



BOARD OF STUDIES  
NEW SOUTH WALES

**1999  
SCHOOL  
CERTIFICATE  
TEST**

**8 November**

**SCIENCE**

**SECTION 2**

**CENTRE NUMBER**

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**STUDENT NUMBER**

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## Directions for Section 2

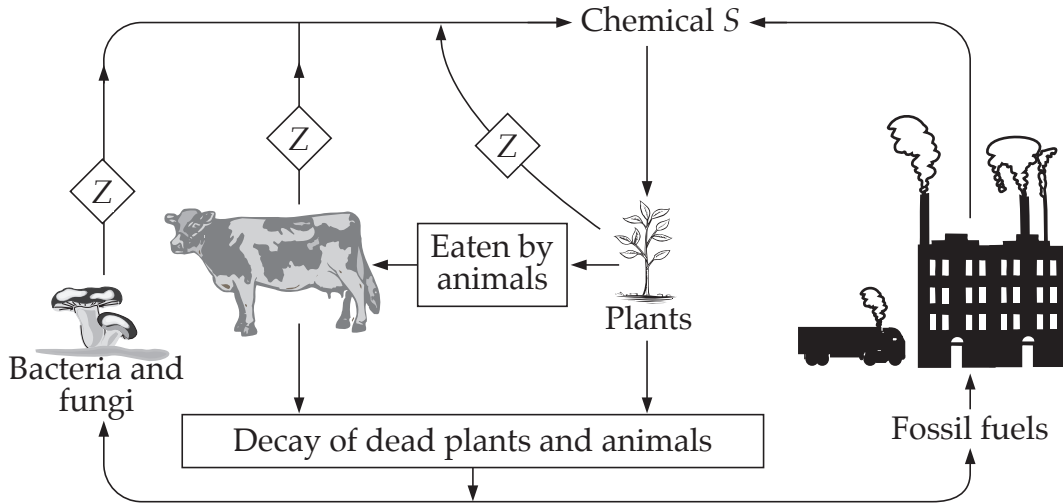
- 1 Allow about 45 minutes to answer this section
- 2 This section has THREE parts

Part C	Questions 26–27	(8 marks)
Part D	Question 28	(8 marks)
Part E	Questions 29–30	(9 marks)
- 3 Complete your answers to Section 2 on the lines provided on pages 18 to 28
- 4 Write your Centre Number and Student Number at the top of this page AND at the top of pages 21 and 25

PART C

Question 26 (5 marks)

The diagram shows a cycle in nature.



(a) What natural cycle does this diagram represent?

.....

(b) What is chemical S?

.....

(c) What name is given to chemical process Z?

.....

(d) State and explain ONE effect long-term logging will have on the atmosphere.

Effect .....

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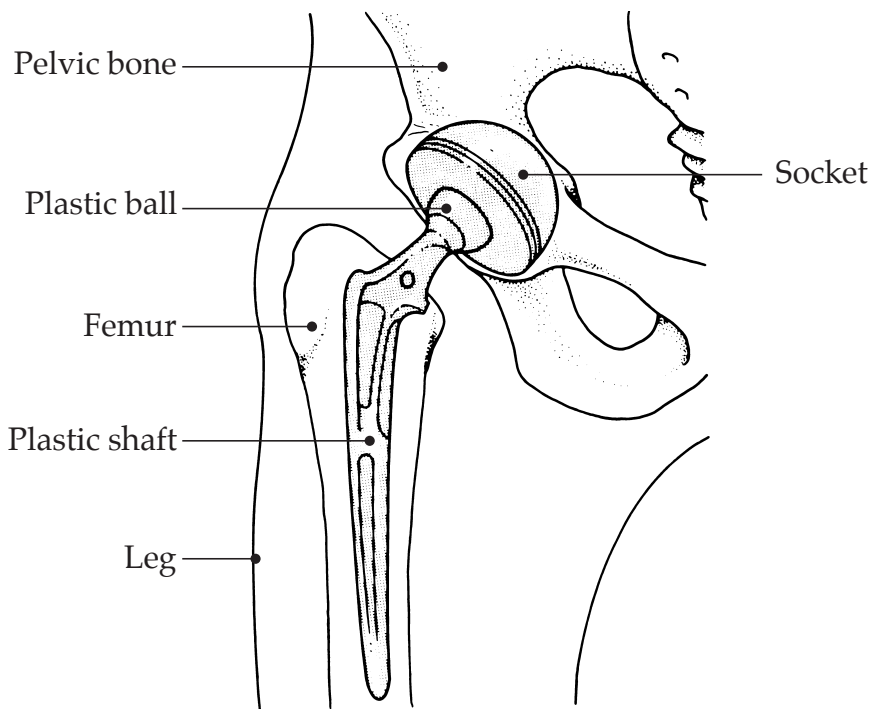


Explanation .....

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**Question 27** (3 marks)

People with arthritis often have a *hip replacement* that allows them to move more easily. The replacement joint is often made from high density plastic. The shaft is cemented into the femur. The ball fits into a socket which is screwed into the hollow of the pelvic bone.



(a) Complete the following table.

<i>Property of plastic</i>	<i>Why this makes it suitable for use in a replacement joint</i>
Strong	This joint is subjected to large forces.
(i) .....	(ii) .....
.....	.....

(b) After a hip replacement operation, patients are put on a high calcium diet. Suggest why this is essential for the long-term success of the hip replacement.

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**End of Section 2 Part C**

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**PART D**

- Write your Centre Number and Student Number at the top of this page
- Complete your answers in this booklet

**Please turn over**

**Question 28** (8 marks)

Some students were given a large container of hot water and three identical cans, except that one was painted white, one blue and one black.

They were asked to design and conduct an experiment to see how the colour of the can affected the rate at which water it contained cooled down.

(a) The table shows one student’s equipment list.

Complete the last row of the table to show the other piece of equipment needed to collect results for the experiment and its reason for use.

<i>Equipment</i>	<i>Reason for use</i>
• Cans	• To hold hot water
• Beaker	• To measure volume of water
• Large container	• To store hot water
• Stopwatch	• To measure time
•	•

(b) One of the pieces of equipment used in the student’s experiment should have been replaced by a different piece.

(i) Which piece should be replaced and what should it be replaced by?

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 .....

(ii) Explain your answer.

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 .....

(c) Except for colour, the cans are identical. Name ONE other factor that would need to be controlled in this experiment.

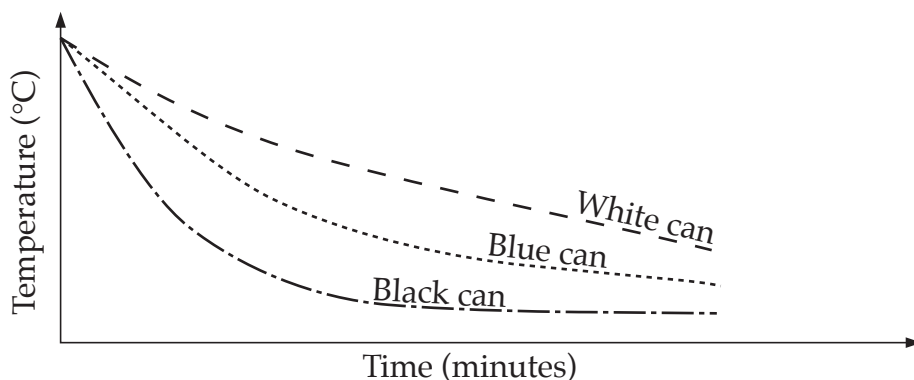
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(d) Name the variable being tested.

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Question 28 (Continued)

(e) The graph shows the results of the student's experiment.



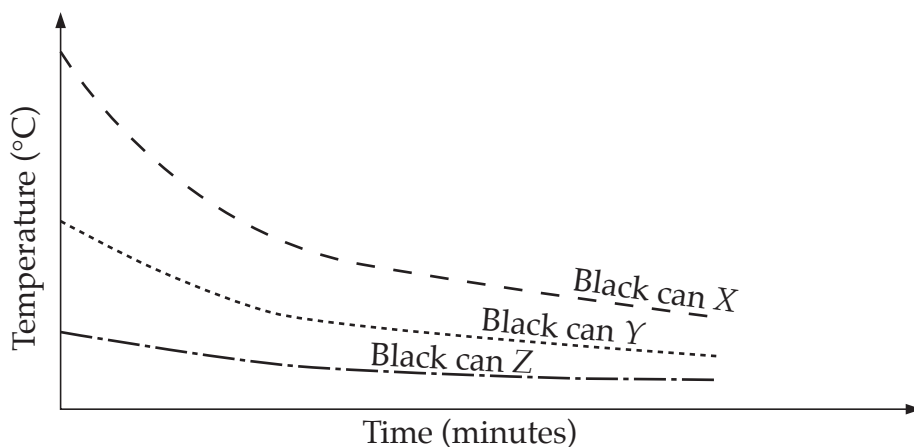
Write a conclusion for the experiment.

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(f) The experiment was repeated using three identical black cans X, Y and Z.



(i) What was the aim of the experiment?

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.....

(ii) What do these results show?

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**End of Section 2 Part D**

**Go on to Part E**

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**PART E**

- Write your Centre Number and Student Number at the top of this page
- Complete your answers in this booklet

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**Question 29** (5 marks)

The information in the table below and the incomplete flowchart on page 27 relate to six chemicals (A–F) found in a farm shed.

<i>Chemical</i>	<i>Substance</i>	<i>Description</i>
<i>A</i>	Fertiliser	<ul style="list-style-type: none"> <li>• white solid</li> <li>• dissolves in water</li> <li>• reacts with sodium hydroxide</li> </ul>
<i>B</i>	Snail bait	<ul style="list-style-type: none"> <li>• blue solid</li> <li>• dissolves in water</li> <li>• reacts with sodium hydroxide</li> </ul>
<i>C</i>	Methylated spirits	<ul style="list-style-type: none"> <li>• clear liquid</li> <li>• dissolves in water</li> <li>• does not react with sodium hydroxide</li> </ul>
<i>D</i>	Petrol	<ul style="list-style-type: none"> <li>• yellowy liquid</li> <li>• does not dissolve in water</li> <li>• does not react with sodium hydroxide</li> </ul>
<i>E</i>	Acid	<ul style="list-style-type: none"> <li>• clear liquid</li> <li>• dissolves in water</li> <li>• reacts with sodium hydroxide</li> </ul>
<i>F</i>	Washing soda	<ul style="list-style-type: none"> <li>• white solid</li> <li>• dissolves in water</li> <li>• does not react with sodium hydroxide</li> </ul>

- (a) According to the information in the table, what chemical would you use to distinguish between methylated spirits and acid?

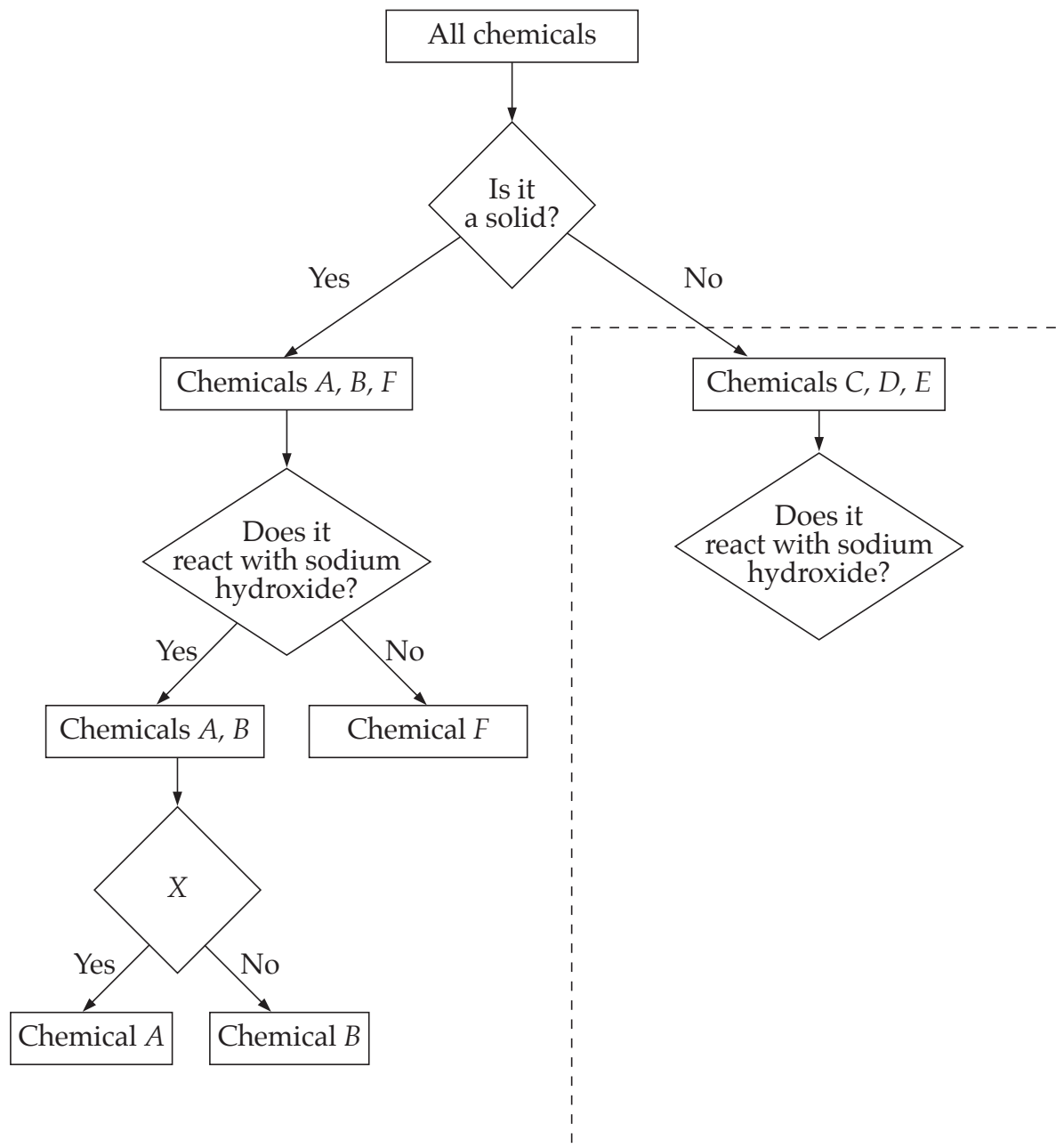
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- (b) What question should be asked in  on the flowchart on page 27?

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Question 29 (Continued)

- (c) Complete the flowchart below to identify chemicals *C*, *D* and *E*, by drawing and writing appropriate information inside the space indicated on the diagram.

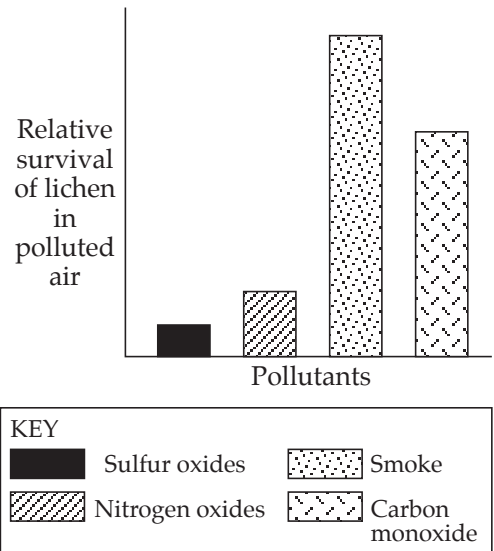


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**Question 30** (4 marks)

The table and graph show some information about air pollution.

Pollutants	SOURCE OF POLLUTANTS		
	Power stations (%)	Road traffic (%)	Other sources (%)
Sulfur oxides	70	2	28
Nitrogen oxides	30	50	20
Smoke	25	25	50
Carbon monoxide	1	90	9

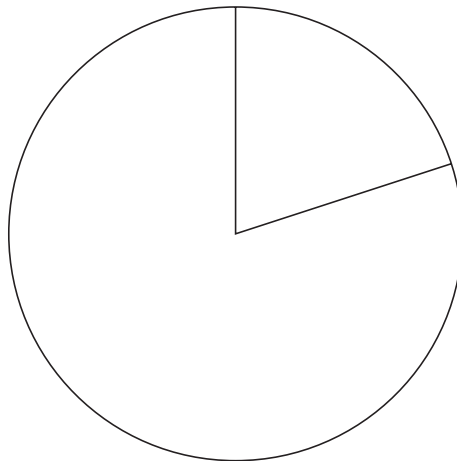


- (a) Half of all smoke pollution comes from sources other than power stations and road traffic. Name ONE other major source of smoke pollution.

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- (b) Use data from the table to complete the sector (pie) graph for the percentage of nitrogen oxides produced by each source.

Label each sector of the graph.



- (c) Lichens are organisms that grow on rocks, trees and buildings. Very few lichens live near power stations, but they are often found alongside roads. Suggest the MAIN reason for this low occurrence near power stations.

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