Past-paper walk-through

Arrangement of elements ▪ 8.1

eXercise

Questions in this set

- 0620/21 N25 Q23 ▪ 1 mark
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Question 23

0620/21 N25 ▪ Q23 ▪ 1 mark

23 The ions formed when element X and element Y react together are shown.

- Element X forms X^- ions.
- Element Y forms Y^{2+} ions.

Which row identifies the position of X and of Y in the Periodic Table?

	X	Y
A	Group I	Group VI
B	Group VII	Group II

Question 23

C	Group VII	Group VI
D	Group I	Group II

Solution 23

Answer: **B**

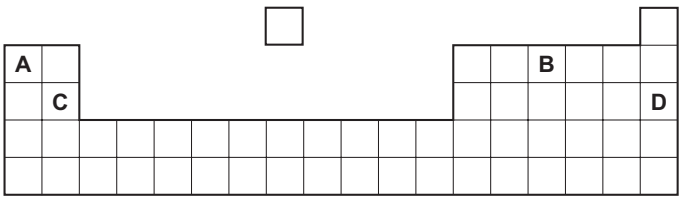
Why

- An element that forms a negative ion has *gained* electrons, so it is a non-metal.
- Gaining one electron to form X^- means it had seven outer electrons – Group VII.
- Losing two to form Y^{2+} means it had two outer electrons – Group II.

Question 23

0620/23 N25 ▪ Q23 ▪ 1 mark

23 The Periodic Table shows the position of four different elements.



Which row is correct?

	element	number of electrons in the outer shell

Question 23

A	non-metal	1
B	metal	5
C	metal	2
D	non-metal	7

Solution 23

Answer: **C**

Why

- Read the group from the column: Group I has one outer electron, Group II two, Group VII seven.
- Metals are on the left of the table and non-metals on the right.
- So a Group II element is a metal with two electrons in its outer shell.

Question 21

0620/21 J25 ▪ Q21 ▪ 1 mark

21 The properties of the elements change from left to right across the Periodic Table.

Which statement describes how the properties change across Period 3?

A Elements change from gases to solids.

B Elements change from non-conductors to electrical conductors.

C Elements change from metal to non-metal.

D Elements have a decreasing number of electron shells.

Solution 21

Answer: **C**

Why

- Across a period the elements change from metals on the left to non-metals on the right.
- So electrical conductivity falls and the oxides change from basic to acidic.
- They do not simply change from gases to solids – sodium is already a solid.

Question 22

0620/23 J25 ▪ Q22 ▪ 1 mark

22 Element X is in the same group of the Periodic Table as silicon.

An atom of element X has more protons than a silicon atom.

Which element could be X?

A aluminium

B carbon

C germanium

Question 22

D phosphorus

Solution 22

Answer: **C**

Why

- Silicon is in Group IV, so X must also be in Group IV.
- More protons than silicon means X is *below* silicon in that group.
- Carbon is above it, and aluminium and phosphorus are in different groups – so germanium.

Question 25

0620/22 M25 ▪ Q25 ▪ 1 mark

25 The elements oxygen and sulfur are in the same group of the Periodic Table.

Which statement about oxygen and sulfur is **not** correct?

A They are non-metals.

B They have giant covalent structures.

C They have six electrons in the outer electron shells of their atoms.

D They react together to form an acidic oxide.

Solution 25

Answer: **B**

Why

- Oxygen (O_2) and sulfur (S_8) are both *simple molecular*, not giant covalent.
- Both are non-metals in Group VI, so both have six outer electrons.
- The giant covalent claim is therefore the incorrect statement.