

**GENERAL CERTIFICATE OF SECONDARY EDUCATION  
GATEWAY SCIENCE  
ADDITIONAL SCIENCE B**

**B624/01**

Unit 2 Modules B4 C4 P4 (Foundation Tier)

**WEDNESDAY 23 JANUARY 2008**

Afternoon  
Time: 1 hour

Candidates answer on the question paper.

**Additional materials (enclosed):**

None

Calculators may be used.

**Additional materials:** Pencil  
Ruler (cm/mm)



Candidate  
Forename

Candidate  
Surname

Centre  
Number

--	--	--	--	--

Candidate  
Number

--	--	--	--

**INSTRUCTIONS TO CANDIDATES**

- Write your name in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use blue or black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- Do **not** write outside the box bordering each page.
- Write your answer to each question in the space provided.

**INFORMATION FOR CANDIDATES**

- The number of marks for each question is given in brackets [ ] at the end of each question or part question.
- The total number of marks for this paper is **60**.
- A list of physics equations is printed on page two.
- The Periodic Table is printed on the back page.

**FOR EXAMINER'S USE**

Section	Max.	Mark
<b>A</b>	<b>20</b>	
<b>B</b>	<b>20</b>	
<b>C</b>	<b>20</b>	
<b>TOTAL</b>	<b>60</b>	

This document consists of **22** printed pages and **2** blank pages.

## 2

### EQUATIONS

$$\text{speed} = \frac{\text{distance}}{\text{time taken}}$$

$$\text{acceleration} = \frac{\text{change in speed}}{\text{time taken}}$$

$$\text{force} = \text{mass} \times \text{acceleration}$$

$$\text{work done} = \text{force} \times \text{distance}$$

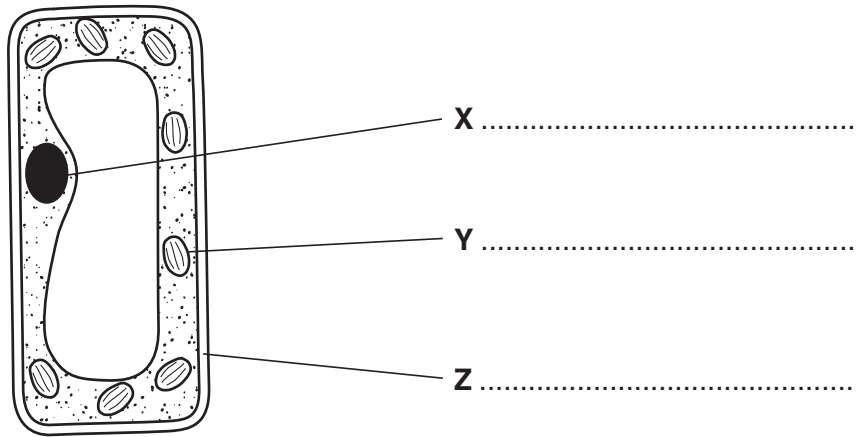
$$\text{power} = \frac{\text{work done}}{\text{time}}$$

$$\text{resistance} = \frac{\text{voltage}}{\text{current}}$$

Answer **all** the questions.

**Section A – Module B4**

1 The diagram shows a plant cell.



What are the names of parts **X**, **Y** and **Z**?

Write your answers on the diagram.

Choose your answers from the list below.

**cell membrane**

**cell wall**

**chloroplast**

**cytoplasm**

**nucleus**

**vacuole**

[3]

[Total: 3]

2 Dale grows tomatoes.

Greenflies sometimes damage his tomato plants.

(a) One way to control the greenflies is to use chemicals.

What type of chemical should Dale use to control greenflies?

Put a ring around the chemical that he should use.

**fungicide                      herbicide                      insecticide**

[1]

(b) Another way of controlling greenflies is to use **biological control**.

What is biological control?

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

(c) Dale does **not** grow his tomatoes in soil.

Instead he uses water to supply them with minerals.

What is this called?

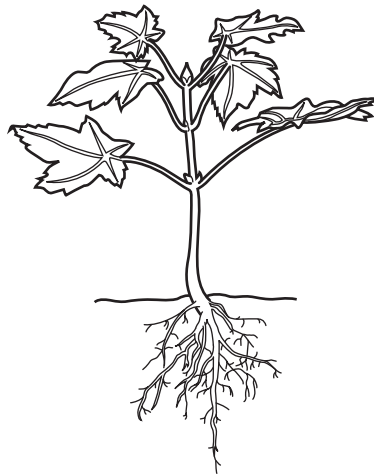
..... [1]

(d) Which part of Dale's tomato plants takes in the minerals?

..... [1]

[Total: 4]

3 The diagram shows a plant.



(a) Write about how **water** moves through a plant.

In your answer include

- where water enters a plant
- where water leaves a plant
- the processes involved.

.....

.....

.....

.....

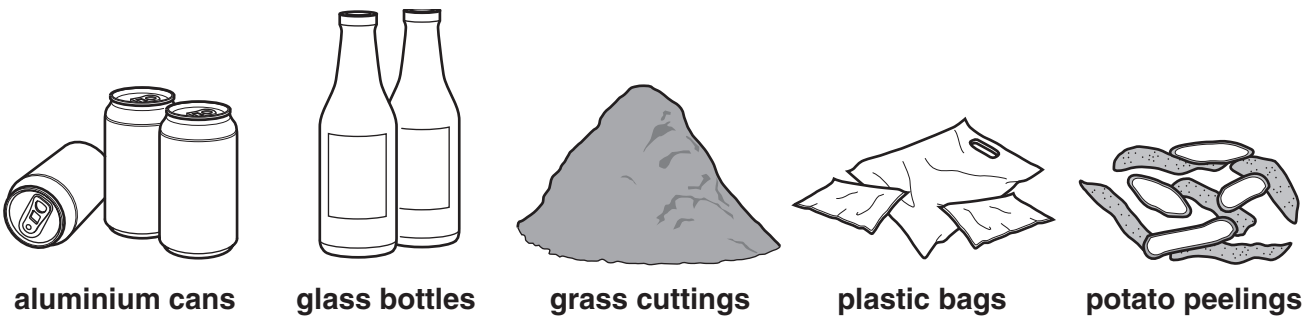
..... [3]

(b) In which part of a plant does most photosynthesis occur?

..... [1]

[Total: 4]

4 Look at the diagram. It shows some different types of household waste.



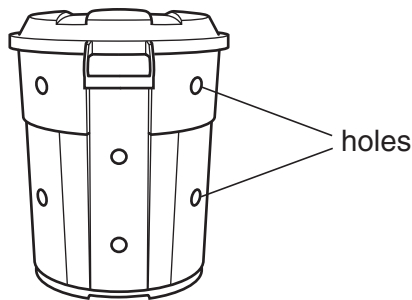
(a) Grass cuttings can **decay**.

Write down **one other** type of household waste that can decay.

Choose your answer from the diagram above.

..... [1]

(b) Bob puts his grass cuttings into a compost bin.



(i) The holes help the grass cuttings to decay.

Suggest how.

..... [1]

(ii) Grass cuttings decay faster in the summer than in the winter.

Suggest why.

..... [1]

(c) When grass cuttings decay, carbon dioxide is made.

What makes this carbon dioxide?

..... [1]

[Total: 4]

5 Look at the information about a farmland food chain.

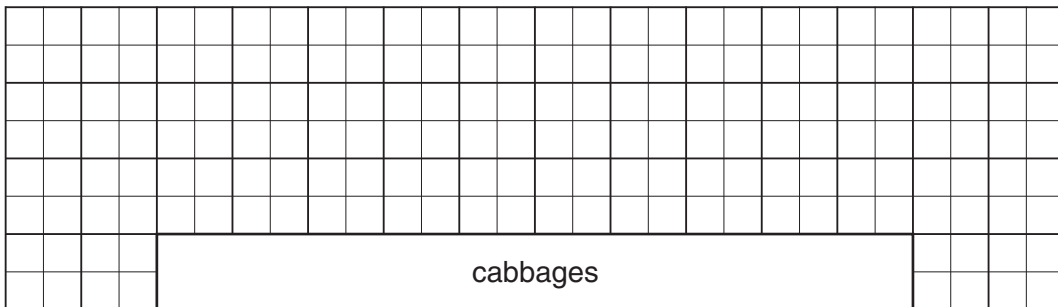
	number of individuals	mass of an individual in g	total biomass in g
cabbages	8	250	.....
caterpillars	400	2	800
thrushes	5	80	400
hawks	.....	200	200

(a) (i) Complete the table. [2]

(ii) Use the data in the table to complete the pyramid of **biomass**.

- Use 1 cm square = 200 g.
- Label the pyramid.

The bar for cabbages has been done for you.



[2]

(b) Some plant biomass can be used for fuel.

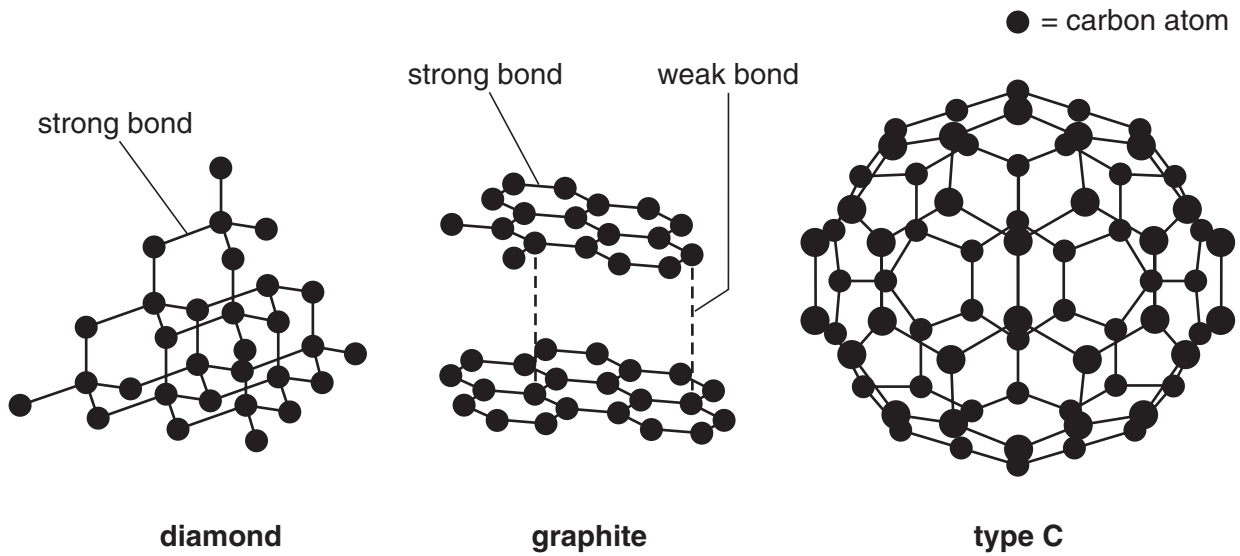
Write down **one** example of a fuel from plant biomass.

..... [1]

[Total: 5]

Section B – Module C4

6 Look at the diagrams. They show the different forms of carbon.



(a) What is the name of type C?

..... [1]

(b) What does diamond look like?

Your answer should include

- the appearance of diamond
- its colour.

..... [2]

(c) Write down **one** use of diamond.

..... [1]

[Total: 4]



7 This question is about detergents.

Look at the label from a packet of washing powder.

<p style="text-align: center;"><b>Active ingredients</b></p> <p>detergent water softener bleach optical brighteners enzymes</p>
---

(a) One ingredient is the main cleaning agent.

Which one?

Choose from the list of ingredients.

..... [1]

(b) One ingredient gives the 'whiter than white' appearance to the clothes.

Which one?

Choose from the list of ingredients.

..... [1]

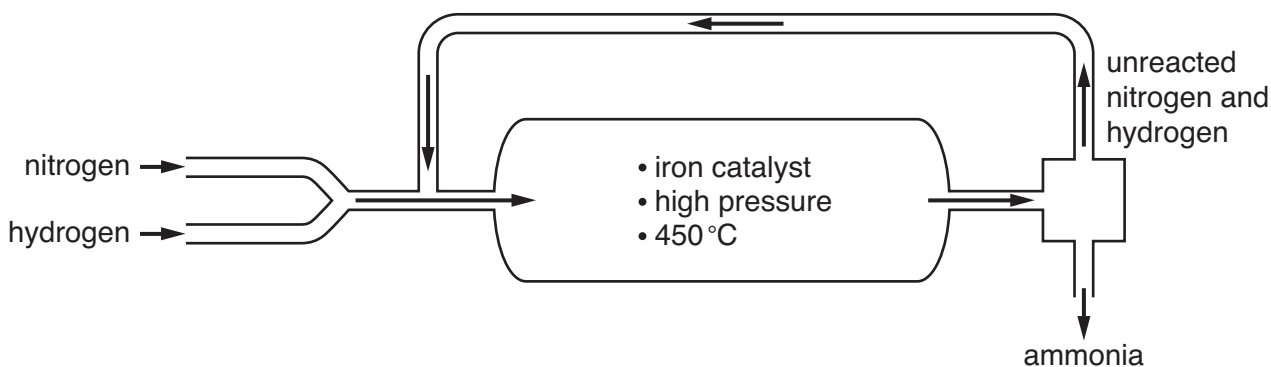
(c) Some washing powders are designed to work at low temperatures.

Write down an **advantage** of washing clothes at lower temperatures.

..... [1]

[Total: 3]

8 Ammonia is made from nitrogen and hydrogen in the Haber process.



The equation for the reaction is



(a) Hydrogen is needed for the process.

Where does the hydrogen come from?

Choose from the list.

**air**

**carbon dioxide**

**natural gas**

answer ..... [1]

(b) What does the symbol  $\rightleftharpoons$  mean?

..... [1]

(c) Some of the nitrogen and hydrogen does not react.

What happens to the unreacted nitrogen and hydrogen?

..... [1]

(d) There are lots of costs in making ammonia. One is the cost of the equipment used.

Write about **other** costs in making ammonia.

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

(e) Factories which make ammonia run for 24 hours a day for 7 days a week.

What is the name given to this type of process?

Choose from the list.

**batch**

**continuous**

**purification**

**neutralisation**

answer ..... [1]

[Total: 6]

9 This question is about fertilisers.



(a) Many fertilisers contain three essential elements.

Complete these statements. One has been done for you.

You should use the Periodic Table on the back page to help you.

N is nitrogen.

P is .....

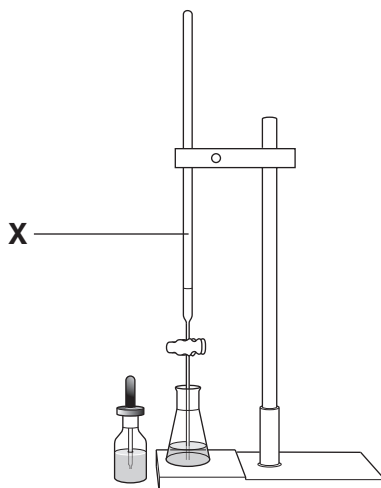
K is .....

[2]

(b) Why do farmers use fertilisers?

..... [1]

(c) Fertilisers can be made by adding an alkali to an acid.



Look at the apparatus that is used.

Write down the name of the piece of apparatus labelled X.

Choose from the list.

**burette**

**filter funnel**

**measuring cylinder**

**pipette**

answer ..... [1]

(d) Ammonium nitrate is a fertiliser. The formula for ammonium nitrate is  $\text{NH}_4\text{NO}_3$ .

Calculate the relative formula mass ( $M_r$ ) of ammonium nitrate.

The relative atomic mass ( $A_r$ ) for N is 14, for H is 1 and for O is 16.

.....

.....

.....

answer ..... [1]

(e) Ryan makes some ammonium nitrate.

He predicts that he will make 25 g. His actual yield is 20 g.

Calculate his percentage yield.

.....  
.....  
.....

percentage yield = ..... % [2]

[Total: 7]

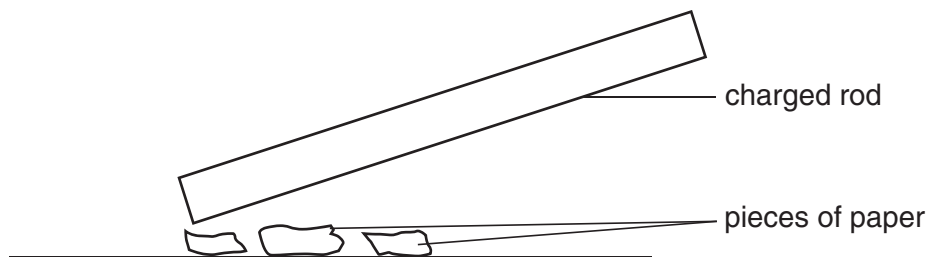
Section C – Module P4

10 (a) Yvonne rubs a plastic rod with a duster.

It becomes charged.

She puts it near some small pieces of paper.

Look at the diagram.



(i) What will happen to the small pieces of paper?

..... [1]

(ii) There are two sorts of charge.

Write down the names of the two sorts of charge.

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

(iii) We can get an electric shock from electrostatic charges.

Describe how.

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

(b) Static electricity can be useful.

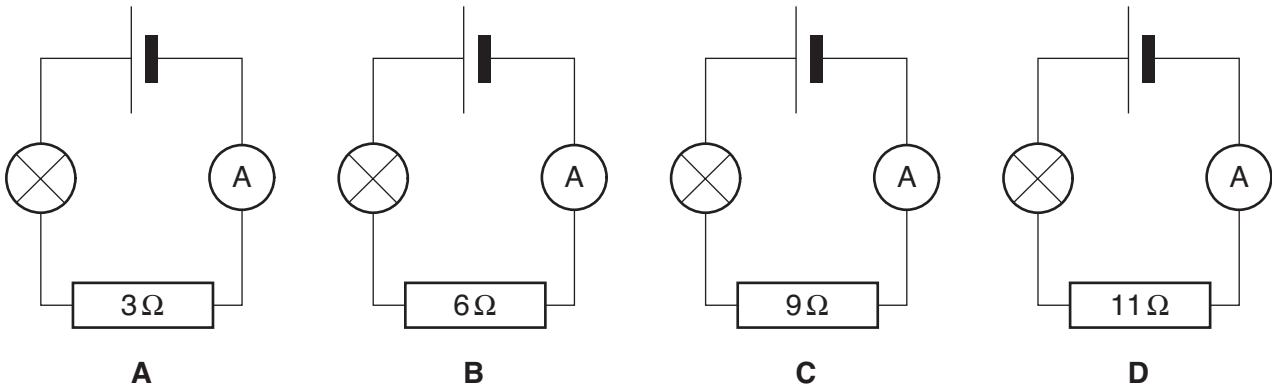
Write down **one** use of static electricity.

..... [1]

[Total: 5]

11 (a) This question is about electric circuits.

Look at the electric circuits.



The lamp and battery are the same in all the circuits.

(i) Which circuit has the smallest current?

Choose from: **A B C D**

answer .....

[1]

(ii) Which circuit has the largest current?

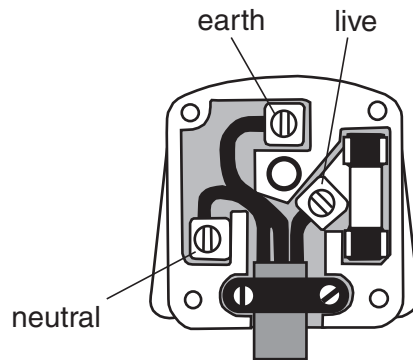
Choose from: **A B C D**

answer .....

[1]



(b) Look at the diagram of a mains plug.



The columns below list the three terminals of a plug and the colours of the wires.

(i) Draw a straight line from **each** terminal to its correct wire colour.

terminal	colour
earth	blue
live	brown
neutral	green/yellow

[2]

(ii) Some appliances are **double insulated**.

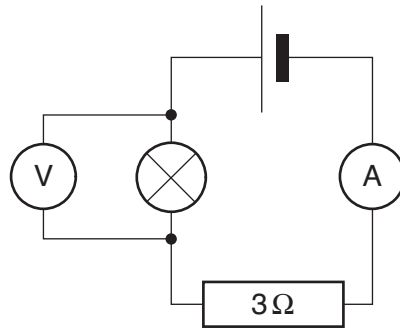
They only have two wires connected to the plug.

Which wire is **not** needed for a double insulated appliance?

..... [1]

(c) Yvonne puts a voltmeter across a lamp.

Look at the diagram.



The reading on the voltmeter is 5V.

The reading on the ammeter is 2A.

Calculate the resistance of the lamp.

Use the equations on page 2 to help you.

.....  
.....

answer .....ohms

[2]

[Total: 7]

12 There are three types of nuclear radiation.

Alpha and gamma are two of the types.

(a) Write down the name of the third type of nuclear radiation.

..... [1]

(b) Gamma radiation is an electromagnetic wave.

**Another** type of electromagnetic wave has a similar wavelength.

It is used in medicine.

What is it called?

..... [1]

(c) Write down **one** other use of gamma radiation.

..... [1]

[Total: 3]

13 (a) Nuclear radiation is always present in the environment.

(i) What do we call this nuclear radiation?

..... [1]

(ii) Some of this radiation comes from atoms in rocks.

Which part of the atom gives out the radiation?

..... [1]

(b) Electricity is generated in a nuclear power station.

(i) Write down the **name** of the fuel used in a nuclear power station.

..... [1]

(ii) There are three main stages in the production of electricity in a power station.

Complete the diagram.



[2]

[Total: 5]

**END OF QUESTION PAPER**

21  
BLANK PAGE

PLEASE DO NOT WRITE ON THIS PAGE

**PLEASE DO NOT WRITE ON THIS PAGE**

**PLEASE DO NOT WRITE ON THIS PAGE**

---

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (OCR) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

OCR is part of the Cambridge Assessment Group. Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.

