

Max. Marks: 15

Time: 15 Minutes

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**1**

Which statement describes the bonding in sodium chloride?

- A** A shared pair of electrons between two atoms leading to a noble gas configuration.
- B** A strong force of attraction between oppositely charged ions.
- C** A strong force of attraction between two molecules.
- D** A weak force of attraction between oppositely charged ions.

**[1]****2**

A covalent molecule M contains a total of four shared electrons.

What is M?

- A** ammonia,  $\text{NH}_3$
- B** hydrogen chloride,  $\text{HCl}$
- C** methane,  $\text{CH}_4$
- D** water,  $\text{H}_2\text{O}$

**[1]****3**

What is the relative molecular mass,  $M_r$ , of  $\text{HNO}_3$ ?

- A** 5
- B** 31
- C** 32
- D** 63

**[1]**

## 4 C

Iron is a metal. The structure of iron is described as a lattice of positive ions in a sea of electrons.

Which of the following statements about iron are correct?

- 1 iron conducts electricity because the electrons are free to move
- 2 iron has a high melting point due to the strong covalent bonds
- 3 iron is an alloy
- 4 iron is malleable because the layers of atoms can slide over one another

- A** 1 only  
**B** 1 and 3  
**C** 1 and 4  
**D** 2, 3 and 4

Which two elements react together to form an ionic compound?

element	electronic structure
R	2,4
T	2,8
X	2,8,1
Z	2,8,7

- A** R and T      **B** T and X      **C** X and Z      **D** Z and R

[1]

## 5 C

[1]

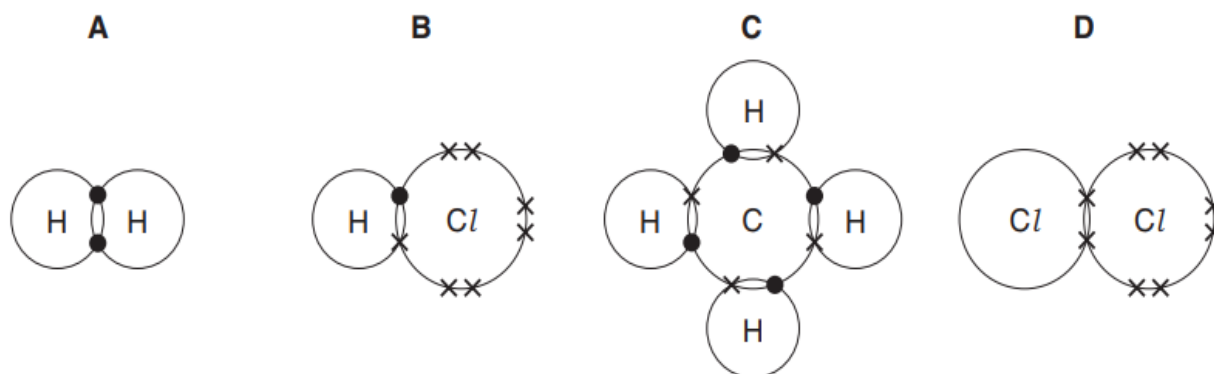
6

Element X forms an acidic, covalent oxide.

Which row shows how many electrons there could be in the outer shell of an atom of X?

	1	2	6	7
A	✓	✓	✗	✗
B	✓	✗	✓	✗
C	✗	✗	✓	✓
D	✗	✓	✗	✓

Which diagram does **not** show the outer shell electrons in the molecule correctly?



[1]

# 8

Magnesium, calcium and strontium are Group II elements.

(a) Complete Table 2.1 to show the electronic configuration of a calcium atom.

**Table 2.1**

shell	1st	2nd	3rd	4th
number of electrons				

[1]

(b) Describe how the electronic configuration of a strontium atom is:

(i) similar to the electronic configuration of a calcium atom

.....  
..... [1]

(ii) different from the electronic configuration of a calcium atom.

.....  
..... [1]

[3]

9

Magnesium reacts with chlorine to form magnesium chloride,  $MgCl_2$ .

Magnesium chloride is an ionic compound.

(i) Complete the dot-and-cross diagram in Fig. 2.1 of the ions in magnesium chloride.

Show the charges on the ions.

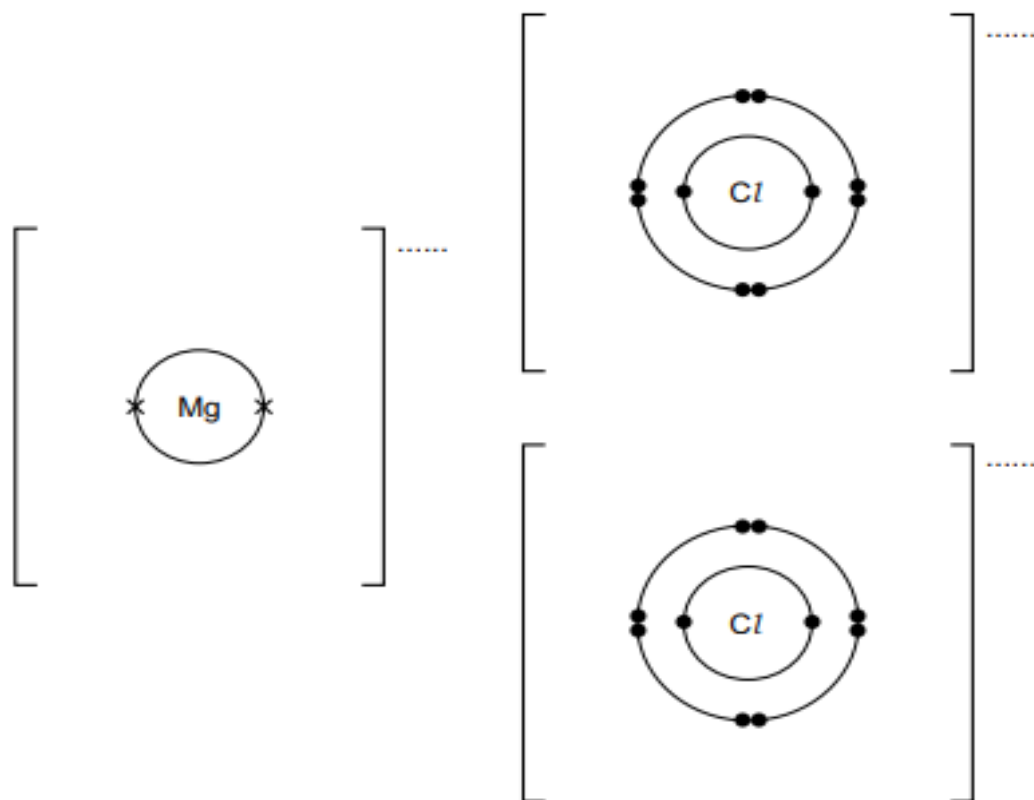


Fig. 2.1

[3]

(ii) One physical property typical of ionic compounds, such as  $MgCl_2$ , is that they are soluble in water.

Give two **other** physical properties that are typical of ionic compounds.

1 .....

2 .....

[2]

[5]