

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 17 June 2011 – Afternoon

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.

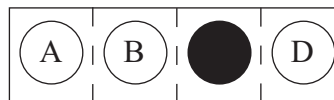
Before the test begins:

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.**

Burning fuels



1. Methane is a hydrocarbon which is used as a fuel.
Hydrocarbons are compounds containing
 - A carbon and oxygen only
 - B carbon and hydrogen only
 - C carbon, hydrogen and oxygen
 - D carbon, hydrogen and nitrogen

2. Incomplete combustion of a hydrocarbon can form carbon monoxide.
Carbon monoxide is formed in this reaction because there is not enough
 - A heat
 - B hydrocarbon
 - C oxygen
 - D nitrogen

3. If a gas-fired boiler is not checked regularly, it can be dangerous to use it.
The biggest danger is that using a boiler that has not been checked may
 - A release waste gases
 - B release a toxic gas
 - C waste fossil fuel
 - D waste heat energy

4. Burning hydrogen produces
 - A water only
 - B carbon dioxide only
 - C water and carbon dioxide
 - D water and carbon monoxide

5. Which of these is a fossil fuel?

- A hydrogen
- B natural gas
- C oxygen
- D water

6. Bio-fuels are produced from plants.

A disadvantage of using bio-fuels instead of fossil fuels is that

- A growing plants, from which they are made, uses large areas of fertile land
- B growing plants, from which they are made, produces large amounts of carbon dioxide
- C they always burn with a sooty flame
- D they produce no energy when burnt

Kevlar

A comfortable, protective jacket has been made for use by police in dangerous situations. The jacket has a Kevlar lining.

7. What properties does Kevlar have that make it suitable for this use?

- A lightweight and magnetic
- B odourless and colourless
- C hard and transparent
- D stab resistant and flexible

8. Steel could be used instead of Kevlar.

Kevlar is preferred to steel.

This is because Kevlar is

- A less flexible
- B less dense
- C more expensive
- D heavier

Food

9. When vegetable oil and vinegar are mixed, shaken and left for some time, they separate. When egg yolk is mixed with these two liquids, they do not separate after shaking and mayonnaise is formed. Mayonnaise is
- A a compound
 - B a salt
 - C an element
 - D an emulsion
10. Foods can be preserved by removing
- A carbon dioxide
 - B nitrogen
 - C salt
 - D water
11. A gas is put into some packets of peanuts before the packets are sealed.



- The gas keeps the peanuts in good condition.
The best gas for this purpose is
- A carbon monoxide
 - B hydrogen
 - C oxygen
 - D nitrogen
12. A new lunchbox has been designed which has a special coloured spot on it. The spot changes colour, as the temperature rises. The coloured spot must be made of a material that is
- A soluble
 - B smart
 - C toxic
 - D breathable

Alcohol

Beer is an alcoholic drink.

13. Beer is made by
- A combustion
 - B desalination
 - C fermentation
 - D fractional distillation
14. Most of the alcohol in beer is
- A ethanol
 - B glucose
 - C methanol
 - D water
15. Drinking alcohol can damage your health.
Government information states that

a healthy, adult male should not drink more than 4 units of alcohol a day
a healthy, adult female should not drink more than 3 units of alcohol a day

The table shows the alcohol in some drinks.

drink	volume of drink (cm ³)	number of units of alcohol in the glass
small glass of wine	125	1.5
large glass of wine	250	3.0
large glass of standard lager	568	2.3
small glass of strong cider	284	2.3

A healthy, adult male would drink more than the stated daily amount of alcohol, in one day, if he drank

- A two small glasses of wine
 - B one large glass of wine
 - C one large glass of standard lager
 - D two small glasses of strong cider
16. One effect of drinking too much beer is
- A faster response times
 - B improved awareness
 - C improved vision
 - D slower reactions

**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.**

Using substances

17. Hydrogen could be a useful fuel in the future.
An advantage of using hydrogen as a fuel is that
- A it is a bio-fuel obtained from plants
 - B it is easily obtained from liquid air
 - C no energy is used to produce it
 - D the raw material from which it is obtained is readily available

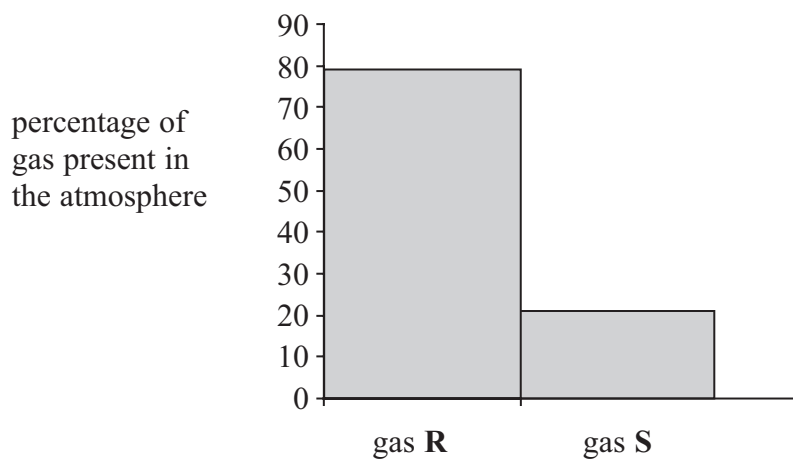
Use the following information to answer questions 18 and 19.

Manufacturers make paper from wood pulp obtained from trees.

18. Some manufacturers plant three trees for every tree they cut down.
By doing this, these manufacturers are making sure that their product is
- A high quality paper
 - B easy to recycle
 - C non-renewable
 - D sustainable
19. Many companies now recycle paper.
A reason for recycling paper, rather than making new paper from raw materials, is that
- A paper is not biodegradable
 - B paper is made from non-renewable substances
 - C recycling conserves raw materials
 - D recycling uses no energy

The Earth

20. The bar chart shows the percentage of the atmosphere which is gas R and the percentage of the atmosphere which is gas S.



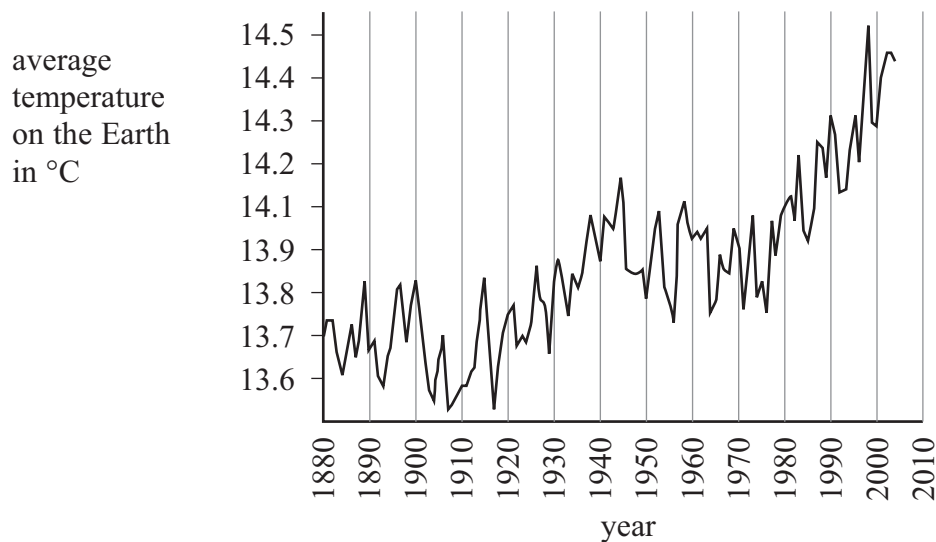
What is the name of gas **R**?

- A oxygen
 - B argon
 - C nitrogen
 - D hydrogen
21. Which of the following gases in the atmosphere is most likely to contribute to global warming?
- A carbon dioxide
 - B hydrogen
 - C nitrogen
 - D oxygen
22. Oxygen is obtained from liquid air by
- A combustion
 - B desalination
 - C fermentation
 - D fractional distillation

23. Which row of the table shows how the amounts of carbon dioxide and oxygen in the Earth's atmosphere have changed since the Earth was formed?

	amount of	
	oxygen	carbon dioxide
A	increased	increased
B	increased	decreased
C	decreased	increased
D	decreased	decreased

24. The graph shows the average temperature on the Earth from 1880 to 2005.



Using the graph, scientists can be certain that, during this period, the average temperature on Earth has

- A** decreased every year
- B** increased every year
- C** increased overall
- D** increased because of the increased use of fossil fuels

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.**

Useful materials

25. Chemists have investigated coatings for the underside of skis.
The ideal coating needs to be very slippery.
Which of these would make the best coating?

- A Gore-Tex
- B Kevlar
- C Lycra
- D Teflon

26. Jackie buys a new jacket for skiing.
The jacket is made of waterproof and breathable fabric.
The fabric is waterproof and breathable because it has

- A loosely packed fibres which trap air
- B small molecules with strong bonds between the atoms
- C a membrane with microscopic pores not much bigger than a water molecule
- D a membrane with pores much bigger than a water molecule

27. When Jackie goes skiing she buys a bottle of sunscreen.
The sunscreen contains an emulsifier.
Molecules of the emulsifier have a hydrophilic part and a hydrophobic part.
Which row of the table gives a correct description of hydrophilic or hydrophobic?

A	hydrophobic	water loving	attracted to oil	repels water
B	hydrophobic	water hating	attracted to water	repels oil
C	hydrophilic	water loving	attracted to water	repels oil
D	hydrophilic	water hating	attracted to oil	repels water

28. Some sunscreens contain nanoparticles, others do not.
An advantage of sunscreens containing nanoparticles is

- A nanoparticles are a new technology
- B all nanoparticles are known to be safe
- C the nanoparticles do not absorb UV light
- D the nanoparticles give good protection from the sun but do not leave a white covering on the skin

29. Which of the following statements about nanotechnology are correct?
- 1 a material that has nanoparticles used in combination with another material is known as a nanocomposite
 - 2 nanoparticles are bigger than individual atoms
- A** 1 only
B 2 only
C both 1 and 2
D neither 1 nor 2

Crude oil

Fractions are obtained from crude oil by fractional distillation.

30. Which of the following is a use of the gaseous fraction?
- A** fuel for aeroplanes
B fuel for some cars
C fuel for ships
D fuel for some diesel engines
31. Fraction **Y** is obtained from the top of the fractionating column and fraction **Z** is obtained from the bottom of the fractionating column.
 Which row of the table correctly compares fraction **Y** with fraction **Z**?

	boiling point of fraction Y	average length of carbon chain in fraction Y
A	lower	shorter
B	higher	longer
C	lower	longer
D	higher	shorter

32. Which of the following statements about the viscosity of fractions are true?
- 1 fractions containing longer chain hydrocarbon molecules have higher viscosities than fractions containing shorter chain hydrocarbon molecules
 - 2 a fraction with a higher viscosity will be harder to ignite than a fraction with a lower viscosity
- A** 1 only
B 2 only
C both 1 and 2
D neither 1 nor 2

33. Propane is a fuel.
Which is the balanced equation for the complete combustion of propane?

- A** $C_3H_8 + 2O_2 \rightarrow 3C + 4H_2O$
B $C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$
C $2C_3H_8 + 7O_2 \rightarrow 6CO + 8H_2O$
D $C_3H_8 + 7O_2 \rightarrow 3CO_2 + 8H_2O$

34. Incomplete combustion of hydrocarbons can form carbon monoxide.
Which of the following statements about carbon monoxide are correct?

- 1 carbon monoxide is a colourless gas with a pungent odour
2 carbon monoxide is toxic because it prevents oxygen being carried around the body

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

35. Incomplete combustion of hydrocarbons can also produce carbon in the form of soot.
What is the correct atomic symbol, with its state symbol, for carbon in the form of soot?

- A** c (g)
B C (g)
C c (s)
D C (s)

Salt

36. Sodium chloride and pure water can be obtained from seawater by

- A** desalination
B electrolysis
C fermentation
D filtration

37. Which row of the table shows correct uses of sodium chloride and of sodium hydroxide?

	use of sodium chloride	use of sodium hydroxide
A	to make paper	to produce soap
B	to make paper	to absorb acidic gases
C	as a preservative	to absorb acidic gases
D	to flavour food	to absorb alkaline gases

38. Sodium hydroxide is obtained from sodium chloride solution.
The formula of sodium hydroxide is

- A Na_2OH
- B NaOH_2
- C $\text{Na}(\text{OH})_2$
- D NaOH

Fermentation

39. Ethanol is made by fermentation.
The reaction mixture for the process contains yeast.
Which of the following statements about this process are correct?

- 1 after a time the yeast is used up and no more ethanol is produced
- 2 the ideal temperature for the process is 70°C

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

40. Which is the balanced equation for the formation of ethanol from a sugar?

- A $\text{C}_6\text{H}_{12}\text{O}_6 \rightarrow 2\text{C}_2\text{H}_5\text{OH} + 2\text{CO}_2$
- B $\text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2 \rightarrow 6\text{CO}_2 + 6\text{H}_2\text{O}$
- C $2\text{C}_2\text{H}_5\text{OH} + 2\text{CO}_2 \rightarrow \text{C}_6\text{H}_{12}\text{O}_6$
- D $\text{C}_2\text{H}_5\text{OH} + 3\text{O}_2 \rightarrow 2\text{CO}_2 + 3\text{H}_2\text{O}$

TOTAL FOR HIGHER TIER PAPER: 24 MARKS

END