- | | | |
|-----|--|---|
| (a) | 148 | 1 |
| (b) | D and E | 1 |
| (c) | line between B and 86 protons | 1 |
| | same line between B and 222 mass number | 1 |
| (d) | can't predict which nucleus will decay next | |
| | or | |
| | can't predict when a (particular) nucleus will decay | 1 |
| (e) | one alpha decay would decrease proton number by 2 | 1 |
| | two beta decays would increase proton number by 2 | 1 |
| | so the proton / atomic number of the final nucleus is the same as the proton / atomic number of the original nucleus | |
| | <i>this mark is dependent on scoring the first two marks</i> | 1 |
- [8]**

Q2.

- | | | |
|-----|--|---|
| (a) | Any one from: | |
| | • (medical) x-rays | |
| | <i>allow CT scans</i> | |
| | • radiotherapy | |
| | • nuclear weapons (testing) | |
| | <i>allow nuclear fallout</i> | |
| | • named nuclear disaster e.g. Chernobyl / Fukushima / Three Mile Island. | |
| | <i>ignore radioactive / nuclear waste</i> | 1 |
| (b) | uranium / plutonium | |
| | <i>ignore any number given</i> | |

allow thorium

1

- (c) neutron absorbed by a uranium nucleus

1

nucleus splits into two parts

allow an atom splits into two parts if 1st marking point doesn't score

1

and (2/3) neutrons (are released)

1

and gamma rays (are emitted)

1

- (d) lighter nuclei join to form heavier nuclei

allow specific examples

1

some of the mass (of the nuclei) is converted to energy (of radiation)

1

- (e) activity decreases quickly

allow nuclei / waste will decay at a greater rate

ignore waste is radioactive for less time

1

risk of harm decreases quickly

allow burial site doesn't need to be monitored for as long

or

doesn't need to be buried underground for as long

or

may not need to be buried underground

1

[10]