The Nuclear Atom

Question Paper 1

Level	IGCSE
Subject	Physics (0625/0972)
Exam Board	Cambridge International Examinations (CIE)
Topic	General Physics
Sub-Topic	The Nuclear Atom
Booklet	Question Paper 1

Time allowed: **15 minutes**

Score: **/12**

Percentage: **/100**

Grade Boundaries:

9	8	7	6	5	4	3	2	1
>85%	75%	68%	60%	55%	50%	43%	35%	<30%

Energy is released in some nuclear reactions.

Which nuclear reaction takes place in a nuclear power station, and which nuclear reaction takes place in the Sun?

	nuclear power station	the Sun
A	fission	fission
B	fission	fusion
C	fusion	fission
D	fusion	fusion

A certain element has several isotopes.

Which statement about these isotopes is correct?

A. They must have different numbers of electrons orbiting their nuclei.

B. They must have the same number of neutrons in their nuclei.

C. They must have the same number of nucleons in their nuclei.

D. They must have the same number of protons in their nuclei.

A very important experiment increased scientists' understanding of the structure of matter.

In the experiment, particles scattered as they passed through a thin metal foil.

Which particles were used, and to which conclusion did the experiment lead?

	particles	conclusion
A	alpha particles	matter is made up of atoms
B	alpha particles	atoms have a very small nucleus
C	beta particles	matter is made up of atoms
D	beta particles	atoms have a very small nucleus

Below are the symbols for five different nuclides.

$^{35}_{17}X$	$^{37}_{17}X$	$^{38}_{18}X$	$^{81}_{35}X$	$^{81}_{37}X$
nuclide 1	nuclide 2	nuclide 3	nuclide 4	nuclide 5

Which two nuclides are isotopes of the same element?

A. nuclide 1 and nuclide 2

B. nuclide 2 and nuclide 3

C. nuclide 2 and nuclide 5

D. nuclide 4 and nuclide 5

Below are four statements about isotopes of a certain element.

Which statement about the isotopes **must** be correct?

A. They are radioactive.

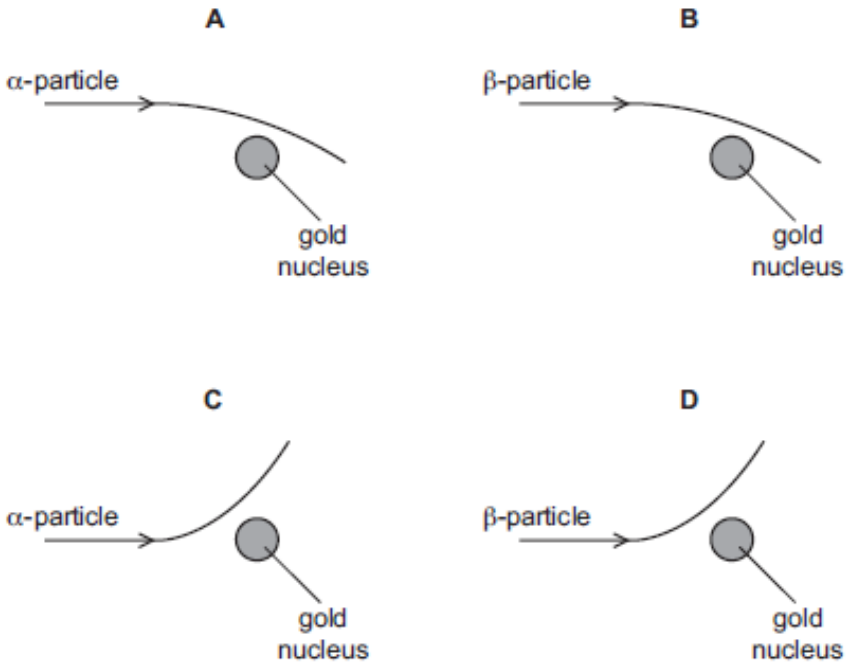
B. They are unstable.

C. They have the same number of neutrons.

D. They have the same number of protons.

Question 6

Which diagram represents an experiment that provided evidence for the nuclear atom?



$^{14}_{6}C$ is a nuclide of carbon.

What is the composition of one nucleus of this nuclide?

	neutrons	protons
A	6	8
B	6	14
C	8	6
D	14	6

Question 8

A nuclide has the symbol $^{22}_{10}Ne$.

What is the proton number of a nucleus of this nuclide?

A 10 B 12 C 22 D 32

The nucleus of an americium atom contains 146 neutrons and 95 protons. It decays by emitting an α-particle.

How many neutrons and how many protons remain in the nucleus when this form of americium decays?

	number of neutrons remaining	number of protons remaining
A	142	93
B	142	95
C	144	93
D	144	95

Which statement is correct for the nucleus of **any** atom?

A. The nucleus contains electrons, neutrons and protons.

B. The nucleus contains the same number of protons as neutrons.

C. The nucleus has a total charge of zero.

D. The nucleus is very small compared with the size of the atom.

Question 11

The nuclide symbol for radioactive polonium is $^{210}_{84}Po$.

A nucleus of this type of polonium emits an α-particle.

What is the proton number (atomic number) of the nucleus after it has emitted the α-particle?

A 82 B 83 C 84 D 85

Question 12

The nuclide notation for radium-226 is $^{226}_{88}Ra$.

How many electrons orbit the nucleus of a neutral atom of radium-226?

A 0 B 88 C 138 D 226