

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 21 November 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.

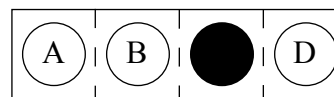
Before the test begins:

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

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

Fuels



Charcoal is a form of carbon.
It is used as a fuel for barbeques.

- All good fuels must
 - be solids
 - produce energy when they are burnt
 - produce ash when they are burnt
 - produce soot when they are burnt
- The complete combustion of charcoal produces
 - water
 - nitrogen
 - oxygen
 - carbon dioxide
- When a fuel is burnt the **only** product is water.
This fuel is
 - hydrogen
 - diesel
 - petrol
 - natural gas
- Charcoal can be a sustainable resource.
This means that it
 - will damage the environment
 - is renewable
 - is expensive
 - is running out

Use the following information to answer questions 5 and 6.

Charcoal can burn to form carbon monoxide.

5. The formula of carbon monoxide is

- A Co
- B C
- C CO
- D CO₂

6. Carbon monoxide is

- A green
- B a solid at room temperature
- C a liquid at room temperature
- D toxic

Use the following information to answer questions 7 and 8.

Lighting fluids or solid fire lighters can be used to light the charcoal on barbeques.

Lighting fluids are produced from crude oil.

Fire lighters contain kerosene.

7. The lighting fluids are mixtures of mainly

- A elements
- B oxides
- C hydrocarbons
- D water and sodium chloride

8. Kerosene is used as a fuel for

- A cars
- B aeroplanes
- C lorries
- D power stations

Materials for skiwear



9. The insides of ski boots are lined with Gore-Tex. Gore-Tex is used in ski boots because it
- A is a smart material
 - B allows water to enter
 - C keeps the feet dry
 - D has no 'breathability'
10. Skiers' gloves are made of a material which traps lots of air. Gloves to keep skiers' hands warm are most likely to be made of
- A Thinsulate
 - B Kevlar
 - C Lycra
 - D carbon fibre

Use the following information to answer questions 11 and 12.

Ski suits are coated in a waterproof fabric protector made from Teflon. The protector uses nanotechnology to provide a barrier that repels water.



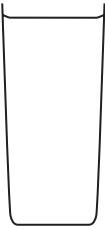

11. The use of Teflon as a fabric protector
- A is the only use of Teflon
 - B can be used only for ski suits
 - C allows rain water to enter the ski suit
 - D was discovered after it was first made

12. Which row of the table describes the Teflon barrier?

	the particles in the barrier are	the Teflon is
A	large	hydrophilic
B	very small	hydrophobic
C	large	hydrophobic
D	very small	hydrophilic

Alcoholic drinks

13. Different alcoholic drinks contain different amounts of ethanol. The amount of ethanol in drinks can be measured in units of ethanol.

				
type of drink	beer	whisky	lager	wine
volume of drink (cm ³)	290	25	290	175
units of ethanol	1	1	2	2

Which of these drinks contains the smallest number of units in 290 cm³ of the drink?

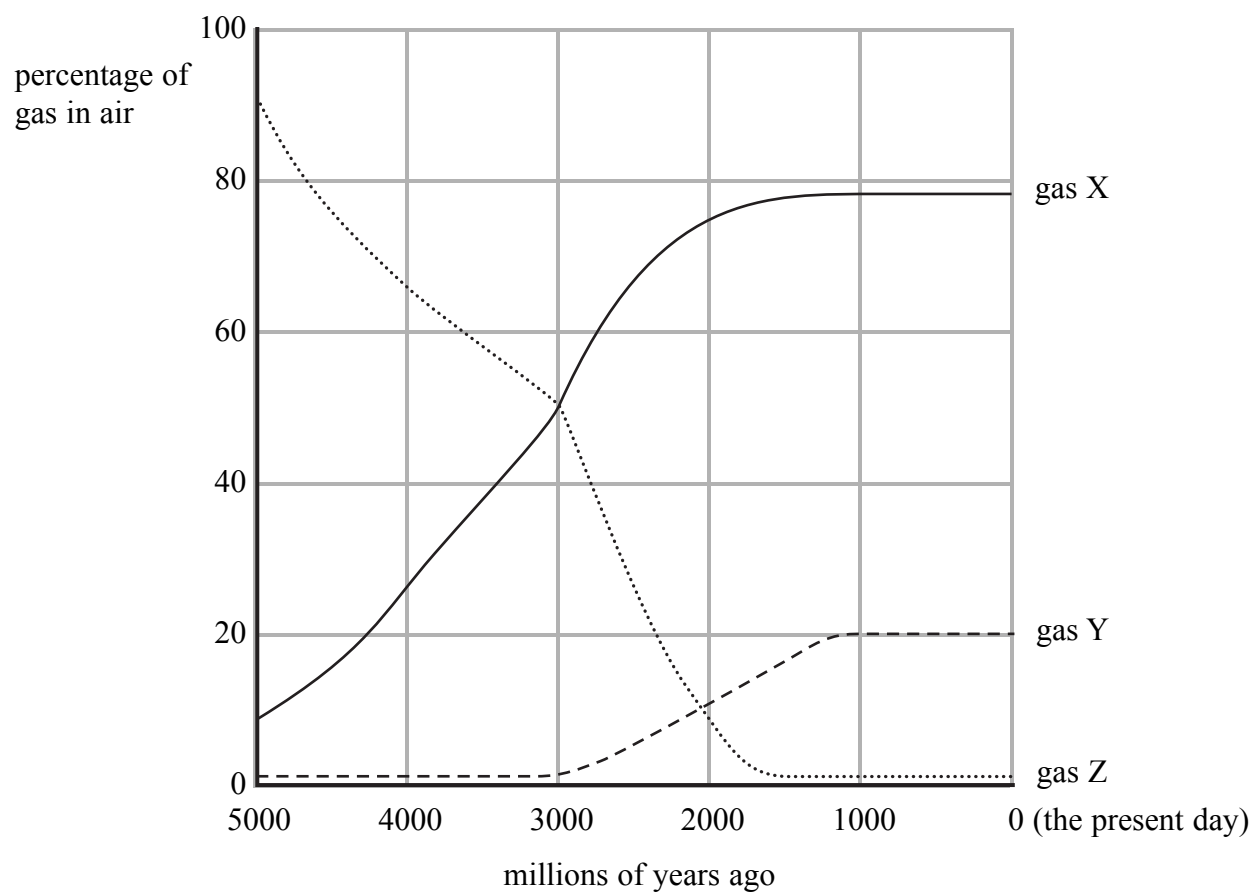
- A beer
- B whisky
- C lager
- D wine

14. Drinking several glasses of whisky leads to
- A improved vision
 - B faster reactions
 - C greater awareness
 - D delayed reaction times
15. Producing alcoholic drinks involves the use of
- A yeast and common salt
 - B common salt and sugar
 - C yeast and sugar
 - D flour and sugar
16. Wine left in an open bottle for a few days tastes sour because it has reacted with
- A oxygen
 - B nitrogen
 - C carbon dioxide
 - D argon

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

The Earth's atmosphere

The graph shows how the percentage of three gases, X, Y and Z, in the Earth's atmosphere have changed over the last five thousand million years.



Use the information from the graph to answer questions 17 and 18.

17. The percentages of all three gases in the atmosphere have remained almost unchanged for the last
- A 1000 million years
 - B 2000 million years
 - C 3000 million years
 - D 4000 million years
18. Gas X is
- A carbon dioxide
 - B argon
 - C oxygen
 - D nitrogen

19. Which of the following, present in the atmosphere, is least likely to contribute to global warming?
- A carbon dioxide
 - B hydrogen
 - C water vapour
 - D methane
20. Oxygen and nitrogen can be separated from liquid air by fractional distillation because they have different
- A solubilities
 - B densities
 - C boiling points
 - D reactivity

New materials

New materials are used to make some sunglasses and sunscreens.

21. Some sunglasses are made from a special glass which darkens in bright sunlight but goes colourless in the shade.
Glass that behaves in this way is said to be
- A breathable
 - B smart
 - C scratch resistant
 - D bio-degradable
22. Nanoparticles of zinc oxide are used in some sunscreens because they
- A reflect ultraviolet light
 - B form a white layer on the surface of the skin
 - C are not transparent to visible light
 - D form an oily layer on the surface of the skin
23. Some sunscreens are emulsions.
An emulsion is a mixture of
- A a gas and a liquid
 - B two liquids
 - C two gases
 - D two solids

24. Nanoparticles mixed with other materials are called

- A emulsifiers
- B nanocompounds
- C nanotubes
- D nanocomposites

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.**

Recycling and reducing waste

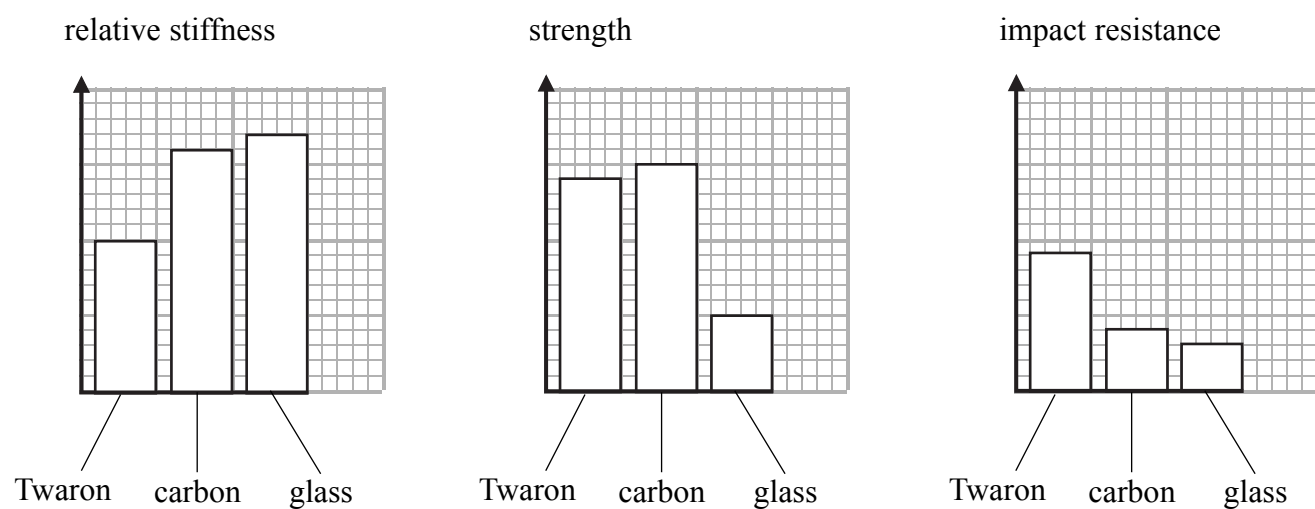
It is important that metals, such as aluminium, are recycled.
The use of paper-packaging and plastic carrier bags is being reduced.

- 25.** A reason for recycling aluminium is
- A** there is no demand for products made of aluminium
 - B** recycling increases the demand on landfill sites
 - C** recycling aluminium requires no energy
 - D** recycling conserves aluminium ores
- 26.** The amount of plastic waste produced could be decreased by
- A** using plastics that are difficult to recycle
 - B** using more non-biodegradable plastics
 - C** campaigns to encourage people to reuse plastic carrier bags
 - D** using more plastic carrier bags
- 27.** The Earth's natural resources are being used up.
These resources are protected by the development of
- A** more landfill sites
 - B** sustainability
 - C** the production of paper from large areas of forest
 - D** oil exploration in remote areas
- 28.** Drinking water is obtained from seawater using three processes.
In which row are the processes in the correct order?
- | | | | |
|----------|--------------|--------------|--------------|
| A | condensation | evaporation | filtration |
| B | evaporation | filtration | condensation |
| C | filtration | condensation | evaporation |
| D | filtration | evaporation | condensation |

Man-made fibres

Use the following information to answer questions 29 to 32.

The bar charts compare three properties of three man-made fibres.
The charts show the relative stiffness, strength and impact resistance of each fibre.



Glass fibre, carbon fibre and Twaron are used to make speedboats.
It is known that the stiffer a fibre is, the more likely it is to break.

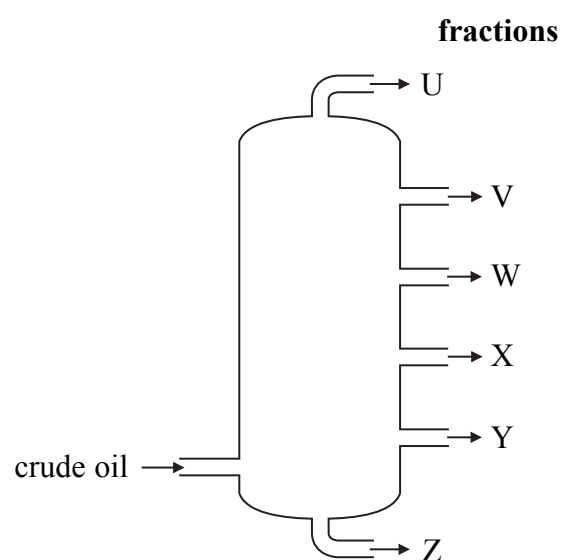
29. Speedboats made of glass fibre would be
- A less likely to be damaged by impact with objects in the water than boats made of carbon fibre
 - B stronger than boats made of Twaron fibre
 - C less likely to break than boats made of carbon fibre
 - D weaker than boats made of carbon fibre
30. Some speedboats are made of Twaron fibre combined with carbon fibre, rather than carbon fibre alone.
The Twaron fibre is added
- A to increase the strength of the material
 - B because glass to make glass fibre is not readily available
 - C to lower the risk of the material breaking
 - D to lower the resistance of the material to impact damage with objects in the water
31. Which material would be best for bullet-proof vests?
- A Twaron fibre
 - B glass fibre
 - C carbon fibre
 - D a combination of glass fibre and carbon fibre

32. Which of these materials has properties most similar to the properties of Twaron?

- A Lycra
- B Teflon
- C Thinsulate
- D Kevlar

Crude oil

The diagram shows a fractionating column used to separate crude oil into useful fractions.



33. Which row of the table correctly describes the temperatures in the fractionating column and the size of the molecules in fraction V?

	temperature in the column	size of molecules in fraction V
A	highest at the bottom	smaller than in fraction U
B	lowest at the bottom	larger than in fraction W
C	highest at the top	smaller than in fraction X
D	lowest at the top	larger than in fraction U

34. Which two fractions are used as fuels in cars and lorries?

- A U and Y
- B V and X
- C V and Y
- D X and Z

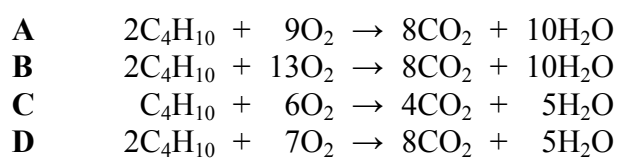
Use this information to answer questions 35 and 36.

Butane, C₄H₁₀, is obtained from the fraction U and is used as a fuel for cookers in caravans.

35. Which row of the table shows why caravans must be well ventilated when butane-fuelled cookers are used?

	to prevent the process of	to prevent the formation of
A	complete combustion	carbon monoxide
B	incomplete combustion	carbon dioxide
C	complete combustion	carbon dioxide
D	incomplete combustion	carbon monoxide

36. Which is the balanced equation for the complete combustion of butane?



Bio-fuels

Bio-ethanol is a bio-fuel which is produced by fermentation of some crops.

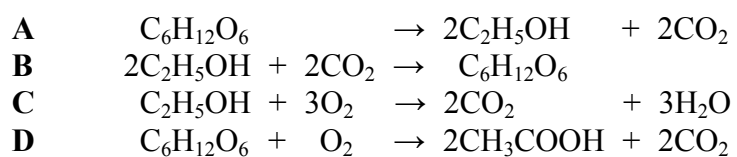
37. Three possible conditions for the production of bio-ethanol by fermentation are

- 1 a temperature of 80°C
- 2 presence of yeast
- 3 presence of oxygen

Which of these conditions are necessary for a successful fermentation?

- A** 1 only
B 2 only
C 3 only
D 2 and 3 only

38. Which of these equations correctly represents a fermentation reaction?



39. Bio-fuels, such as bio-ethanol, are sometimes considered to be attractive alternatives to fossil fuels.

This is because the carbon dioxide released by the burning of bio-ethanol

- A** is the only product of the combustion
- B** is not a greenhouse gas
- C** is balanced by the carbon dioxide absorbed when the plants are grown to produce the bio-ethanol
- D** is more easily absorbed by the oceans

40. Here are three statements about bio-fuels.

- 1 bio-fuels can only be produced from sugar cane and sugar beet
- 2 the increased use of bio-fuels has no effect on the availability of land for food production
- 3 the demand for petrol will be increased by the production of bio-fuels

Which of these statements are correct?

- A** 1 only
- B** 2 only
- C** 3 only
- D** none of these

TOTAL FOR HIGHER TIER PAPER: 24 MARKS

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