

Q1.

The typical size of an atom is

(1)

- A** 10^{-5} m
- B** 10^{-10} m
- C** 10^{-15} m
- D** 10^{-20} m

(Total for question = 1 mark)

Q2.

Figure 7 shows the nuclei of four atoms.

$^{234}_{92}\text{U}$ uranium-234	$^{235}_{92}\text{U}$ uranium-235	$^{238}_{94}\text{Pu}$ plutonium-238	$^{238}_{95}\text{Am}$ americium-238
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Figure 7

Which two nuclei have the same number of neutrons?

(1)

- A** plutonium-238 and uranium-235
- B** uranium-235 and americium-238
- C** uranium-234 and americium-238
- D** americium-238 and plutonium-238

(Total for question = 1 mark)

Q3.

What is the approximate size of a hydrogen atom?

(1)

- A 10^{-3} m
- B 10^{-10} m
- C 10^{-19} m
- D 10^{-31} m

(Total for question = 1 mark)

Q4.

The fuel in a nuclear power station is an isotope of uranium.

The symbol for a nucleus of this uranium isotope is ${}_{92}^{235}\text{U}$.

(i) How many protons are there in a nucleus of this isotope?

Put a cross () in the box next to your answer.

(1)

- A 92
- B 143
- C 235
- D 327

(ii) Name another particle in a nucleus of this isotope.

(1)

.....

Q5.

Answer the questions with a cross in the boxes you think are correct . If you change your mind about an answer, put a line through the box and then mark your new answer with a cross .

Figure 3 shows the symbol for the nucleus of an atom of strontium-90.

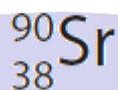


Figure 3

(i) How many protons are in the nucleus of an atom of strontium-90?

- A 38
- B 52
- C 90
- D 128

(1)

(ii) How many neutrons are in the nucleus of an atom of strontium-90?

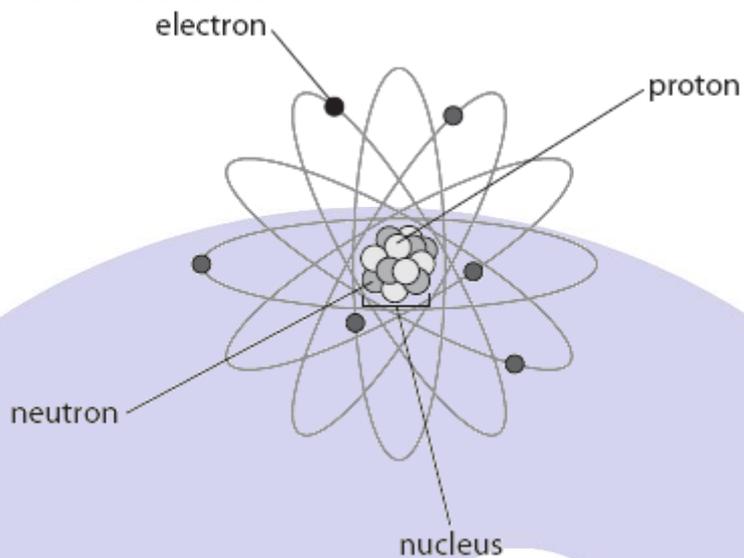
- A 38
- B 52
- C 90
- D 128

(1)

(Total for question = 2 marks)

Q6.

The diagram shows the structure of an atom.



(i) Complete the sentence by putting a cross () in the box next to your answer.
The size of the charge on each electron is

- A** a third of the charge on the proton
- B** half the charge on the proton
- C** the same as the charge on the proton
- D** twice the charge on the proton

(1)

(ii) Complete the sentence by putting a cross () in the box next to your answer.
The atomic number of a neutral atom is always the same as the number of

- A** electrons
- B** electrons and neutrons
- C** protons and neutrons
- D** neutrons

(1)

(Total for question = 2 marks)

Q7.

- (ii) Beryllium-9 has an atomic number of 4 and a mass number of 9.
A nucleus of this isotope can be described using this symbol.



Complete the sentence by putting a cross () in the box next to your answer.
The number of neutrons in this nucleus is

(1)

- A 4
- B 5
- C 9
- D 13

- (iii) Which one of these symbols describes the nucleus of a different isotope of beryllium?
Put a cross () in the box next to your answer.

(1)



A



B



C



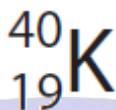
D

(Total for question = 2 marks)

Q8.

One isotope of the element potassium is potassium-40.

A nucleus of potassium-40 is represented by:



(i) Complete the sentence by putting a cross (☒) in the box next to your answer.

The number of neutrons in a nucleus of potassium-40 is

- A** 19
- B** 21
- C** 40
- D** 59

(1)

(Total for question = 1 marks)

Q9.

Figure 3 shows the structure of an oxygen-14 atom.

(i) Complete the four labels on Figure 3.

(4)

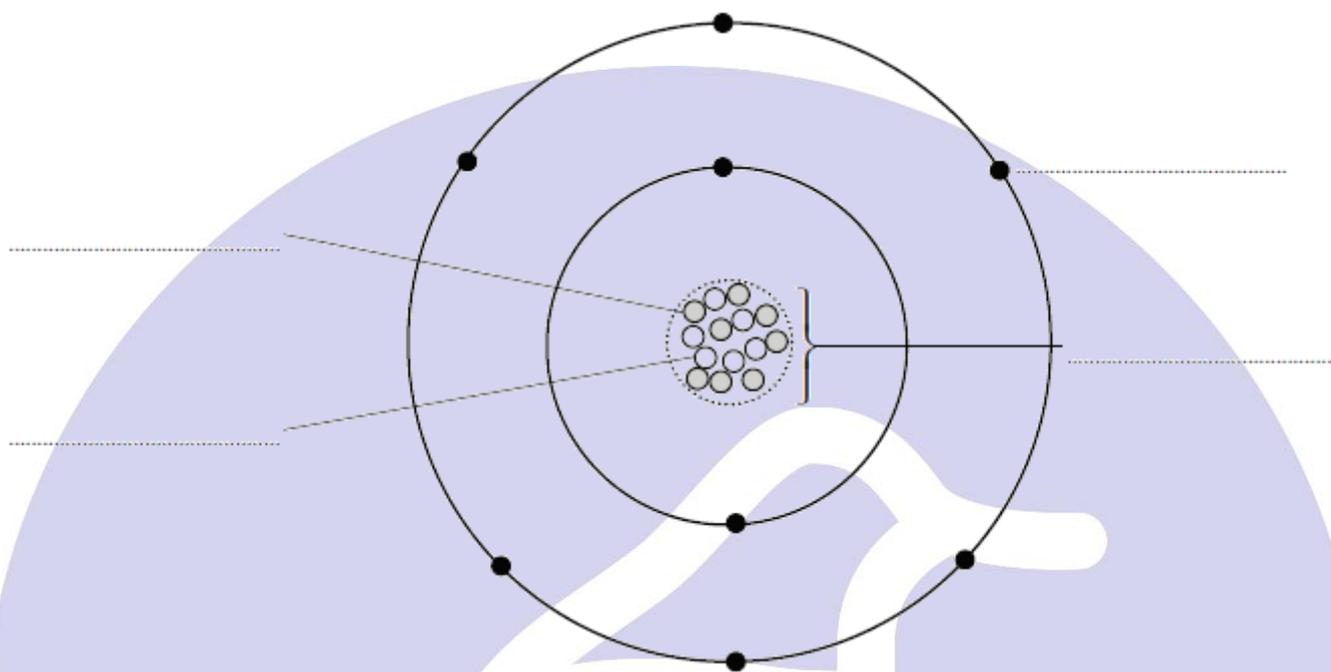


Figure 3

(ii) Which of these particles has a negative charge?

(1)

- A** alpha particle
- B** electron
- C** neutron
- D** nucleus

(iii) State the overall charge of the oxygen-14 atom.

(1)

.....
.....

(Total for question = 6 marks)

Q10.

Sulfur-35 is a radioactive isotope of sulfur.

Figure 8 represents a nucleus of sulfur-35.

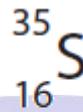


Figure 8

Draw one line from each type of particle to the number of that type of particle in a nucleus of sulfur-35.

(3)

type of particle

number of particles

proton

35

neutron

16

nucleon

51

19

(Total for question = 3 marks)

Q11.

An atom has a central nucleus containing neutrons and protons.

Electrons orbit the nucleus.

One isotope of carbon is carbon 14.



(i) State the number of protons in one atom of carbon 14.

(1)

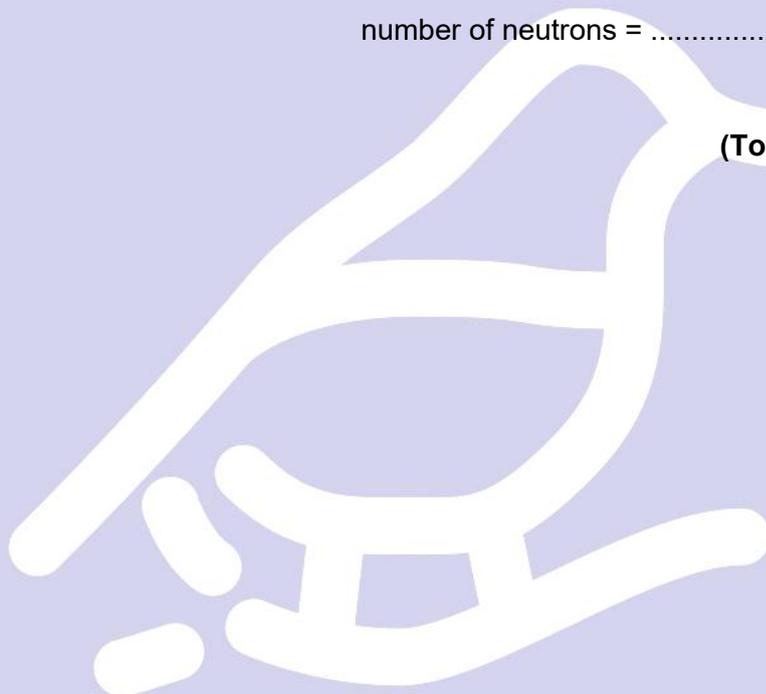
number of protons =

(ii) State the number of neutrons in one atom of carbon 14.

(1)

number of neutrons =

(Total for question = 2 marks)



Q12.

Answer the question with a cross in the box you think is correct . If you change your mind about an answer, put a line through the box and then mark your new answer with a cross .

An atom has a central nucleus containing neutrons and protons.

Electrons orbit the nucleus.

(i) Which row of the table gives the relative mass and charge of a proton?

(1)

	relative mass	charge
<input checked="" type="checkbox"/> A	0	+1
<input checked="" type="checkbox"/> B	0	-1
<input checked="" type="checkbox"/> C	1	+1
<input type="checkbox"/> D	1	-1

(ii) An atom has a radius of 1.0×10^{-10} m.

A nucleus has a radius of 1.0×10^{-15} m.

Calculate the ratio of the radius of the atom to the radius of the nucleus.

(2)

ratio of radius of atom to radius of nucleus =

(iii) Explain why an atom has no charge overall.

(2)

.....

.....

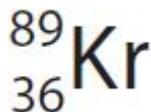
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(Total for question = 5 marks)

Q13.

An isotope of krypton, krypton-89, is produced in a nuclear reactor.
A nucleus of this isotope can be represented as



Describe the structure of a nucleus of krypton-89.

(4)

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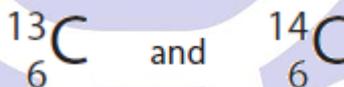
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Q14.

Carbon-13 and carbon-14 are isotopes of carbon.

Nuclei of carbon-13 and carbon-14 can be represented by these symbols



Complete the table for an atom of carbon-13 and an atom of carbon-14.

(2)

	number of neutrons in the nucleus	number of electrons in orbit around the nucleus
carbon-13		
carbon-14		

(Total for question = 2 marks)