Kinetic Particle Model of Matter

Question Paper

Course	CIE IGCSE Physics
Section	2. Thermal Physics
Topic	Kinetic Particle Model of Matter
Difficulty	Easy

Time Allowed 50

Score /37

Percentage /100

Question 1a

Table 6.1 gives a list of statements about molecules in gases and solids.

Table 6.1

statement	gas	solid
molecules are closely packed		
molecules are free to move around from place to place		
molecules are far apart compared to their size		
molecules can only vibrate about a fixed position		
molecules change position randomly		

Put one tick in every row to indicate whether each statement refers to a gas or a solid.

[4 marks]

Question 1b

Fig. 6.1 represents a smoke particle in air. The smoke particle is moving.

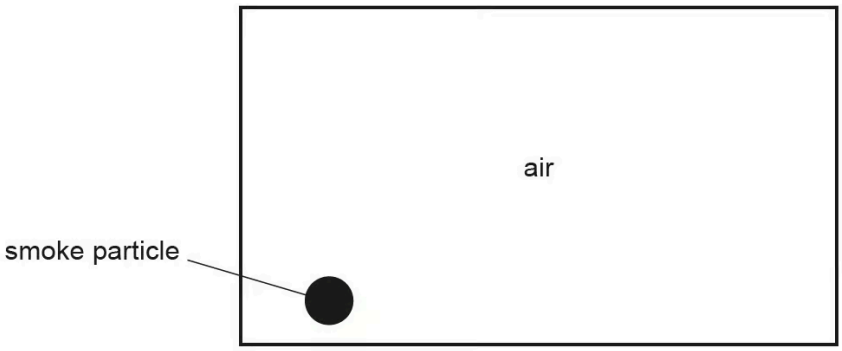

Fig. 6.1

Fig. 6.2 shows the path of the smoke particle and the position of the smoke particle a short time later.

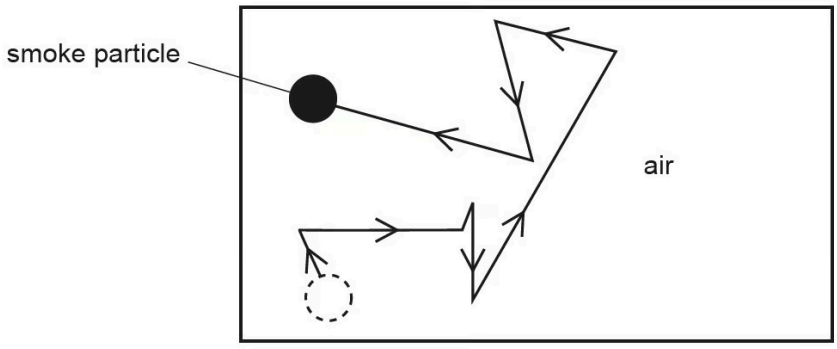

Fig. 6.2

(i) State the term given to the movement of the smoke particle.

[1]

(ii) State what the motion of the smoke particle shows about air molecules.

[3]

[4 marks]

Question 2a

A student draws diagrams that represent three states of matter, as shown in Fig. 4.1.

Box **B** shows the arrangement of particles in a liquid.

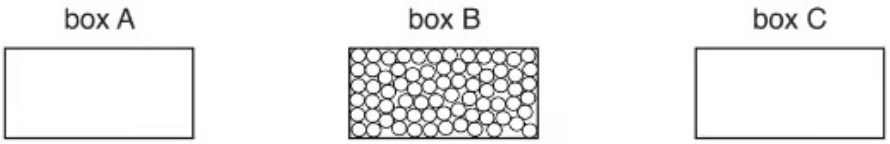

Fig. 4.1

(i) In box **A**, draw the arrangement of particles in a solid.

[1]

(ii) In box **C**, draw the arrangement of particles in a gas.

[1]

[2 marks]

Question 2b

Write the correct term for each change of state below each arrow in Fig. 4.2.

Fig. 4.2

[2 marks]

Question 2c

A wet beaker is in a warm room. After several hours the beaker is dry.

State and explain what happens to the water. Use your ideas about molecules in your answer.

[3 marks]

Question 3a

When a material is cooled or heated there may be a change of state.

Complete each statement by using words from the box. Each word can be used once, more than once or not at all.

condensation evaporation freezing melting

The change from solid to liquid is called .....

The change from liquid to gas is called .....

The change from liquid to solid is called .....

The change from gas to liquid is called ..... .

[4 marks]

Question 3b

Extended Tier Only

A student heats a gas and keeps its volume constant.

State and explain the effect on the pressure of the gas. In your answer, use your ideas about molecules.

[3 marks]

Question 4a

All matter is made up of atoms and molecules.

Describe the arrangement, separation and motion of gas molecules.

[3 marks]

Question 4b

The motion of smoke particles in air can be observed using a smoke cell and microscope.

Fig. 7.1 shows the arrangement.

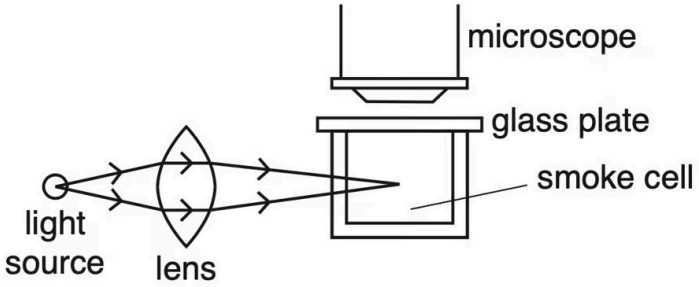

Fig. 7.1

Smoke is placed inside the glass smoke cell. Light enters from the side of the smoke cell.

A student looks through the microscope. She sees tiny spots of light moving. Each spot of light is a smoke particle.

Fig. 7.2 represents the path of a smoke particle seen in the eyepiece of the microscope.

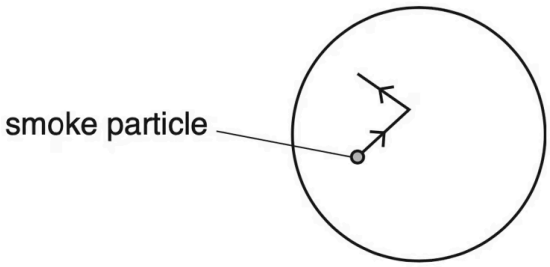

Fig. 7.2

(i) On Fig. 7.2, continue the path of the smoke particle.

[2]

(ii) State the term used to describe the movement of the smoke particle.

[1]

[3 marks]

Question 5a

Define *absolute zero*.

[2 marks]

Question 5b

Convert the following temperatures

(i) −93 °C into K

[2]

(ii) 428 K into °C

[2]

[4 marks]

Question 5c

Extended

In the list below, draw a ring around the state of matter that is the easiest to expand.

solid liquid gas

[1 mark]

Question 5d

Extended

In terms of its molecules, explain why the state of matter ringed in part (c) is the easiest to expand.

[2 marks]