

G9 End of Semester 1 Science Practice Paper #4

- 1 (a) A molecule of methane contains one carbon atom bonded to four hydrogen atoms.

This bonding, shown in Fig. 2.1, involves shared pairs of electrons.

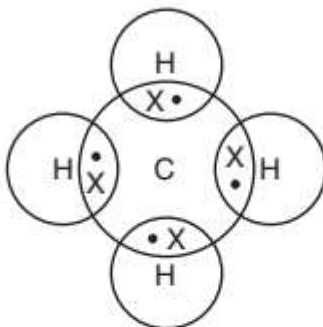


Fig. 2.1

- (i) State the type of chemical bonding shown in Fig. 2.1.

..... [1]

- (ii) State the type of elements that bond together by sharing pairs of electrons.

..... [1]

0653/31/M/J/17 No.2(a)

- 2 Table 7.1 shows the mass of some of the contents of three foods in a 100 gram sample of each food.

Table 7.1

food	number of grams in the 100 gram food sample			
	fat	carbohydrate	protein	water
bread	7	60	13	20
egg	11	1	13	75
milk	3	5	3	89

- (a) State the **two** nutrient groups needed for a balanced diet which are missing from Table 7.1.

..... and [2]

- (b) The energy for the body provided by one gram of each nutrient is shown below.

fat 37kJ carbohydrate 17kJ protein 17kJ

A student cooked a meal using 100 grams of eggs.

Use the information contained in Table 7.1 to calculate the energy provided by the 100 grams of eggs.

Show your working.

energy provided = kJ [2]

3 Fig. 8.1 shows some uses of copper.

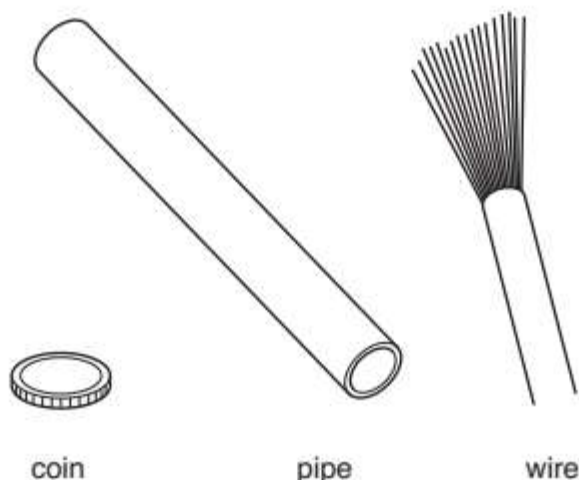
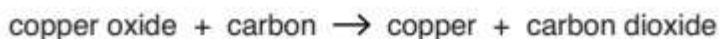


Fig. 8.1

Copper is extracted from copper oxide by reacting it with carbon.

The word equation for this reaction is:



(a) (i) Name the collection of metals in the Periodic Table which includes copper.

..... [1]

(ii) Use the word equation to identify the substance which is being reduced during the extraction of copper from copper oxide.

..... [1]

(iii) A hairdryer is powered through a cable containing copper wire.

Copper is a good conductor of electricity.

State **one other** property of copper that makes it a suitable material for use in a power cable.

..... [1]

(iv) Suggest **one** reason why copper, rather than iron, is used to make water pipes.

..... [1]

(v) Explain why copper alloys, rather than pure copper, are used to make coins.

..... [1]

(b) Three metals are placed into beakers of dilute hydrochloric acid, as shown in Fig. 8.2.

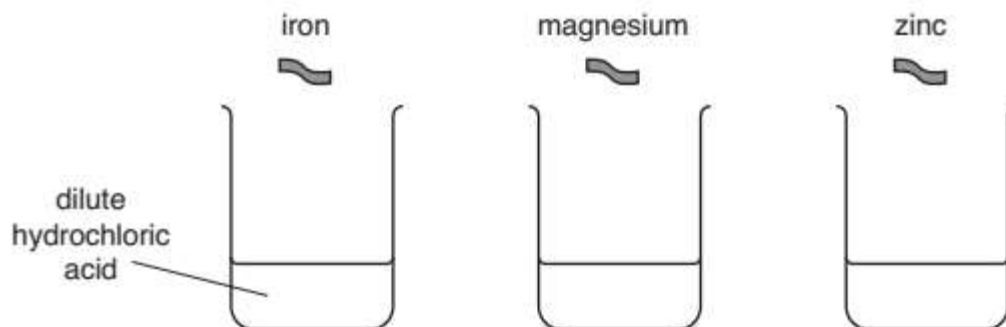


Fig. 8.2

State which of the three metals in Fig. 8.2 reacts most rapidly with dilute hydrochloric acid.

Name the gas which is made when this metal reacts with dilute hydrochloric acid.

metal

gas

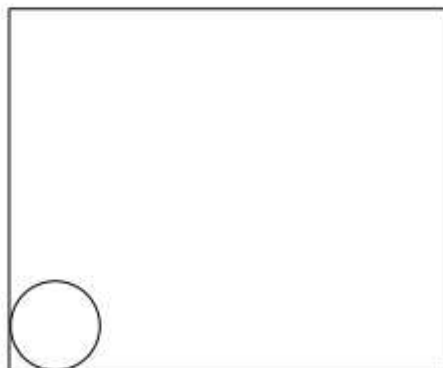
[2]

0653/31/M/J/17 No.8

4 Snow is made of solid ice crystals.

In the box below, draw a diagram to show the arrangement of particles in a solid.

One particle has been drawn for you. You need to draw at least 11 more.



[2]

0653/31/M/J/15 No.3 (d)

- 5 (a) Fig. 2.1 is a dot-and-cross diagram to show the outer-shell electrons in a molecule of hydrogen chloride, HCl.

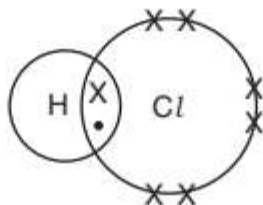


Fig. 2.1

- (i) State the type of chemical bond shown in Fig. 2.1.

..... [1]

- (ii) Draw a dot-and-cross diagram to show the outer-shell electrons in a molecule of methane, CH₄.

[2]

- 6 (a) Fig. 4.1 shows a drawing of a single-celled organism called *Euglena* as seen using a light microscope.

This organism has features of both plants and animals.

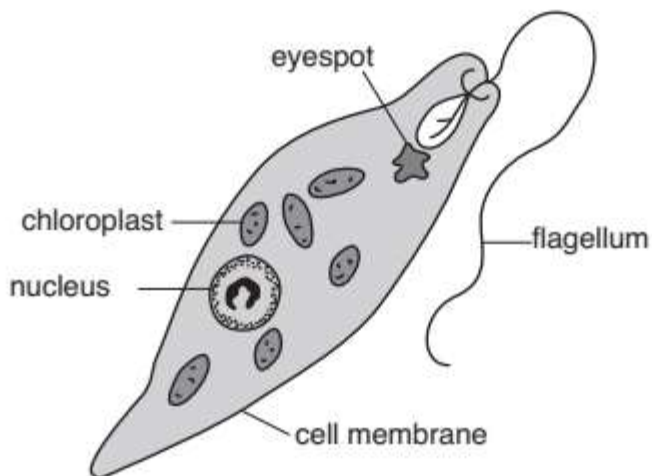


Fig. 4.1

- (i) Chloroplasts are usually found in plant cells.

Describe in detail the function of chloroplasts.

.....
.....
.....
.....
..... [3]

- (ii) Name **one** feature of *Euglena* you would more likely see in an animal than a plant.

Explain your answer.

feature

explanation

.....
.....

[2]

7 Chlorine, bromine, and iodine are Group VII elements.

(a) These three elements exist as molecules.

Fig. 2.1 shows the physical states of these elements.

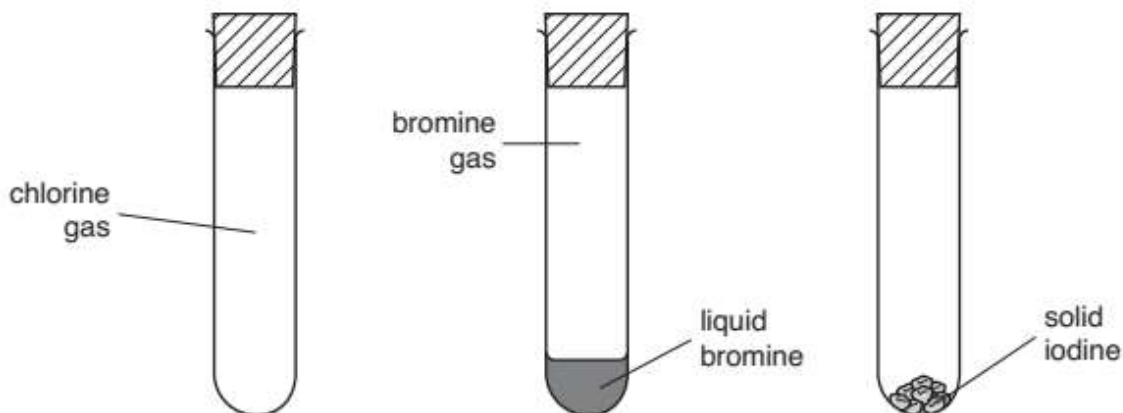


Fig. 2.1

(i) Explain what is meant by the term *molecule*.

Use ideas about atoms in your answer.

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

(ii) Name the change of state that occurs when liquid bromine turns into bromine gas.

..... [1]

(iii) State whether the change of state that occurs when liquid bromine turns into bromine gas is a physical change or a chemical change.

Explain your answer.

change

explanation

..... [1]

(b) Sodium reacts with chlorine in an exothermic reaction.

Sodium chloride, an ionic compound, is formed. This compound contains sodium ions and chloride ions.

(i) State what is meant by an *exothermic* reaction.

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

(ii) Fig. 2.2 shows the electronic structure of a sodium atom and of a chlorine atom.

Complete Fig. 2.2 to show the electronic structure of a sodium ion and of a chloride ion.

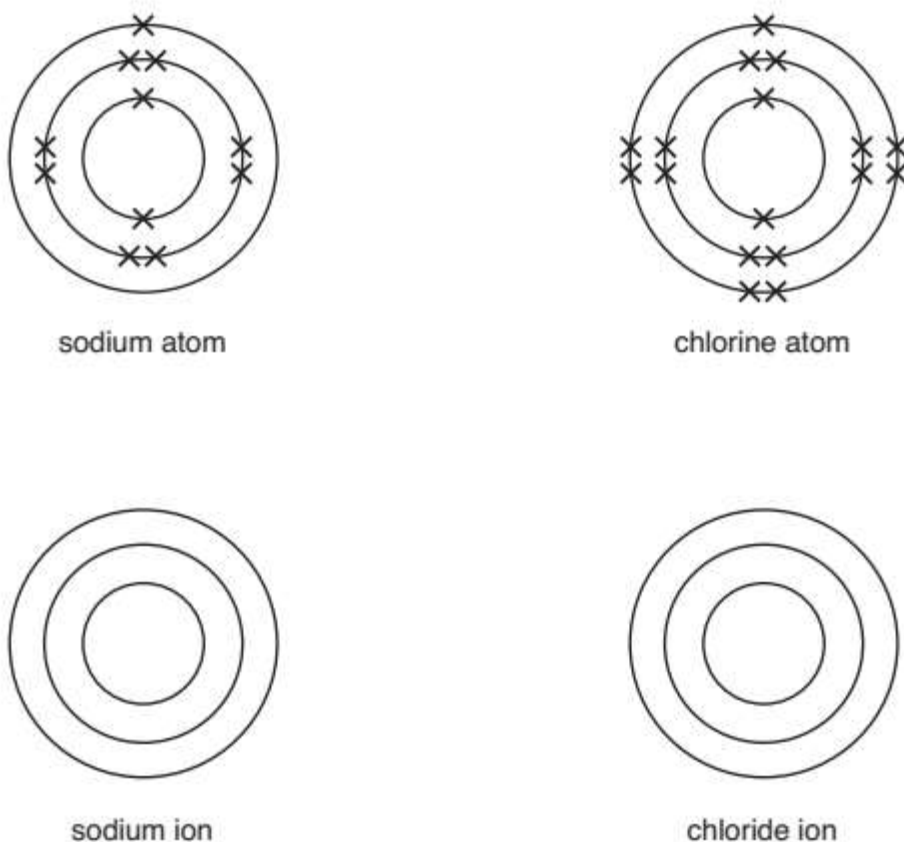


Fig. 2.2

[2]

(iii) Describe the electrical conductivity of solid sodium chloride and of liquid sodium chloride.

solid

liquid

[1]

(iv) Suggest the type of chemical bond that forms between carbon atoms and chlorine atoms.

Explain your answer.

type of chemical bond

explanation

.....

[1]

[Total: 8]

8 (a) Fig. 7.1 is a simplified diagram which shows the human alimentary canal.

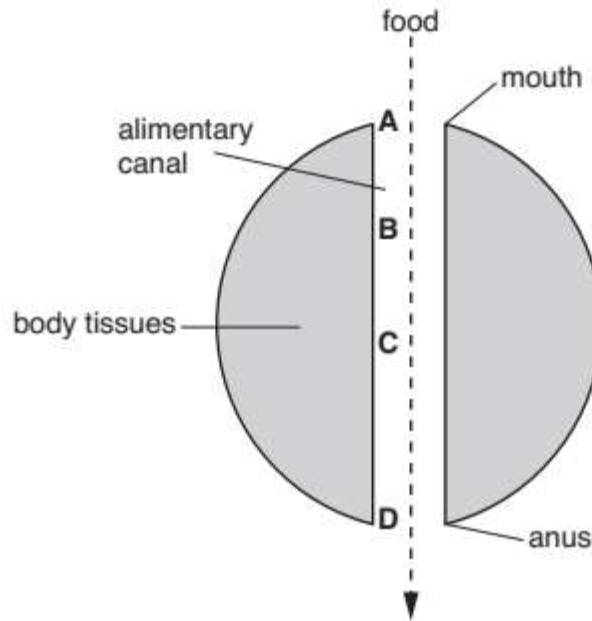


Fig. 7.1

The alimentary canal is a tube going through the body from mouth to anus. The tube is surrounded by body tissues.

The letters **A**, **B**, **C** and **D** show the basic stages of digestion of food.

On Fig. 7.2 the boxes on the left show the letters of the stages of digestion of food as shown in Fig. 7.1.

The boxes in the middle show the names of these stages.

The boxes on the right show descriptions of what is happening to the food.

Draw **one** line to link each letter with its stage, and draw **one** line to link each stage with its description. Stage **B**, digestion, is done for you.

letter of stage	name of stage	description
A	absorption	faeces leave the body
B	digestion	food is taken into the body
C	egestion	insoluble food molecules are broken down
D	ingestion	soluble food molecules enter the blood

Fig. 7.2

[3]

(b) Describe the function of the gall bladder.

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

(c) (i) State what is meant by the term *balanced diet* for humans.

.....
.....
..... [2]

(ii) State why proteins are needed as part of a balanced diet.

..... [1]

(iii) Describe the chemical test for protein, and the colour of the positive result.

chemical test

colour of positive result

[2]

[Total: 9]