Cambridge IGCSE Combined Science (0653)
Practice Paper 3

1 a i Write the word equation for photosynthesis.

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

ii Explain the importance of photosynthesis in food webs.

.....

.....

.....

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

b Leaves need water in order to carry out photosynthesis.
Water is transported from the roots to the leaves through tubes made of dead cells. Name these dead cells.

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

c Water is lost from leaves by transpiration. Table 1.1 shows the volume of water that was lost from a plant each hour, between 3 pm and 1 am.

Table 1.1

Time of day	3 pm	4 pm	5 pm	6 pm	7 pm	8 pm	9 pm	10 pm	11 pm	12 pm	1 am
Water loss / cm^3 per hour	15	15	13	10	7	7	5	2	2	1	1

i Describe how the rate at which water was lost from the plant changed during this 10-hour period.

.....

.....

.....

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

ii Suggest an explanation for the changes you have described in **i**.

.....

.....

.....

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

[Total = 10]

2 a Define the term *diffusion*.

.....

.....

.....

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

b A student partly filled three beakers with different liquids:

- distilled water
- dilute sugar solution
- concentrated sugar solution

He then cut three strips of tissue from a potato tuber. Each strip was 60 mm long.

He placed each strip into a different beaker. He labelled the beakers **A**, **B** and **C**.

He left the strips for 20 minutes, and then took them out of the beakers and measured them. His results are shown in Table 2.1.

Table 2.1

Beaker	Initial length of potato strip / cm	Final length of potato strip / cm	Change in length of potato strip / cm
A	10.0	8.2	
B	10.0	9.4	
C	10.0	10.8	

i Complete the table by calculating the change in length of each potato strip. **[2]**

ii Identify which beaker, **A**, **B** or **C**, contained each of the three different liquids.

distilled water .....

dilute sugar solution .....

concentrated sugar solution ..... **[1]**

iii The potato strip in Beaker **C** got longer because a substance from the beaker moved into it by diffusion. Name this substance, and state the term for the process by which it diffused into the potato strip.

Name of substance .....

Process ..... **[2]**

[Total = 8]

3 **a** Fig. 3.1 shows a small part of the human lungs.

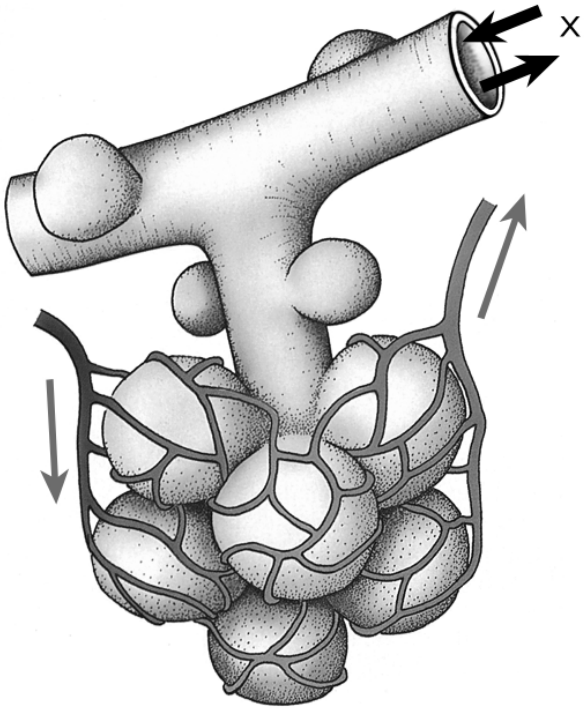


Fig. 3.1

The small, rounded structures shown in Fig. 3.1 are the site of gas exchange.

i Name these structures.

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

ii Describe what is shown by the arrows labelled **X**.

.....

.....

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

b During gas exchange, oxygen from the air is taken into the body and carbon dioxide is removed.

i Explain why the body needs to take in oxygen and remove carbon dioxide.

.....

.....

.....

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

ii Describe how you could compare the amount of carbon dioxide in inspired air and expired air.
You can draw a diagram if it helps your answer.

.....

.....

.....

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

[Total = 9]

4 Below is a list of elements. Use these elements to answer the questions below. Each element maybe used once, more than once or not at all.

aluminium
helium
magnesium
potassium
nitrogen
oxygen
phosphorus

a Which two elements are in Period 2 of the Periodic Table?

..... and ..... **[2]**

b Which three elements are gases at room temperature?

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

c Which element reacts with water to form an alkali?

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

d Which two elements have two electrons in their outside orbit?

..... and ..... **[2]**

[Total = 7]

5 A student made a soluble salt of the metal zinc by the following method.

A Acid was poured into a beaker.

B Zinc was added to the acid until in excess.

C The beaker was warmed and then stirred.

D When the reaction was over, the remaining zinc was removed.

E The solution was then boiled gently until crystallisation point.

F The remaining solution was left to cool.

a How would the student know that excess zinc had been added?

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

b In the space below draw and label apparatus suitable to perform step **D**.

[3]

c A sample of the salt obtained was dissolved in distilled water and tested by adding barium chloride solution. A white precipitate was formed. What was the name of the acid that the student used in step **A**?

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

d In a second test, aqueous ammonia was added to a solution of the salt, first slowly and then in excess. What observations were made?

.....

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

[Total = 8]

6 A sample of air was taken in the middle of a city. The air was analysed and the gases listed below were found to be present.

carbon dioxide
carbon monoxide
methane
nitrogen
nitrogen dioxide
oxygen
sulfur dioxide

a Which gas would be present in the greatest quantity?

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

b Which two gases could cause acid rain?

.....and..... **[2]**

c Which two gases are most responsible for global warming?

.....and..... **[2]**

d Which gas is produced by plants in photosynthesis?

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

[Total = 6]

7 Metals can be extracted from their ores by heating with carbon or by electrolysis.

a Name a metal that is extracted from its ore by electrolysis.

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

b Copper can be extracted from copper oxide by heating it with carbon. Write a word equation for this reaction.

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

c Copper can be used to make alloys.

i What is an alloy? .....

.....

ii Name an alloy containing copper. ..... **[2]**

[Total = 5]

8 The graphs shown in Fig. 8.1 represent the motion of two cars, A and B.

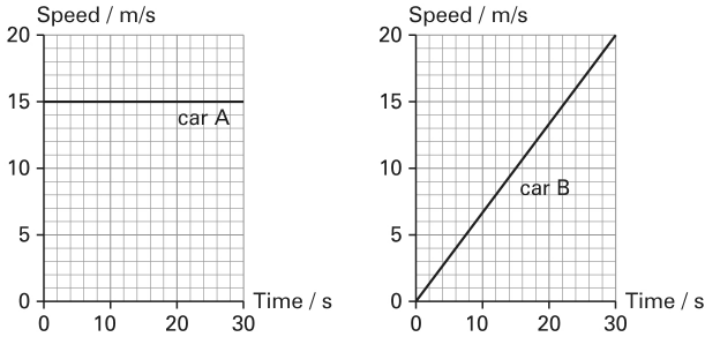


Fig. 8.1

a One of the graphs represent the motion of a car moving with constant speed.

i Which car is this, A or B? ..... **[1]**

ii Explain how you can tell.

.....

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

b Calculate the distance travelled in 30 s by car A.

distance travelled = ... m **[2]**

[Total = 5]

9 Fig. 9.1 shows a car as it travels to the top of a hill and stops.

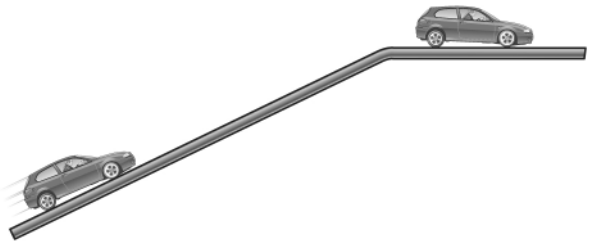


Fig. 9.1

a Which form of energy has increased when the car stops at the top of the hill?
Tick the box.

kinetic energy ☐

gravitational potential energy ☐ **[1]**

b Which form of energy has decreased when the car stops at the top of the hill?
Tick the box.

kinetic energy ☐

gravitational potential energy ☐ **[1]**

c The car uses petrol (gasoline) as its fuel. State the form of energy stored by the fuel. ..... **[1]**

[Total = 3]

10 Two mirrors, A and B, are arranged at an angle to one another. A ray of light is directed onto mirror A so that it is reflected towards mirror, as shown in Fig. 10.1.

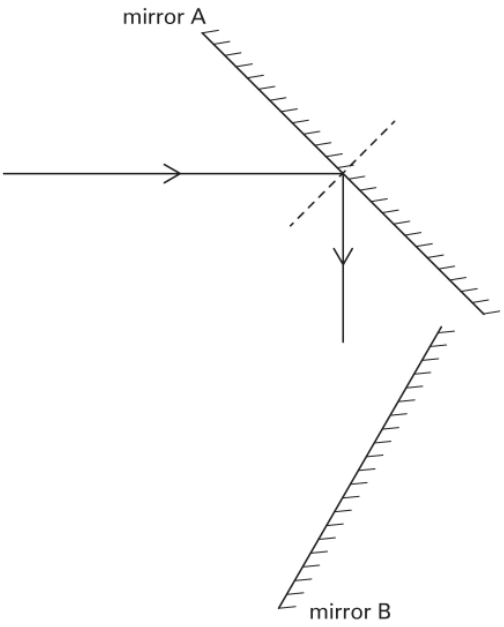


Fig. 10.1

a On Fig. 10.1, mark the angle of incidence *i* and the angle of reflection *r*. **[2]**

b Write the equation which relates angle *i* and angle *r*.

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

c On Fig. 10.1, using a ruler, draw the rest of the ray to show how it will be reflected by mirror B. **[1]**

[Total = 4]

11 Fig. 11.1 is a ray diagram which shows how an image can be formed by a thin converging lens. The object is represented by the arrow labelled O.

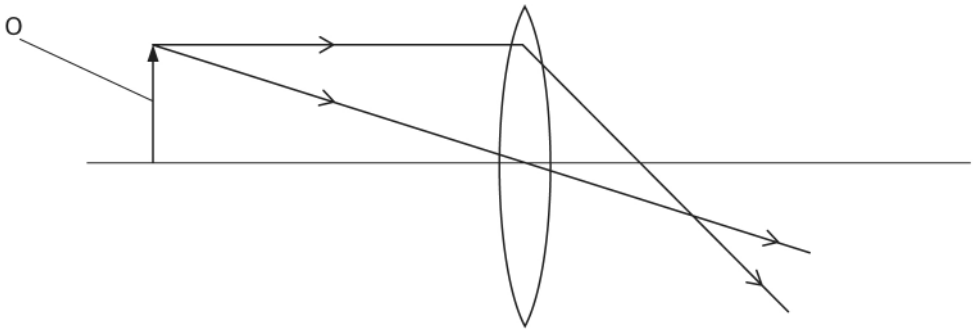


Fig. 11.1

a On Fig. 11.1, mark with an F the principal focus of the lens. **[1]**

b On Fig. 11.1, show where the image of the object will be formed. **[2]**

c State whether the image is:

enlarged / same size / diminished .....

upright / inverted ..... **[2]**

[Total = 5]

12 Three bar magnets are arranged as shown in Fig. 12.1.

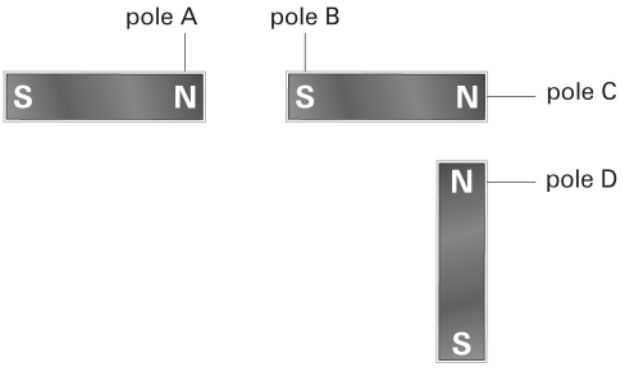


Fig. 12.1

a On the diagram, add an arrow to show the force of pole B on pole A. **[1]**

b On the diagram, add an arrow to show the force of pole D on pole C. **[1]**

c Explain why a bar magnet should be made of steel rather than soft iron.

.....

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

[Total = 4]

13 In the circuit shown in Fig. 13.1, an ammeter is being used to measure the current in a resistor.

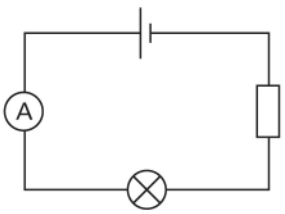


Fig. 13.1

a On Fig. 13.1, label the resistor with an R. **[1]**

b Add to Fig. 13.1 to show how you would include a voltmeter in the circuit to measure the potential difference across the resistor.

.....

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

c The ammeter reads 0.25 A. The potential difference across the resistor is 4.0 V.
Calculate the resistance of the resistor.

.....

.....

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

[Total = 6]