

Name of the Student: \_\_\_\_\_

Max. Marks : 21 Marks

Time : 21 Minutes

**Q1.**

A radioactive source emits alpha, beta and gamma radiation.

- (a) An alpha particle is the same as a helium nucleus.

How many times bigger is the radius of a helium atom than the radius of an alpha particle?

Tick (✓) **one** box.

Less than 100 times bigger

Exactly 5000 times bigger

More than 10 000 times bigger

(1)

- (b) Alpha particles can ionise atoms in the air.

What happens to an atom when it is ionised by an alpha particle?

Tick (✓) **two** boxes.

A neutron in the atom becomes a proton.

The atom becomes a positive ion.

The atom gains a neutron.

The atom gains a proton.

The atom loses an electron.

(2)

- (c) A spark detector is a device that can be used to detect alpha radiation.



A polonium-210 (Po) nucleus emits an alpha particle ( $\alpha$ ) and turns into a lead (Pb) nucleus.

This can be represented by the equation:



(a) What is the value of A in the equation?

Tick (✓) **one** box.

A = 206     A = 208     A = 210     A = 211

(1)

(b) What is the value of Z in the equation?

Tick (✓) **one** box.

Z = 80     Z = 82     Z = 85     Z = 86

(1)

(c) A strontium-89 nucleus (Sr) emits a beta particle ( $\beta$ ) and turns into an yttrium nucleus (Y).

This can be represented by the equation:



What are the values of A and Z in the equation?

A = \_\_\_\_\_  
Z = \_\_\_\_\_

(2)

(d) Gamma radiation is another type of nuclear radiation.

What does gamma radiation consist of?

Tick (✓) **one** box.

High energy neutrons

Electromagnetic waves

Particles with no charge

Positively charged ions

(1)

