

Q1. (2018) – 2a (ii)

- (ii) Nickel is a metal.

(2)

These letters are not the symbols of the atoms of these elements.

[illegible]

Figure 1

- A)

- (2)

(ii) All atoms of element **E** in this sample contain

- ☐ **A** 5 protons
- ☐ **B** 5 neutrons
- ☐ **C** 6 protons
- ☐ **D** 6 neutrons

(1)

(c) Element **X** has an atomic number of 18.

(1)

Q3. (2020)

6 Titanium and iron are examples of transition metals.

(a) Figure 6 shows the percentage abundance of each isotope in a sample of titanium.

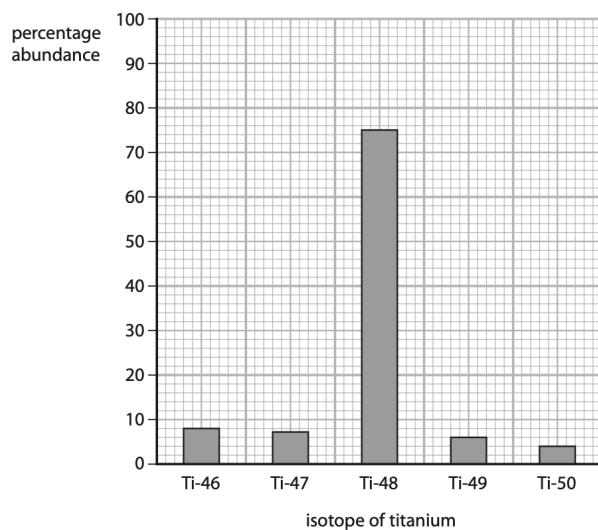


Figure 6

Calculate the relative atomic mass of titanium in this sample.

(3)

Q4. (2020)

8 (a) Calcium has an atomic number of 20.

A calcium atom has a mass number of 40.

A)

(i) Which row of the table shows the number of protons and number of neutrons in this atom of calcium?

(1)

	number of protons	number of neutrons
☐ A	20	20
☐ B	40	20
☐ C	20	60
☐ D	60	20

B)

(ii) Figure 8 shows the arrangement of electrons in an atom of calcium.

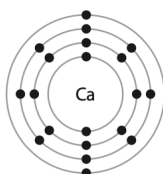


Figure 8

Explain, using the information in Figure 8, in which period of the periodic table calcium can be found.

(2)

Q5. (2021)

2 The scientist John Dalton lived over 200 years ago.

(a) John Dalton suggested an early model of atoms.

When Dalton first described atoms he said that

- all elements are made of atoms
- atoms are not formed of any smaller particles
- all atoms of the same element are identical.

Give two differences between Dalton's model of atoms and today's model of atoms.

(2)

Q6. (2021)

9 (a) An ion of element X can be represented as



This ion of element X has 54 electrons.

Calculate the number of protons and the number of neutrons in this ion.

(2)

number of protons

number of neutrons

Q7. (2021) – 9b

A)

(b) A sample of silicon contains isotopes.

(i) State, in terms of subatomic particles, how atoms of these isotopes are the same.

(1)

B)

(ii) This sample of silicon contains three isotopes.

- 92% of the atoms are silicon-28
- 5% of the atoms are silicon-29
- 3% of the atoms are silicon-30

Calculate the relative atomic mass of silicon in this sample.

(2)

Q8. (2022) – 1c

(c) A copper atom has a diameter of 0.256 nm.

What is the size of this copper atom in metres?

(1)

- ☐ A 2.56×10^{-8}
- ☐ B 2.56×10^{-9}
- ☐ C 2.56×10^{-10}
- ☐ D 2.56×10^{-11}

Q9. (2022)

3 Magnesium carbonate has the formula MgCO_3 .

(a) Magnesium carbonate contains Mg^{2+} and CO_3^{2-} ions.

(i) The atomic number of magnesium is 12.

What is the electronic configuration of the Mg^{2+} ion?

(1)

- ☐ A 2
- ☐ B 2.8
- ☐ C 2.8.2
- ☐ D 2.8.4

Q10. (2023)

- 1 (a) Figure 1 shows information about two isotopes of hydrogen, **A** and **B**.

Complete the table to show the number of subatomic particles in each isotope.

(2)

	isotope A	isotope B
atomic number	1	1
mass number	1	2
number of protons		
number of electrons		
number of neutrons		

Figure 1

Q11. (2024) – 1c

- (c) An iron atom has a diameter of 2.52×10^{-10} m.

What is the size of this iron atom in nanometres?

(1)

- ☐ **A** 2.52
- ☐ **B** 0.252
- ☐ **C** 0.0252
- ☐ **D** 0.00252

Q12. (2024)

- 3 Sodium carbonate has the formula Na_2CO_3 .

- (a) Sodium carbonate contains Na^+ ions and CO_3^{2-} ions.

- (i) The atomic number of sodium is 11.

What is the electronic configuration of the Na^+ ion?

(1)

- ☐ **A** 1
- ☐ **B** 2.8
- ☐ **C** 2.8.1
- ☐ **D** 2.8.2