

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 5 March 2010 – 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.

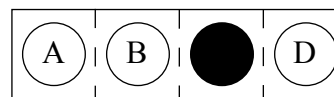
Before the test begins:

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

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

The Earth's atmosphere

The composition of the Earth's atmosphere has changed over time.

1. The amount of carbon dioxide in the atmosphere is increasing.
Carbon dioxide is produced by
 - A burning fossil fuels
 - B throwing away empty glass bottles
 - C planting more trees
 - D burning hydrogen

2. Our atmosphere contains approximately 78% of one gas.
This gas is
 - A carbon dioxide
 - B nitrogen
 - C oxygen
 - D water vapour

3. The Earth's early atmosphere was formed by gases emitted from volcanoes.
It is thought that this early atmosphere did not contain
 - A ammonia
 - B carbon dioxide
 - C water vapour
 - D oxygen

4. Some scientists are concerned about global warming.
Global warming is an increase in the
 - A temperature of the Sun
 - B number of hours of daylight
 - C temperature of the Earth
 - D size of the Earth's atmosphere

5. Scientists make predictions about future global warming.
Which row of the table is correct for these predictions?

	the predictions are made	the predictions are
A	using computer models	uncertain
B	using computer models	certain
C	without using computer models	uncertain
D	without using computer models	certain

Containers we use

6. The following is printed on a plastic carrier bag.

**This bag is made from 100% recycled plastic.
Please reuse this bag to help protect the environment.**

If plastic bags are reused, this will result in

- A more litter
 - B fewer natural resources used up
 - C more energy used for recycling
 - D more waste going into landfill sites
7. Paper bags can be used instead of plastic bags.
Paper bags are made from wood obtained from trees.
The use of paper is a sustainable development if
- A paper bags are burnt to dispose of them
 - B only trees cut down to clear land for building are used
 - C people use fewer bags when shopping
 - D trees cut down to make the bags are replaced by planting new trees
8. Glass bottles can be recycled by melting the glass to make new products.
One problem with recycling glass in this way is
- A there are too many glass bottles available for recycling
 - B the cost of recycling
 - C glass burns easily
 - D glass rots easily

Modern materials

9. Kevlar is used to reinforce racing-bike tyres.
Kevlar is especially suitable for this use because it
- A is a natural material
 - B has a low density and is strong
 - C has a low cost
 - D is not flammable
10. Some frying pans are coated with Teflon.
This use of Teflon
- A was the reason for the invention of Teflon
 - B was discovered after Teflon was first made
 - C is the only use for Teflon
 - D can make the food stick to the pan
11. Thinsulate is a material which traps air.
It is likely to be used to make
- A bullet proof vests
 - B hats to keep the head dry when it rains
 - C gloves to keep the hands warm
 - D beach towels
12. Gore-Tex is a 'breathable' waterproof fabric.
Which of these is **not** likely to contain Gore-Tex?
- A jackets for hill-walkers
 - B hiking boots
 - C swimming shorts
 - D ski gloves

Ethanol

Ethanol is found in alcoholic drinks.

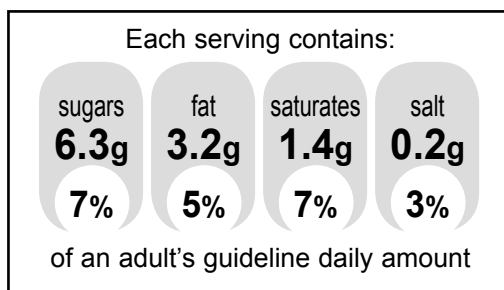
13. The alcoholic drink usually made from grapes is
- A beer
 - B whisky
 - C wine
 - D cider
14. Beer and wine are made by
- A fermentation
 - B distillation
 - C combustion
 - D desalination
15. Which of these **cannot** be caused by drinking alcoholic drinks?
- A antisocial behaviour
 - B liver damage
 - C clearer vision
 - D slower reactions
16. Ethanol is also used as a fuel.
An advantage of using ethanol, instead of petrol, as a fuel for cars is that
- A ethanol does not produce carbon dioxide when burnt
 - B ethanol does not produce water when burnt
 - C the only waste product of burning ethanol is water
 - D ethanol made from sugar is a renewable fuel

**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**

Food and drink

17. E322 is an emulsifier used in mayonnaise.
It is used to
- A stop the mayonnaise mixture separating
 - B make the mayonnaise less viscous
 - C add colour to the mayonnaise
 - D act as a preservative
18. Chocolate bars are often packaged in sealed wrappers made of plastic.
Plastic is used to help prevent
- A water vapour escaping from the chocolate
 - B oxygen escaping from the chocolate
 - C nitrogen reacting with the chocolate
 - D oxygen reacting with the chocolate
19. One plastic used to make the wrappers for chocolate bars is poly(ethene).
Poly(ethene) is a hydrocarbon.
The products of the complete combustion of poly(ethene) are
- A carbon and hydrogen
 - B carbon and water
 - C carbon dioxide and water
 - D ethene and carbon dioxide
20. Some seafood has a special label on the packet.
This label changes colour to indicate how fresh the food is.
This label
- A helps to keep the food fresh
 - B gives an example of intelligent packaging
 - C must be made of a nanocomposite
 - D must be biodegradable

21. This shows part of a label on some food.



The salt most often present in food is

- A** sodium hydroxide
B sodium hydrogencarbonate
C sodium carbonate
D sodium chloride
22. Nitrogen is used in some food packaging.
Nitrogen can be obtained from liquid air by
- A** combustion
B reacting air with another substance
C fractional distillation
D desalination
23. When alcoholic drinks are produced, sugar is converted into ethanol.
The word equation for this reaction is
- A** sugar + oxygen → ethanol
B sugar + yeast → ethanol
C sugar + yeast → ethanol + carbon dioxide
D sugar → ethanol + carbon dioxide
24. Desalination can be used to obtain drinking water from sea water.
Desalination
- A** can be achieved by filtration
B can be achieved by distillation
C requires no energy
D can only be carried out in hot countries

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.**

New materials

- 25.** John is on holiday.
To protect his skin, he uses a sunscreen.
The sunscreen contains nanoparticles of zinc oxide.
To protect his eyes, he wears sunglasses.
The lenses in the sunglasses become darker as the light becomes brighter.

Which row of the table describes the nature of the sunscreen and of the lenses in the sunglasses?

	the sunscreen is made from a material that is	the lenses are made from a material that is
A	smart	smart
B	not smart	not smart
C	not smart	smart
D	smart	not smart

- 26.** Nanoparticles, rather than larger particles, are present in some sunscreens.
Two possible reasons for using nanoparticles, rather than larger particles, are

- 1 the nanoparticles do not stop UV radiation
- 2 the nanoparticles do not reflect visible light

Which of these are correct?

- A** 1 only
B 2 only
C both 1 and 2
D neither 1 nor 2
- 27.** Which of these is the smallest particle?
- A** an atom of silicon
B a molecule of ethanol
C a particle of sand from a beach
D a nanoparticle of zinc oxide

28. The Royal Society published a report in which they recommended that the release into the environment of manufactured nanoparticles and nanotubes should be avoided as far as possible.

This recommendation was probably made because

- A nanoparticles have unusual properties which are not fully understood
- B all nanoparticles are toxic
- C nanoparticles released into the environment could multiply
- D nanoparticles increase global warming

29. Gore-Tex fabric contains a 'breathable' waterproof membrane. Which of these statements about Gore-Tex are correct?

- 1 The membrane has very small holes in it
- 2 Water molecules cannot pass through the membrane

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

30. Two types of glass which stay clean have been developed using nanotechnology. Glass X has a coating which prevents water droplets sticking to the glass. Glass Y has a coating which attracts water causing the water to spread out in a thin layer on the surface.

Which row of the table describes the nature of the coating on these two types of glass?

		coating on	
		glass X	glass Y
A	hydrophilic	hydrophobic	
B	hydrophobic	hydrophilic	
C	hydrophobic	hydrated	
D	hydrated	hydrophilic	

Fuels

31. Butane, C₄H₁₀, is present in a fraction obtained by the fractional distillation of crude oil. Which of these statements about this fraction are correct?

- 1 This fraction is obtained from the top of the fractionating column
 2 In this fraction, butane is present mixed with other substances

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

32. The incomplete combustion of butane produces carbon monoxide. Which of these is the balanced equation for this reaction?

- A $C_4H_{10} + 2O_2 \rightarrow 4CO + 5H_2$
 B $C_4H_{10} + 5O_2 \rightarrow 4CO + 5H_2O$
 C $C_4H_{10} + 4O_2 \rightarrow 4CO + 4H_2O + H_2$
 D $2C_4H_{10} + 9O_2 \rightarrow 8CO + 10H_2O$

33. Which line shows some fractions obtained from crude oil in order of their increasing boiling points?

lowest boiling point
→
 highest boiling point

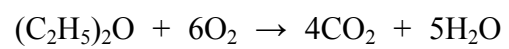
- A fuel oil diesel oil kerosene petrol
 B petrol kerosene diesel oil fuel oil
 C petrol diesel oil kerosene fuel oil
 D kerosene petrol fuel oil diesel oil

34. The table shows some fractions obtained from crude oil and two suggested uses of each fraction. Which row of the table is correct?

	fraction	use 1	use 2
A	gases	fuel for cars	fuel for aircraft
B	kerosene	fuel for aircraft	fuel for central heating boilers
C	diesel oil	fuel for cars	in road surfaces
D	bitumen	in road surfaces	fuel for central heating boilers

35. Ethanol produced from sugar cane is used as a fuel in some countries.
Which of these statements are correct?
- 1 Ethanol produced from sugar cane is a bio-fuel
2 Growing sugar cane removes carbon dioxide from the atmosphere
- A 1 only
B 2 only
C both 1 and 2
D neither 1 nor 2
36. Carbon monoxide is emitted in vehicle exhaust fumes.
Carbon monoxide
- A causes death by forming blood clots
B reacts with oxygen in the lungs
C increases the amount of carbon dioxide produced by the body
D reduces the amount of oxygen carried in the bloodstream
37. Other gases are also emitted in vehicle exhaust fumes.
These gases include carbon dioxide and hydrocarbons.
Which of these statements are correct?
- 1 The carbon dioxide is produced during combustion
2 The hydrocarbons are produced during combustion
- A 1 only
B 2 only
C both 1 and 2
D neither 1 nor 2
38. Hydrogen can be used as a fuel for cars.
The balanced equation for the complete combustion of hydrogen is
- A $\text{H}_2 + \text{O} \rightarrow \text{H}_2\text{O}$
B $\text{H}_2 + \text{O}_2 \rightarrow \text{H}_2\text{O}_2$
C $\text{H}_2 + \text{O}_2 \rightarrow \text{H}_2\text{O} + \text{O}$
D $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$
39. One disadvantage of using hydrogen as a fuel is that
- A the product of combustion is a pollutant
B toxic products can be formed by incomplete combustion
C making hydrogen requires energy
D there is a lack of raw material for producing hydrogen

40. Research has been carried out into the use of diethyl ether (DEE) as a fuel. The equation shows the complete combustion of DEE.



DEE could be useful as a fuel because

- A it is a hydrocarbon that burns to produce heat energy
- B it would not produce any products which would cause environmental problems
- C during complete combustion it burns producing heat energy and no solid residue
- D it does not produce gases during complete combustion

TOTAL FOR HIGHER TIER PAPER: 24 MARKS

END