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NZQA
NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

For Supervisor's use only

Level 1 Chemistry, 2008

90648 Describe properties and reactions of carbon and its compounds

Credits: Three
9.30 am Friday 28 November 2008

Check that the National Student Number (NSN) on your admission slip is the same as the number at the top of this page.

You should answer ALL the questions in this booklet.

If you need more space for any answer, use the page(s) provided at the back of this booklet and clearly number the question.

Check that this booklet has pages 2–7 in the correct order and that none of these pages is blank.

YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

For Assessor's use only	**Achievement Criteria**	
Achievement	**Achievement with Merit**	**Achievement with Excellence**
Describe properties and reactions of carbon and its compounds. ☐	Link properties and reactions of carbon and its compounds. ☐	Apply an understanding of properties and reactions of carbon and its compounds. ☐
Overall Level of Performance ☐		

You are advised to spend 30 minutes answering the questions in this booklet.

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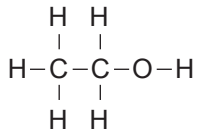
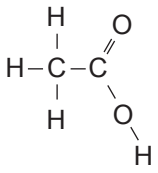
QUESTION ONE: ORGANIC COMPOUNDS

(a) Complete the following table by naming or drawing the structural formulae of the compounds as required.

Structure	Name
(i)	hexane
(ii)	ethene
	(iii)
	(iv)

(b) Name the process that uses glucose to produce the compound in (iii) above.

_____

(c) Identify the compound(s) above that would be soluble in water.

_____

(d) Propane and ethanol are organic compounds used as fuel.

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Propane burns with an orange flame and some soot forms.
Ethanol burns with an almost invisible flame with no soot forming.

By considering the products of these reactions, predict and justify which fuel will have the larger impact on people.
Include examples of how people would be affected, and an appropriate balanced equation for each fuel.

QUESTION TWO: CARBON DIOXIDE IN THE CARBON CYCLE

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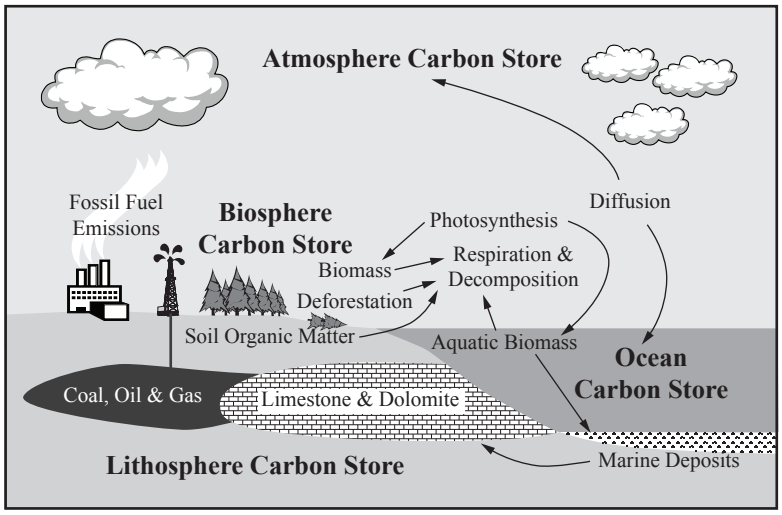

Ocean carbon stores remove some of the carbon dioxide that is added to the atmosphere.

Discuss the role of the ocean stores in maintaining carbon dioxide levels in the atmosphere. Include in your answer:

- why cold water in the Antarctic absorbs carbon dioxide
- why warm water in the tropics tends to release carbon dioxide
- a balanced equation for the reaction of carbon dioxide with water
- a prediction of the impact on the environment if the ocean carbon store could not carry out this role.

QUESTION THREE: ALLOTROPES OF CARBON

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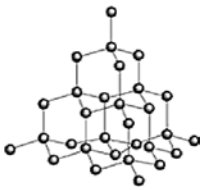
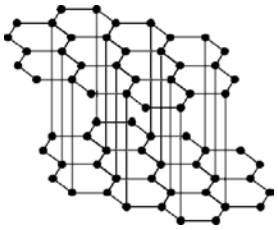
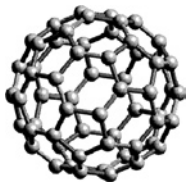
The structures of three allotropes of carbon are shown below.



A



B



C

Allotrope **C** has a melting point of 400–500°C, which is significantly lower than those for allotropes **A** and **B**, whose melting points are over 3000°C.

Identify each of the allotropes:

A _____ **B** _____ **C** _____

Discuss why the melting point for allotrope **C** is lower than the melting point for allotropes **A** and **B**. In your answer refer to the structures of **EACH** allotrope.

QUESTION FOUR: FRACTIONAL DISTILLATION

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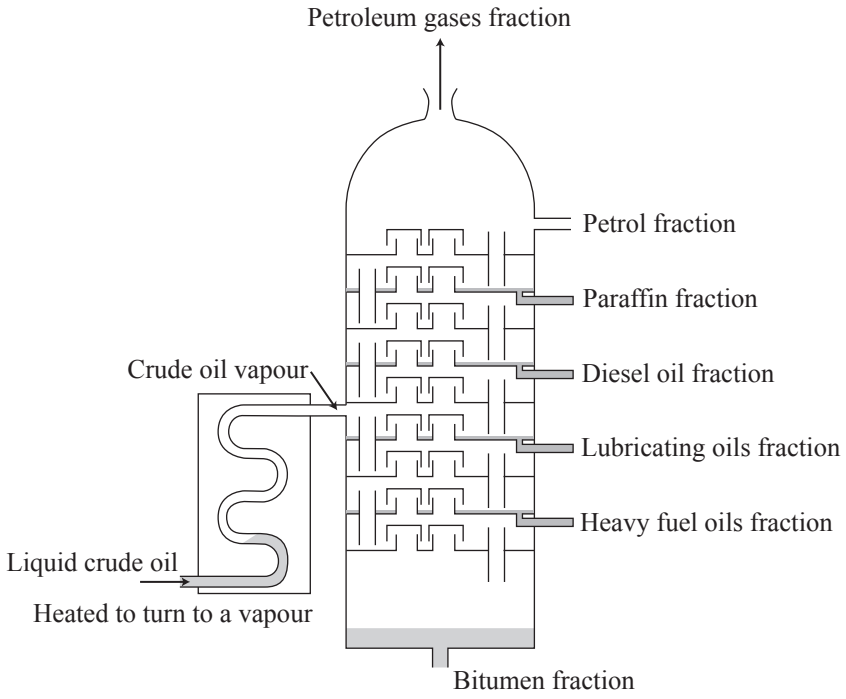
The following diagram illustrates the process of fractional distillation.

Fractional distillation tower



Discuss how crude oil can be separated into its components using fractional distillation.

In your answer, outline what crude oil is and refer to the physical properties of hydrocarbons.

Extra paper for continuation of answers if required.
Clearly number the question.

Assessor's use only

Question number