

Surname	Initial(s)
Signature	

Paper Reference(s)

**5008                      5036**  
**Edexcel GCSE**

**Science (5008)**

**Chemistry (5036)**

C1b – Topics 7 and 8

**Foundation and Higher Tier**

Thursday 22 November 2007 – 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.

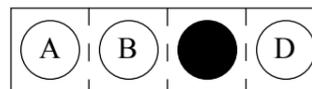
**Before the test begins:**

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.**

### **Gloves**

Gloves are worn for many different reasons.  
Most gloves are designed for a specific purpose.

1. Thinsulate is a good insulator.  
In winter, gloves made from thinsulate will help to keep hands

**A** dirty  
**B** wet  
**C** cold  
**D** warm

2. Kevlar is a fibre that is five times stronger than steel.  
Some gardening gloves contain Kevlar.  
The Kevlar is used in the gloves to

**A** protect the hands from being cut  
**B** make the gloves breathable  
**C** keep the hands warm  
**D** improve grip

3. Some work gloves have small dots of rubber on the outside that partially cover the surface.



These dots are added to

**A** make the gloves fireproof  
**B** improve the grip  
**C** make the gloves cooler to wear  
**D** prevent liquids entering the gloves

### In the kitchen

Teflon was discovered in 1938. Sixteen years later, the first Teflon-coated pan was produced.

4. Frying pans are often coated in Teflon.  
The Teflon coating
- A keeps the pan cool
  - B soaks up the fat during cooking
  - C tells you when the temperature is correct for cooking
  - D stops the food sticking to the pan
5. This use of Teflon to coat pans
- A was the reason Teflon was made
  - B is a very recent use of Teflon
  - C was known in 1937
  - D was discovered after Teflon was made
6. Some frying pans have a coloured spot in the centre of the base.



This spot shows when the pan is hot enough for cooking food by changing colour.  
The material used for the spot

- A is smart
- B is toxic
- C melts at 30°C
- D burns at 60°C

### Caring for the environment

Scientists have measured the temperature of the Earth over the last 200 years and know that the temperature has risen in this period.

7. This rise in temperature is known as
- A the hole in the ozone layer
  - B atmospheric depletion
  - C global warming
  - D the mad scientists' theory
8. Many scientists believe that the increase in the temperature of the Earth is caused by greenhouse gases.  
Greenhouse gases
- A come from outer space
  - B reduce the amount of heat escaping from the Earth
  - C reflect light
  - D stop all heat from the Sun reaching the Earth
9. One greenhouse gas is carbon dioxide.  
The amount of carbon dioxide in the Earth's atmosphere is increasing.  
Many scientists believe that a major reason for this increase is
- A the burning of fossil fuels
  - B planting forests
  - C the burning of hydrogen
  - D creating National Parks
10. Wood is an important material with many uses.  
Some people think that wood should only be obtained from a sustainable forest.  
A sustainable forest is a forest
- A which must be cut down to clear land for building
  - B in which new trees are planted when trees are cut down
  - C in which all the wood is used for building materials
  - D where no trees are cut down
11. People produce a lot of rubbish.  
The best way to dispose of plastic rubbish and cause least harm to the environment is to
- A burn it
  - B put it in a landfill site
  - C put it in a skip
  - D recycle it

12. It is very important to recycle newspapers because
- A they are non-biodegradable
  - B they are made from non-renewable resources
  - C making the paper uses up raw materials
  - D they cannot be disposed of by burning

**Air**

13. The percentage of oxygen in dry air is approximately
- A 1
  - B 2
  - C 21
  - D 78
14. Since the Earth was formed, the percentage of oxygen in the atmosphere has
- A increased from 0%
  - B increased from 10%
  - C remained the same
  - D decreased
15. Food is often wrapped in plastic cling film to prevent air reaching it. Which gas in air needs to be present for food to decay?
- A nitrogen
  - B oxygen
  - C argon
  - D neon
16. Food packaging which has a spot which changes colour when the food is no longer fresh enough to eat is being developed. The use of this spot means the packaging is
- A colour fast
  - B microbe resistant
  - C cool
  - D intelligent

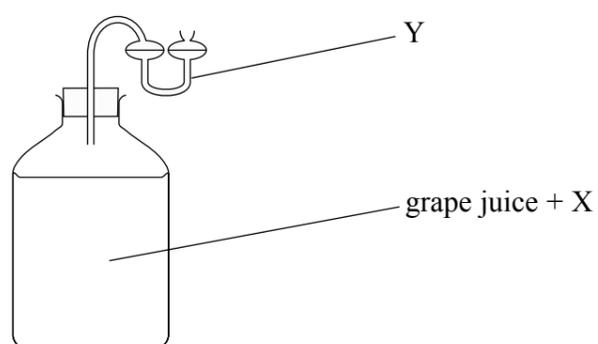
**Higher tier candidates start at question 17 and answer questions 17 to 40.**  
**Questions 17 to 24 must be answered by all candidates: Foundation tier and Higher tier.**

### Ethanol

Ethanol can be produced from some sugars.  
The sugars usually come from plants.

*Use the following information to answer questions 17 to 19.*

Some people produce wine from grape juice using this equipment



17. X must be added to change the grape juice into wine containing ethanol.  
X is

**A** water  
**B** sugar  
**C** yeast  
**D** oxygen

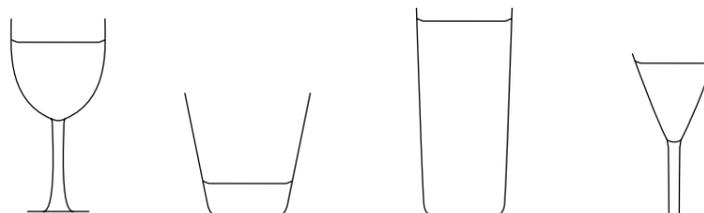
18. The process that changes grape juice into wine is

**A** distillation  
**B** hydration  
**C** fermentation  
**D** evaporation

19. Y allows a gas produced in the reaction to escape.  
The gas is

**A** air  
**B** carbon dioxide  
**C** oxygen  
**D** methane

20. The diagrams show glasses containing four different alcoholic drinks.



	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
alcoholic drink	wine	whisky	beer	port
volume of drink (cm <sup>3</sup> )	125	25	250	50
ethanol in drink (%)	10	40	4	20

Which glass actually contains the most ethanol?

21. Ethanol, made from plants, can be used instead of petrol as a fuel for cars. Which of these is **not** an advantage of using ethanol instead of petrol?
- A** ethanol can be made in countries that do not have their own reserves of crude oil  
**B** using ethanol preserves stocks of crude oil  
**C** growing plants to produce ethanol removes carbon dioxide from the atmosphere  
**D** ethanol produces carbon dioxide when it burns
22. Ethanol is called a bio-fuel because it
- A** is non-renewable  
**B** produces no pollution  
**C** is produced from living things  
**D** uses oxygen and produces carbon dioxide
23. Which row of the table shows why ethanol is a useful fuel?

	heat energy is produced during burning	solid residue is produced during burning
<b>A</b>	yes	no
<b>B</b>	no	yes
<b>C</b>	yes	yes
<b>D</b>	no	no

24. Bio-butanol is a new fuel which the producers intend to market.  
Bio-butanol has a higher energy content per litre than bio-ethanol.  
An advantage of bio-butanol compared to bio-ethanol is
- A it is produced from renewable resources
  - B under the same conditions a car will use less volume of fuel
  - C it can be used instead of petrol
  - D it produces different waste products

**TOTAL FOR FOUNDATION TIER PAPER: 24 MARKS**

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**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.**

**In the kitchen**

25. Many oven cleaners contain sodium hydroxide.  
Sodium hydroxide can be made from
- A sea water or rock salt
  - B sea water only
  - C rock salt only
  - D neither sea water nor rock salt
26. The action of many kitchen cleaners depends on surfactants.  
Surfactants have particles with water-loving heads and oil-loving tails.  
Surfactants are
- A smart materials
  - B intelligent materials
  - C emulsions
  - D emulsifiers
27. John has a wine thermometer to check the temperature of his wine.  
The thermometer has a plastic strip containing material that changes colour to show the temperature of the wine.  
The plastic strip is attached to a stainless steel clip that fits on the bottle.



Which row of the table describes these two materials?

	material that changes colour	stainless steel
<b>A</b>	smart	smart
<b>B</b>	smart	not smart
<b>C</b>	not smart	smart
<b>D</b>	not smart	not smart

### Nanotechnology

*Use the following information to answer questions 28 and 29.*

Some glass is self-cleaning.

It has a layer of nanoparticles of titanium(IV) oxide on its surface.

The nanoparticles attract water causing the water to spread out into a thin layer on the surface and not form droplets.

**28.** The layer of nano dimensions

- A** is very thin
- B** is easily seen
- C** soaks up water
- D** washes off when it rains

**29.** The layer of titanium(IV) oxide is

- A** hydrophilic
- B** hydrophobic
- C** hydrogenated
- D** dehydrated

**30.** Spheres of nanoparticles are used in some deodorants.

The spheres release chemical substances slowly so that the deodorant works throughout the day.

Here are three possible reasons why people buy these deodorants.

- 1 They are very well informed about nanotechnology and know that nanotechnology always produces products that are good for the environment.
- 2 They like the description of the product and think that it will work well.
- 3 Nanotechnology always produces the cheapest products because it uses very small particles.

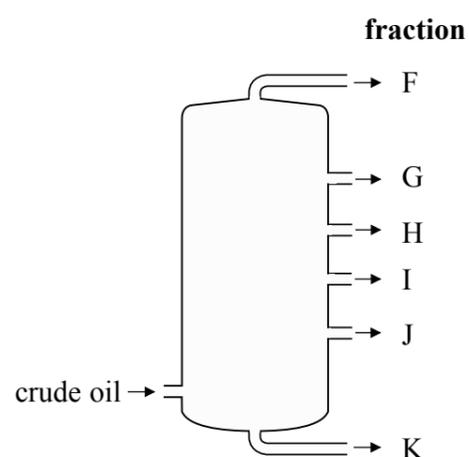
Which of these are the most likely reasons for people to buy these deodorants?

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

### Crude oil

Use the following information to answer questions 31, 32 and 33.

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



31. Which of the following statements is **not** correct?
- A Each fraction contains a number of different hydrocarbons
  - B Fractions condense in the tower at different temperatures
  - C Crude oil is vaporised before it enters the column
  - D Fractions with the lowest boiling points are collected from the bottom of the column
32. Comparing fraction H and J.  
Which row of the table is correct?

	average length of carbon chain in H	viscosity of H
A	longer than J	lower than J
B	longer than J	higher than J
C	shorter than J	lower than J
D	shorter than J	higher than J

33. Which row of the table is correct?

	<b>fraction</b>	<b>name</b>	<b>average number of carbon atoms in a molecule</b>	<b>used as fuel for</b>
<b>A</b>	G	petrol	3	cars
<b>B</b>	H	kerosene	15	planes
<b>C</b>	I	fuel oil	20	ships
<b>D</b>	J	diesel oil	40	lorries

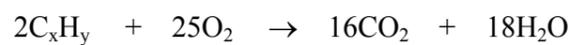
### Gases in the air

Some chemical reactions use oxygen from the air and release other gases into the air.

34. Which of these does **not** release carbon dioxide into the atmosphere?

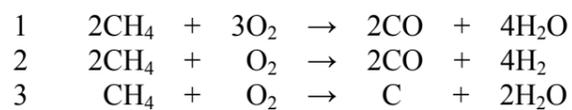
- A** burning fossil fuels
- B** burning bio-diesel
- C** producing ethanol from sugar
- D** separating petrol from vaporised crude oil

35. This equation represents the burning of the compound  $C_xH_y$



The formula of the compound is

- A**  $C_8H_{16}$
  - B**  $C_8H_{18}$
  - C**  $C_{16}H_{36}$
  - D**  $C_{32}H_{36}$
36. Methane,  $CH_4$ , is used as a fuel.  
Which of these are balanced equations for reactions occurring in the incomplete combustion of methane?



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

- 37.** Carbon monoxide is present in vehicle exhaust fumes.  
This gas
- A** is absorbed through the skin
  - B** increases the ability of blood to carry oxygen
  - C** causes death by forming blood clots
  - D** combines with haemoglobin in the lungs
- 38.** Some cars use hydrogen, instead of petrol, as a fuel.  
Here are three possible advantages of using hydrogen instead of petrol.
- 1 No energy is required to produce the hydrogen.
  - 2 The only product of combustion is water.
  - 3 Waste products are not released into the atmosphere.
- Which of these are correct advantages?
- A** 1 only
  - B** 2 only
  - C** 1 and 2 only
  - D** 2 and 3 only
- 39.** Industrially, oxygen is separated from air.  
The process works because
- A** oxygen is more reactive than nitrogen
  - B** there is less oxygen than nitrogen in air
  - C** oxygen boils at a different temperature from nitrogen
  - D** oxygen is more soluble in water than nitrogen

40. This headline appeared in a newspaper in November 2006.

### Global warming is ‘not a proven fact’

The article claimed that the link between carbon dioxide emissions from burning fossil fuels and global warming has not been proved.

On the same page was a separate report saying that the British government had agreed to cut carbon dioxide emissions by 13% over the next five years.

Here are two possible reasons for the government’s actions.

- 1 The direct link between carbon dioxide emissions from burning fossil fuels and global warming is scientifically proved.
- 2 Reducing carbon dioxide emissions is a precaution that some governments are taking in case these emissions are contributing to global warming.

Which of these reasons are correct?

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

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**TOTAL FOR HIGHER TIER PAPER: 24 MARKS**

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