Surname	Initial(s)
Signature	

Paper Reference(s)

5008

Edexcel GCSE

Science

Chemistry C1b

Topic 7: There's One Earth

Topic 8: Designer Products

Foundation and Higher Tiers

Thursday 9 November 2006 – Morning

Time: 20 minutes

Materials required for examination
Multiple Choice Answer Sheet
HB pencil, eraser and calculator

Items included with question papers
Nil

Instructions to Candidates

Use an HB pencil. Do not open this booklet until you are told to do so.
Mark your answers on the separate answer sheet.

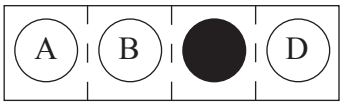
Foundation-tier candidates: answer questions 1 – 24.
Higher-tier candidates: answer questions 17 – 40.
All candidates are to answer questions 17 – 24.

Before the test begins:

Check that the answer sheet is for the correct test and that it contains your candidate details.

How to answer the test:

For each question, choose the right answer, A, B, C or D and mark it in HB pencil on the answer sheet.
For example, the answer C would be marked as shown.



Mark only **one** answer for each question. If you change your mind about an answer, rub out the first mark **thoroughly**, then mark your new answer.

Do any necessary calculations and rough work in this booklet. You may use a calculator if you wish.

You must not take this booklet or the answer sheet out of the examination room.

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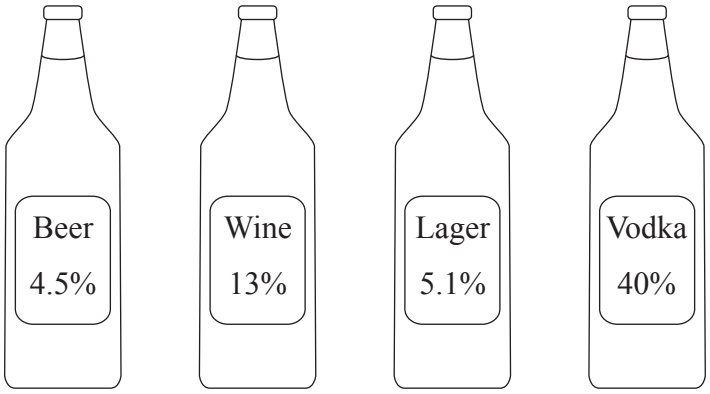
Questions 1 to 16 must be answered by Foundation-tier candidates only.
Higher-tier candidates start at question 17.

Alcoholic drinks

1. The amount of ethanol in different alcoholic drinks varies considerably.
The diagram shows four bottles, each containing 500 cm^3 of a different alcoholic drink.
The label shows the percentage of ethanol in each drink.



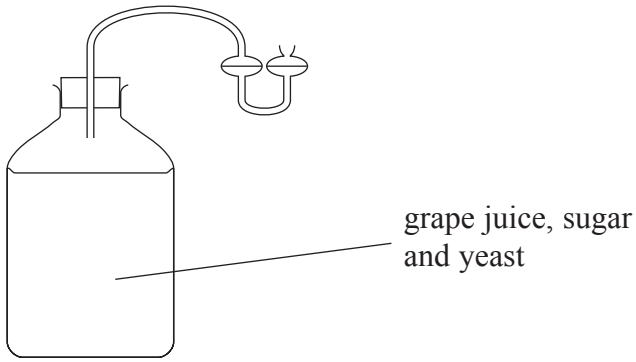
Which bottle contains the smallest amount of ethanol?

2. Which of the drinks listed below is likely to have the largest effect on a person's ability to walk in a straight line?

A 100 cm^3 of beer
B 100 cm^3 of lemonade
C 100 cm^3 of wine
D 100 cm^3 of spirit e.g. vodka

Use the following information to answer questions 3 and 4.

Ethanol can be produced using this apparatus.



3. The process shown is

A distillation
B evaporation
C combustion
D fermentation

4. The best temperature for this process is

A –30 °C
B 0 °C
C 30 °C
D 100 °C

5. Car drivers who may have been consuming alcoholic drinks can be breathalysed to find the concentration of ethanol in their blood.
A high level of ethanol results in

A slower reactions
B clearer vision
C faster reactions
D safer driving

Fuels for cars

There is a need to reduce the use of fossil fuels.

Some cars use hydrogen as their fuel.

6. Which of the following can result from burning fossil fuels?

A desalination
B wind farms
C nuclear power stations
D global warming

7. A good fuel is one that produces

A soot
B no pollution
C ash
D toxic gases

8. Petrol is a fuel containing hydrocarbons.
The complete combustion of petrol produces

A water only
B carbon dioxide only
C carbon dioxide and water
D carbon monoxide and water

Use the information below to answer questions 9, 10 and 11.

Two other fuels that can be used in cars are E85 and hydrogen.

- E85 is a fuel containing 85% alcohol and 15% petrol
- hydrogen is obtained from water or methane

9. An advantage of using alcohol made from sugar as a fuel, instead of petrol, is that it

A is a bio-fuel
B produces sulphur dioxide when burnt
C is obtained from a non-renewable source
D reduces the need to grow sugar crops

10. Using E85 rather than petrol as a car fuel is better for the environment because

A alcohol does not produce carbon dioxide when burnt
B petrol does not produce carbon dioxide when burnt
C alcohol can be made from plants and plants remove carbon dioxide from the atmosphere
D petrol is a renewable fuel

11. A disadvantage of using hydrogen as a fuel is

A it is unreactive
B pollutants are formed when it burns
C a lack of raw materials from which to make it
D an escape of the gas could result in an explosion

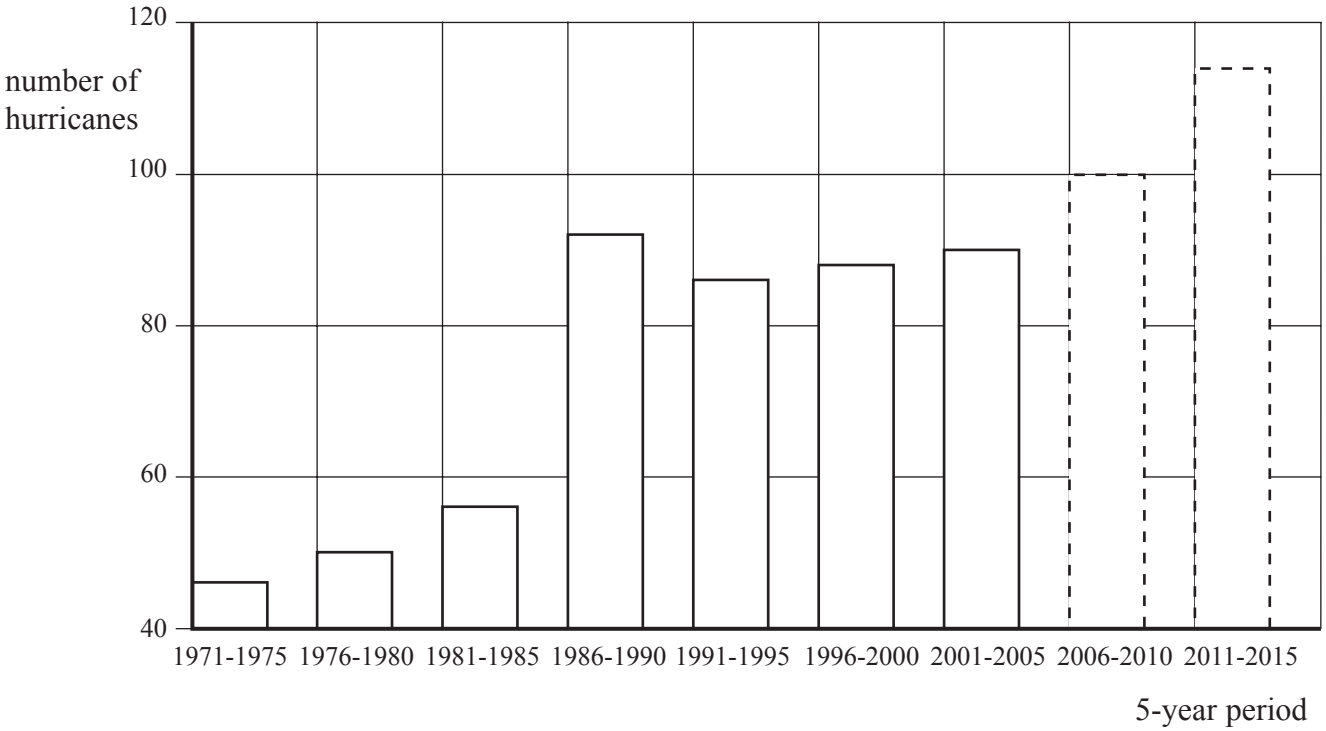
Greenhouse gases

A newspaper headline states

> **Change to our climate unstoppable, warns expert**

Use the following information to answer questions 12 and 13.

The bar chart shows the number of hurricanes in the USA, in five year periods from 1971 to 2005, and the predicted number from 2006 to 2015.
The dotted bars represent predicted numbers.



12. In which period did the highest number of hurricanes occur?

A 1971 to 1975
B 1981 to 1985
C 1986 to 1990
D 1991 to 1995

13. The number of hurricanes predicted from 2011 to 2015 is probably based on

A studying animal behaviour
B a computer model
C an experimental result
D changes in plants

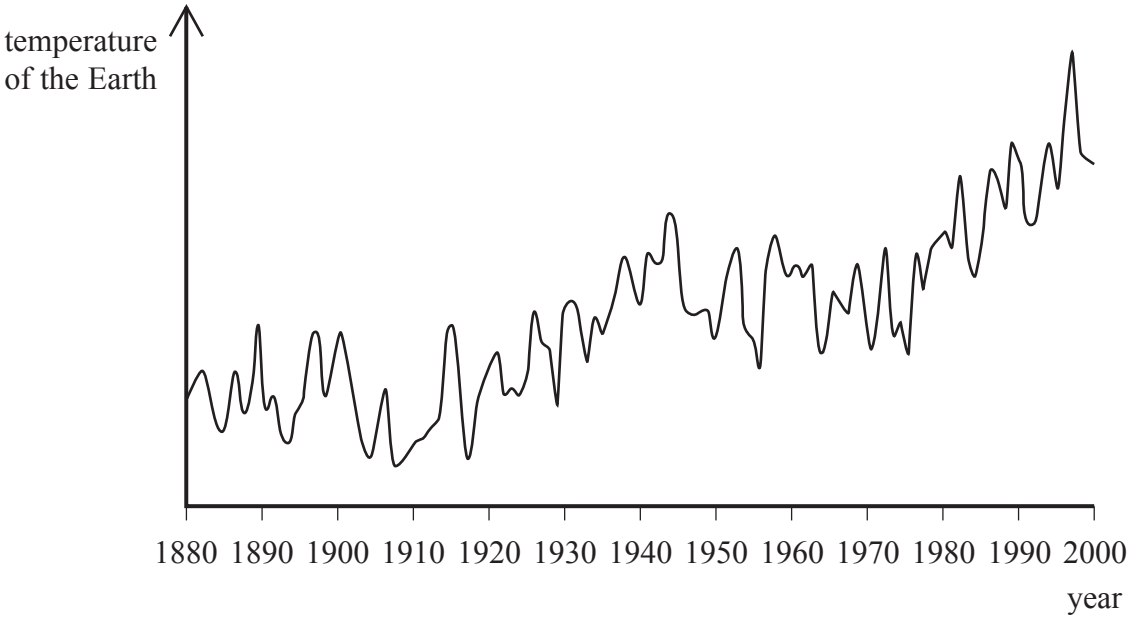
14. Greenhouse gases

A are less dense than air
B trap heat
C are denser than air
D allow heat to escape

15. A gas usually referred to as a greenhouse gas is

A oxygen
B nitrogen
C carbon dioxide
D helium

16. The graph shows how the temperature on Earth has varied from 1880 to 2000.



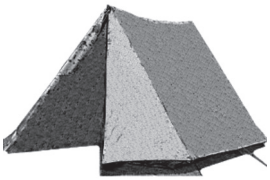
From 1880 to 2000 the temperature has

A increased every year
B shown an increasing trend
C decreased every year
D shown a decreasing trend

Higher-tier candidates start at question 17 and answer questions 17 to 40.
Questions 17 to 24 must be answered by all candidates: Foundation-tier and Higher-tier.

Camping

John and his family went camping.



17. Tent pegs can be made from aluminium or material containing carbon fibres.
The main advantage of using carbon fibre material is that it is

A heavy
B cheap
C very strong
D colourful

18. Tent poles are increasingly made from materials containing Kevlar.
An advantage of using these materials, instead of steel, is

A they are less attractive than steel
B they are more expensive than steel
C Kevlar is a natural material
D Kevlar has a low density but is strong

19. John used a Teflon-coated non-stick saucepan to cook the food.
This use of Teflon was

A discovered after Teflon was made
B to make the food cook slower
C to improve the flavour of the food
D to make the food cook quicker

Use the following information to answer questions 20 and 21.

John wore an anorak made of Gore-Tex. This anorak will keep him dry and allow any sweat to evaporate.
John's wife wore 'Greenclothes'. 'Greenclothes' are made from natural materials produced by environmentally friendly methods.

20. The Gore-Tex fabric

A is coated with a waterproof substance on the inside
B allows water molecules to enter the fabric but not escape
C allows air to enter the fabric but not escape
D stops water molecules from entering the fabric but allows them to escape

21. 'Greenclothes' are most likely to be made of

A Lycra
B cotton grown without using pesticides
C Thinsulate
D cotton grown using pesticides

Nitrogen in the atmosphere

22. The percentage of nitrogen in air since the Earth was formed has

A stayed the same
B increased
C doubled
D decreased

23. Liquid nitrogen is obtained from liquid air by

A fractional distillation
B chromatography
C evaporation
D combustion

24. Nitrogen, rather than air, is used as the gas in crisp packets because it

A improves the taste of the crisps
B is cheaper than air
C does not react with the crisps
D makes the packets attractive

TOTAL FOR FOUNDATION-TIER PAPER: 24 MARKS

Foundation-tier candidates do not answer any more questions after question 24.

Questions 25 to 40 must be answered by Higher-tier candidates only.
Foundation-tier candidates do not answer questions 25 to 40.

Poisonous gases in the home

Gas engineers regularly check gas boilers for efficiency and ventilation.

25. Carbon monoxide is formed from natural gas in gas boilers if there is

A complete combustion
B fractional distillation
C incomplete combustion
D a draught

26. Carbon monoxide is toxic to humans because it

A is absorbed through the skin
B is a pollutant
C combines with haemoglobin
D causes asthma

27. Which is the correct, balanced equation for the burning of methane in excess air?

A $CH_4 + O_2 \longrightarrow CO_2 + H_2O$
B $2CH_4 + 2O_2 \longrightarrow 2CO + 4H_2O$
C $2CH_4 + 3O_2 \longrightarrow 2CO + 2H_2O$
D $CH_4 + 2O_2 \longrightarrow CO_2 + 2H_2O$

28. Which poisonous gas, obtained from rock salt, is used in the manufacture of household bleaches?

A sodium
B chlorine
C sodium chloride
D hydrogen

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Crude oil

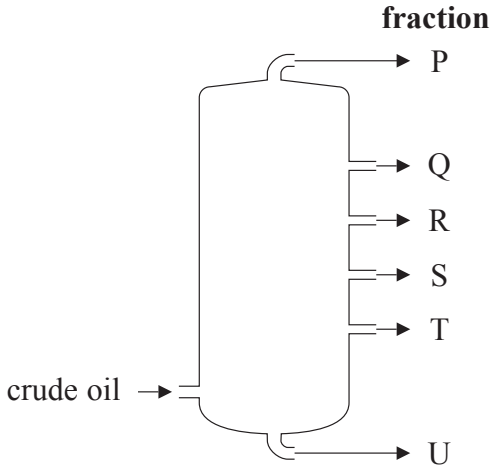
Many useful products are obtained by the fractional distillation of crude oil.

29. Which of the following statements about this process is correct?

A Each fraction contains a number of different hydrocarbons
B Fractions which ignite easily are collected from the bottom of the column
C Each fraction is a pure substance
D Fractions with the lowest boiling points are collected from the bottom of the column

Use the following information to answer questions 30 to 33.

The diagram shows a fractionating column used to distil crude oil.



30. Which row of the table correctly compares fraction R with fraction S?

	flammability of R	**average length of carbon chain in R**
A	less than S	longer than S
B	less than S	shorter than S
C	more than S	longer than S
D	more than S	shorter than S

31. Compare fractions Q and T.
Which row of the table correctly compares properties of fraction Q with those of fraction T?

	boiling point of Q	**viscosity of Q**
A	lower than T	less than T
B	lower than T	more than T
C	higher than T	less than T
D	higher than T	more than T

32. Which fraction is most likely to be used to waterproof shed roofs?

A P
B Q
C T
D U

33. Which fraction is most likely to be used as LPG fuel (liquefied petroleum gas)?

A P
B Q
C T
D U

Recycling

34. Which of these statements is **not** a correct reason for recycling aluminium?

A it allows resources to be saved
B it is cheaper to recycle than manufacture
C it allows waste to be reduced
D it is difficult to recycle

35. In hot countries fresh water is recycled from sea water.

Fresh water can be obtained from sea water containing suspended solids by

A	evaporation	filtration	condensation
B	filtration	evaporation	condensation
C	filtration	condensation	evaporation
D	evaporation	condensation	filtration

36. Recycling is an important part of sustainable development.

Sustainable development

A involves only developing countries
B involves respect for the environment
C is regarded as unimportant by scientists
D encourages the squandering of resources

Nanoscience

Nanotechnologies are expected to provide a wide variety of very strong and light materials with unusual optical or electrical properties.

37. Nanoscience is the science of the extremely small, i.e. objects smaller than 100 nanometres. 100 nanometres is

A 0.00001 centimetres
B 0.00001 metres
C 0.000000001 centimetres
D 0.000000001 metres

38. Which of the following statements about nanoscience is **false**?

A nanoparticles might be a threat to health
B nanoparticles might cause environmental damage
C the public fully understands the implications of nanoscience
D unusual properties of nanoparticles mean that there is a need to proceed with caution

39. An advantage of using a sunscreen containing nanoparticles rather than a sunscreen without nanoparticles is

A nanoparticles give high protection from the sun without covering the skin in thick white powder
B the small nanoparticles soak into the skin
C nanoparticles do not absorb UV light
D nanoparticles are a new technology

40. Stain resistant trousers have been treated with nanoparticles. If orange juice is spilt on the trousers the liquid runs off rather than leaving a stain.
The nanoparticles prevent staining because their

A hydrophilic part attracts the water
B hydrophobic part attracts the water
C hydrophilic part is water repellant
D hydrophobic part is water repellant

TOTAL FOR HIGHER-TIER PAPER: 24 MARKS

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