

Surname	Initial(s)
Signature	

Paper Reference(s)

5008 5036

Edexcel GCSE

Science (5008)

Chemistry (5036)

C1b – Topics 7 and 8

Foundation and Higher Tier

Friday 20 June 2008 – 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.

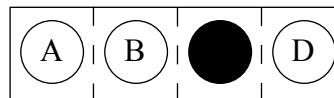
Before the test begins:

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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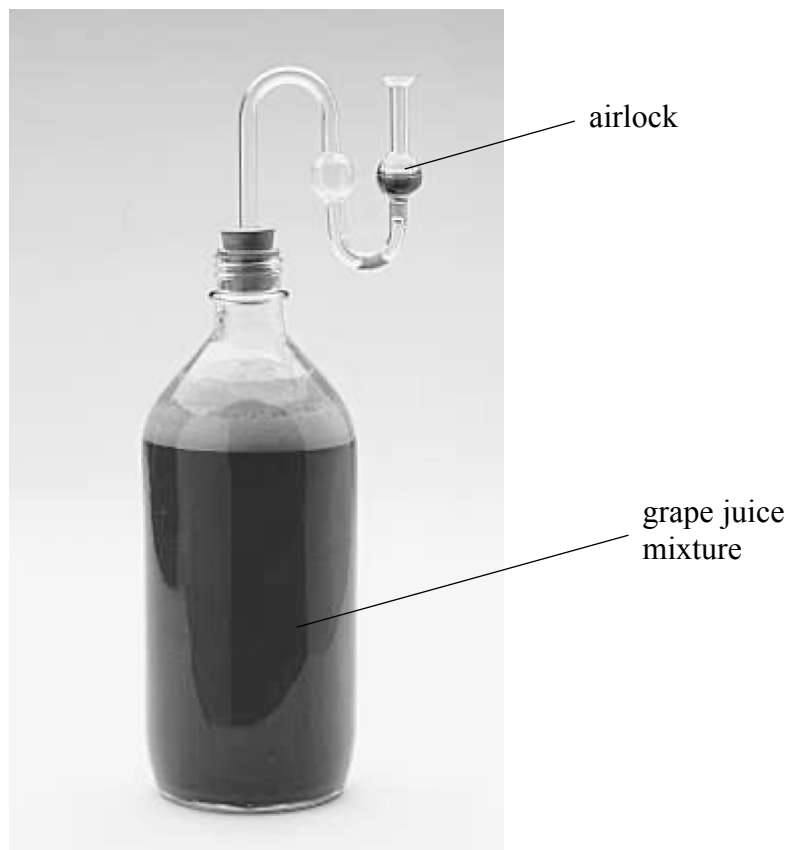


Turn over

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

Making wine

The photograph shows equipment that can be used to change grape juice into wine.



1. The grape juice is changed into wine by

- A distillation
- B fermentation
- C desalination
- D nanotechnology

2. An alcohol is produced in this process.
It is made from

- A water
- B carbon dioxide
- C carbon
- D sugar

3. The alcohol in wine is
- A ethane
 - B methanol
 - C ethanol
 - D methane
4. The airlock allows gases to escape but stops air from entering the wine. Which gas in air could react with the wine to spoil its taste?
- A nitrogen
 - B oxygen
 - C carbon dioxide
 - D water vapour

Heating homes

Many homes have central heating boilers that burn natural gas.



5. Natural gas is a useful fuel because
- A in the boiler it burns with a yellow flame
 - B supplies will never run out
 - C it produces no waste gases
 - D it produces no solid waste
6. Faulty gas boilers can be dangerous. Which row of the table correctly shows the types of combustion in a gas boiler which is working correctly and in one that is faulty?

type of combustion in		
	boiler working correctly	faulty boiler
A	complete	complete
B	incomplete	incomplete
C	incomplete	complete
D	complete	incomplete

7. Natural gas contains methane, CH₄.
Methane is
- A a hydrocarbon
 - B an element
 - C a carbohydrate
 - D an alcohol
8. The complete combustion of methane produces
- A carbon dioxide only
 - B carbon monoxide only
 - C carbon dioxide and water
 - D carbon monoxide and water
9. Carbon monoxide
- A helps to remove carbon dioxide from the body
 - B helps the blood carry oxygen
 - C prevents the blood from carrying oxygen
 - D is used to kill bacteria in drinking water
10. Which of these does **not** produce any carbon dioxide?
- A burning methane
 - B burning ethanol
 - C burning petrol
 - D burning hydrogen
11. One theory is that global warming is caused by greenhouse gases.
All greenhouse gases
- A allow extra heat to reach us from the Sun
 - B are less dense than air and escape from the Earth's atmosphere
 - C reduce the amount of heat escaping from the Earth
 - D damage the ozone layer and allow extra UV radiation to reach the Earth
12. John looks on the internet for information about global warming.
Which of these websites is most likely to provide him with reliable, unbiased information?
- A a car manufacturer's website
 - B a petrol company's website
 - C the 'prevent global warming' website
 - D the Royal Society of Chemistry website

Useful fabrics

13. Jane is climbing a mountain on a very cold day. Which of these is the most important property of the material used to make the jacket she is wearing?
- A smooth and elastic
 - B flame retardant
 - C light in weight
 - D good insulation

14. Stab-proof vests are available.



Which of these materials is likely to be used in a stab-proof vest?

- A steel
 - B Kevlar
 - C aluminium
 - D Lycra
15. Coolmax is a fabric that allows moisture from the surface of the skin to pass through it. Which of these is probably **not** made using coolmax?
- A swimming shorts
 - B sports shirt
 - C motor cycle helmet lining
 - D socks
16. Sympatex is a 'breathable' membrane used in many types of clothes. Sympatex is useful for these clothes because it
- A allows oxygen to pass in and carbon dioxide to pass out
 - B allows water vapour to pass out but stops water passing in
 - C allows carbon dioxide to pass out but stops water passing in
 - D allows oxygen to pass in and water vapour to pass out

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

Summer holidays

Clare often goes on long distance walks in the summer.



17. She uses a sun-screen containing nanoparticles of titanium(IV) oxide.
Her spectacles have lenses that darken in bright light.
Which row of the table describes the materials used in the sun-screen and her spectacle lenses?

	sun-screen	spectacle lenses
A	not smart	smart
B	not smart	not smart
C	smart	not smart
D	smart	smart

18. The nanoparticles of titanium(IV) oxide are
- A smaller than conventional particles of titanium(IV) oxide but larger than atoms
 - B smaller than atoms but larger than electrons
 - C smaller than atoms but larger than protons
 - D about 0.001 cm in size
19. Until recently waterproofing treatments for training shoes involved putting a waterproof layer of material into the shoe during manufacture.
Using nanotechnology a new waterproof coating has now been developed which can be applied to the outside of the shoe.
- An advantage of the new way of waterproofing compared to the old method is
- A the material of the shoe will become 'breathable'
 - B the outside of the shoe will not absorb water, which would increase the mass of the shoe
 - C this use of nanotechnology will improve everyone's life
 - D it will be easier to dispose of the shoes when they are worn out
20. Clare often has drinks in aluminium cans.
She recycles the empty cans.
It is important to recycle aluminium cans because
- A the cans can be refilled
 - B aluminium ores are very scarce
 - C aluminium cans do not corrode
 - D new products can be made from the recycled aluminium
21. Clare uses a lightweight tent on some of her walks.



The poles of the tent are reinforced with fibres.
Which of these fibres is likely to be used?

- A steel fibres that are strong and dense
- B Nomex fibres that are flame resistant
- C carbon fibres that are strong and light
- D Dacron fibres that provide good thermal insulation

22. Clare travels to her holiday location by car.
She knows that fumes from petrol engines cause pollution and she is interested in hydrogen-fuelled cars.
An advantage of using hydrogen, rather than petrol, as a fuel is
- A no product is formed when it burns
 - B it is easier to store than petrol
 - C burning hydrogen does not pollute the atmosphere
 - D it is a biofuel
23. The percentage of oxygen in dry air is approximately
- A 1
 - B 2
 - C 20
 - D 78
24. Oxygen can be obtained from the air by
- A fractional distillation
 - B chromatography
 - C electrolysis
 - D combustion

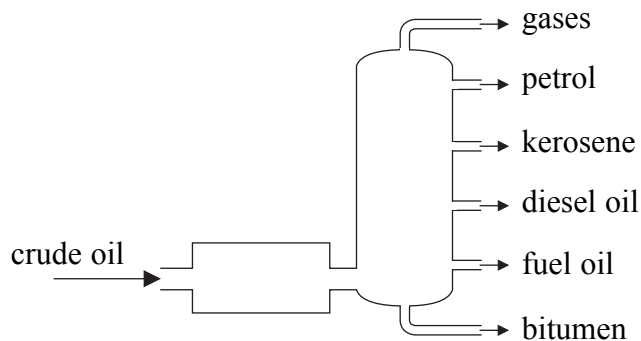
TOTAL FOR FOUNDATION TIER PAPER: 24 MARKS

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.

Crude oil

The diagram shows the fractions produced from crude oil by using a fractionating column.



25. The table shows some of the fractions with two suggested uses for each fraction. Which row of the table is correct?

	fraction	use 1	use 2
A	gases	fuel for cars	fuel for patio heaters
B	petrol	fuel for cars	fuel for ships
C	fuel oil	fuel for ships	fuel for patio heaters
D	bitumen	fuel for ships	waterproofing roofs

26. Which of the following statements are correct?

- 1 Crude oil enters the bottom of the fractionating column as a liquid.
- 2 When crude oil is vaporised, petrol and fuel oil vaporise at the same time.

- A** 1 only
B 2 only
C both 1 and 2
D neither 1 nor 2

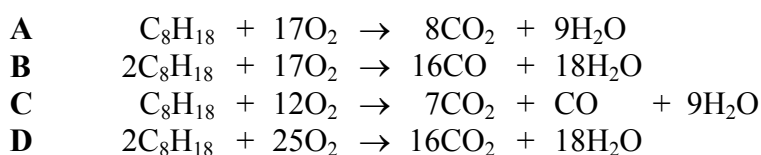
27. Which of the following statements about the fractions obtained from crude oil is correct?

- A** kerosene burns with a smoky flame to produce carbon dioxide and water only
B kerosene has a lower boiling point than diesel oil
C each fraction contains only one compound
D fuel oil burns more easily than diesel oil

28. Comparing petrol and kerosene, which row of the table is correct?

	average length of carbon chain in molecules in petrol	viscosity of petrol
A	shorter than kerosene	less than kerosene
B	longer than kerosene	less than kerosene
C	shorter than kerosene	more than kerosene
D	longer than kerosene	more than kerosene

29. One hydrocarbon in crude oil is octane, C₈H₁₈.
Which of these is the balanced equation for the complete combustion of octane?



Nanoscience and nanotechnology

30. Nanoparticles are used in some sunscreens.
Which row of the table is correct for these sunscreens?

	UV radiation reflected	visible light reflected
A	yes	yes
B	no	yes
C	yes	no
D	no	no

31. A number of people are concerned about the risks of using nanoparticles.
This is because

- A** the particles are too small to see
B nanoparticles can behave differently to conventional sized particles of the same substance
C nanoparticles did not exist until chemists invented them
D nanoparticles can make copies of themselves

32. Some glass has a metallic coating of nanoparticles which reflects heat from the sun. It also has an 'easy clean' coating that causes water to form droplets and run off the glass.

Which of the following statements are correct?

- 1 The metallic layer will not allow light to pass through it.
- 2 The 'easy clean' coating is hydrophilic.

- A** 1 only
B 2 only
C both 1 and 2
D neither 1 nor 2

Useful products, old and new

Some products have been available for many years, others have been developed recently and some are currently being developed.

33. Bleach and oven cleaners are two products used in the home. The table shows some substances that may be in these products and from where they are obtained. Which row of the table is correct?

	product	substance in product	this substance is obtained from
A	bleach	chlorine	liquid air
B	bleach	sodium	rock salt
C	oven cleaner	sodium hydroxide	rock salt
D	oven cleaner	sodium	sea water

34. Mayonnaise can be made from egg yolks, oil and vinegar. Lecithin in the egg yolks stops the oil and vinegar from separating.

Which of these statements are correct?

- 1 lecithin is an emulsifier.
- 2 the hydrophobic part of the lecithin molecule is attracted to the oil.

- A** 1 only
B 2 only
C both 1 and 2
D neither 1 nor 2

35. When brewing beer, several substances are in the fermentation vessel. Which row of the table shows **two** substances that are both **not** essential for the fermentation reactions to take place?

A	hops	yeast
B	water	carbon dioxide
C	malted barley	ethanol
D	carbon dioxide	ethanol

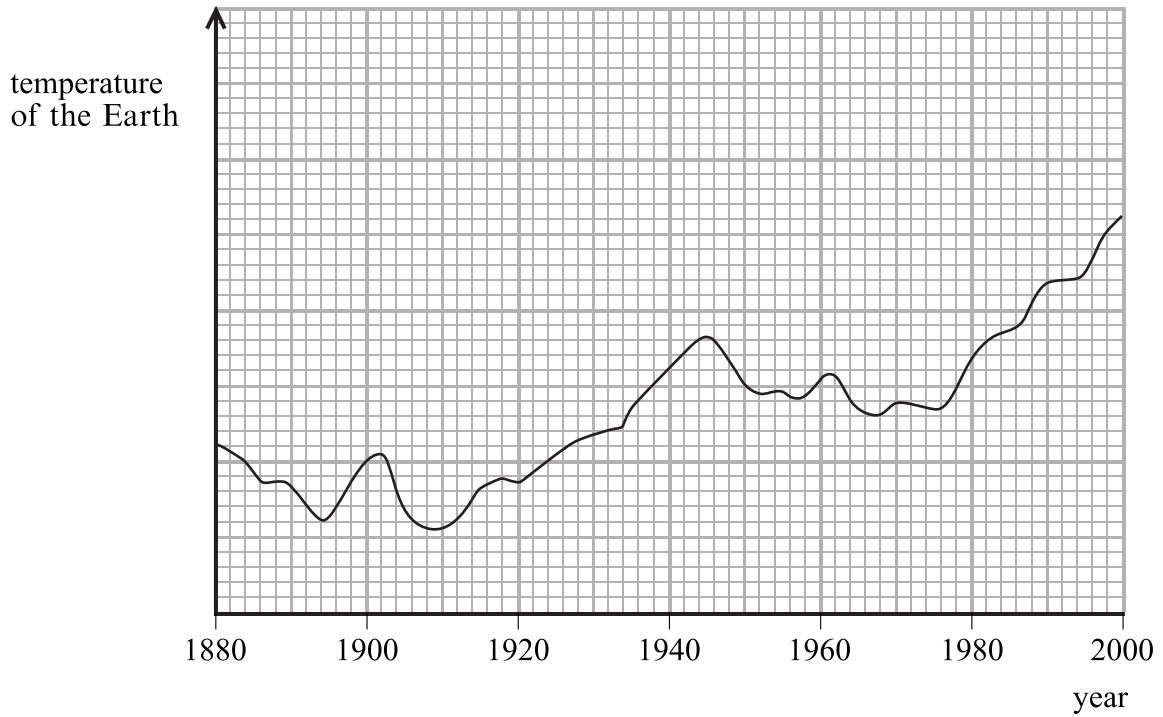
36. Ethanol is used as a fuel in some countries. The main disadvantage of using ethanol as a fuel is
- A** burning ethanol causes more pollution than burning petrol
 - B** ethanol is non-renewable
 - C** growing crops to produce ethanol takes up large areas of land
 - D** ethanol is likely to solidify in cold weather
37. Ethanol can be produced from sugar cane. Which of these is the balanced equation for a stage in this process?

- A** $C_6H_{12}O_6 \rightarrow 2C_2H_5OH + 2CO_2$
- B** $C_2H_4 + H_2O \rightarrow C_2H_5OH$
- C** $C_6H_{12}O_6 \rightarrow 2C_2H_4OH + 2CO_2 + H_2O$
- D** $C_2H_5OH + O_2 \rightarrow CH_3COOH + H_2O$

The Earth and its atmosphere

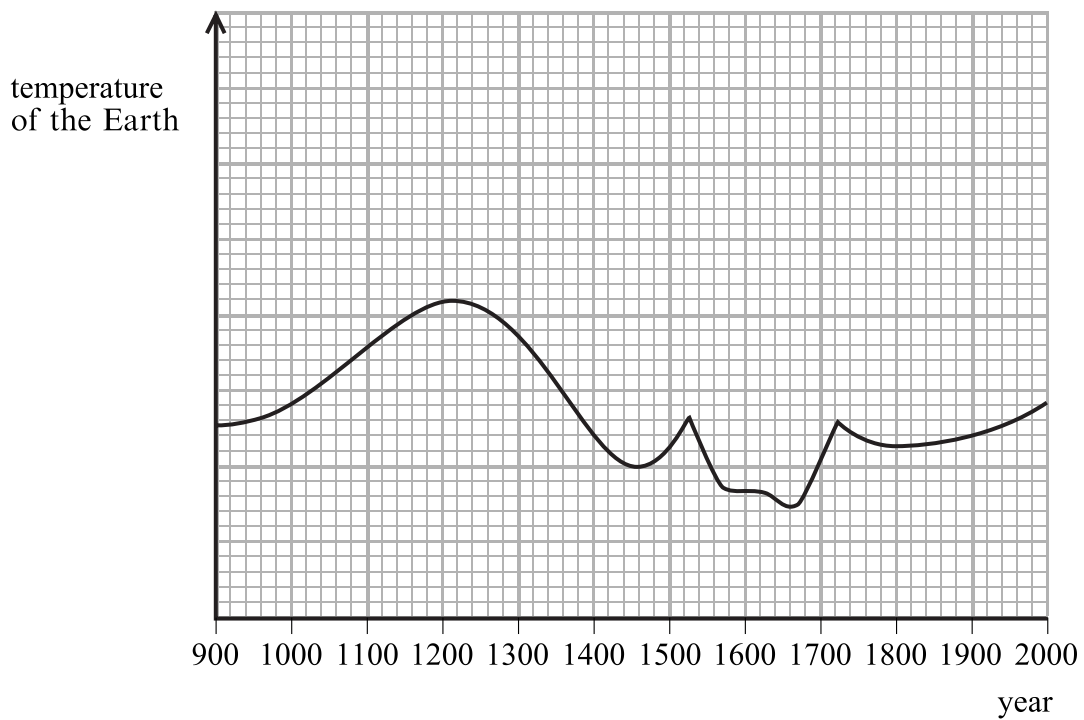
Graph 1 shows the temperature of the Earth between 1880 and 2000.

graph 1



Graph 2 shows the temperature of the Earth between 900 and 2000.

graph 2



38. Which of the following is a correct valid conclusion from both of these graphs?
- A the temperature of the Earth rises because of the burning of fossil fuels
 - B the temperature of the Earth in 2000 was the highest it has ever been
 - C the most rapid rise in the temperature of the Earth took place between 1894 and 1900
 - D there was an overall rise in the temperature of the Earth between 1900 and 2000
39. Scientists use computer models to make predictions about future climate changes. They cannot be certain about these predictions. The most likely reason that they cannot be certain is
- A the computers they use are not powerful enough
 - B the data used to make the predictions is unreliable
 - C the model they use is too simple
 - D the composition of the Earth's atmosphere and its temperature vary over time
40. In industry nitrogen is obtained from air. This is done by
- A removing the oxygen using heated copper
 - B liquefying the air and then raising the temperature until the liquid air boils
 - C cooling the air until the oxygen separates as a liquid
 - D dissolving the oxygen in water

TOTAL FOR HIGHER TIER PAPER: 24 MARKS

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