

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 6 March 2009 – 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.

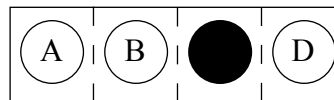
**Before the test begins:**

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.**

### **Barbecues**

Charcoal is used as a fuel for some barbecues.



1. Fuels are used because they produce
  - A smoke
  - B soot
  - C waste
  - D heat energy
  
2. Charcoal is made from wood obtained from trees.  
This means that it is
  - A dangerous
  - B a bio-fuel
  - C toxic
  - D a fossil fuel
  
3. The wood for making charcoal is often obtained from sustainable forests.  
In a sustainable forest
  - A no trees are cut down
  - B when trees are cut down no new trees are planted
  - C new trees are grown to replace trees that have been cut down
  - D all animals and birds are kept out
  
4. The charcoal on barbecues is often lit using 'lighting fluid'.  
Lighting fluid contains hydrocarbons.  
Hydrocarbons
  - A are all liquids at room temperature
  - B are a mixture of carbon and hydrogen
  - C are compounds of carbon and hydrogen only
  - D produce soot during complete combustion

5. At some barbecues people drink wine.  
The alcohol in wine is mainly
- A propanol
  - B ethanol
  - C ethanoic acid
  - D propane
6. The production of wine involves
- A fermentation and distillation
  - B distillation
  - C fermentation
  - D neither fermentation nor distillation
7. The process in which sugars are converted into alcohol is carried out at a temperature of about
- A 0°C
  - B 30°C
  - C 70°C
  - D 100°C
8. Drinking wine can cause
- A faster reactions
  - B clearer vision
  - C better judgement
  - D slurred speech
9. After the barbecue, the empty glass wine bottles are recycled.  
The main raw material for making glass is sand.  
It is important to recycle glass because
- A sand is a very expensive material
  - B glass cannot be put in landfill sites
  - C making glass from raw materials uses large amounts of energy
  - D glass decomposes to produce methane
10. Gloves can be made suitable for use when barbecuing by using Nomex fibres to make them.  
The most likely reason for using Nomex is that these fibres
- A are fireproof
  - B are breathable
  - C keep the hands warm
  - D make the gloves stiff

11. Some of the food is cooked on a baking tray coated with Teflon. The Teflon is used because it
- A reflects heat
  - B is a naturally occurring material
  - C prevents the food from sticking to the baking tray
  - D improves the flavour of the food

**Jane's new car**



Jane's new car can use liquefied petroleum gas (LPG) as a fuel. This fuel is a mixture of hydrocarbons obtained from crude oil.

12. The complete combustion of LPG will produce
- A carbon dioxide and water
  - B carbon and carbon dioxide
  - C carbon dioxide only
  - D water only

Use the following information to answer questions 13 and 14.

These four fuels are often described as 'alternative' fuels

LPG  
bio-diesel,  
hydrogen  
E85 (a fuel containing 85% bio-ethanol and 15% petrol)

13. Which of these statements is correct?

- A LPG is a bio-fuel
- B The raw material for bio-diesel is crude oil
- C Crude oil is not needed to produce E85
- D Large areas of fertile land are needed to produce large quantities of E85

14. Crude oil is used to produce a material used for road surfaces.  
Which row of the table shows the name of this material and the process used to obtain it?

	<b>name of material</b>	<b>process used</b>
<b>A</b>	naptha	fractional distillation
<b>B</b>	bitumen	fractional distillation
<b>C</b>	naptha	cracking
<b>D</b>	bitumen	cracking

15. A disadvantage of using hydrogen as a fuel is

- A burning it causes pollution
- B raw materials to make it are in short supply
- C it is difficult to ignite
- D making hydrogen needs large amounts of energy

16. Scotchgard protects fabrics from becoming stained.  
It was discovered by scientists when a liquid they were using to make a type of rubber was splashed onto some canvas shoes.  
They found that the part of the shoes on which the liquid was spilt resisted staining.

Scotchgard was discovered because scientists

- A were trying to make a fabric protector
- B ignored the accident
- C knew the liquid had these unusual properties
- D were observant after the liquid was spilt

**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**

### **Materials from the Earth**

- 17.** Many people add common salt to food.  
Common salt is
- A** sodium hydroxide
  - B** sodium hydrogencarbonate
  - C** sodium chloride
  - D** sodium chlorate
- 18.** Common salt can be obtained from
- A** sea water and rock salt
  - B** sea water only
  - C** rock salt only
  - D** neither sea water nor rock salt
- 19.** Nitrogen can be obtained from liquid air.  
The process involves
- A** a chemical reaction
  - B** nanotechnology
  - C** fractional distillation
  - D** a high temperature
- 20.** Nitrogen is put in some packets containing food.  
It is used because it
- A** is smart
  - B** is intelligent
  - C** is inert
  - D** has a high boiling point

## Protection from the weather

*Use the following information to answer questions 21 and 22.*

John investigated three different fabrics used to make trousers for outdoor activities.

21. To find out how hardwearing each fabric was, he rubbed a sample of each fabric on sandpaper.  
To ensure a fair test he should rub each sample
- A on the same piece of sandpaper for the same number of times
  - B on a different type of sandpaper for the same number of times
  - C on a new piece of sandpaper of the same type for a different number of times
  - D on a new piece of sandpaper of the same type for the same number of times
22. Which of these cannot be measured in a meaningful, scientific experiment?
- A which fabric is most waterproof
  - B which fabric is the strongest
  - C which fabric is the lightest in mass
  - D which fabric is the best for outdoor use
23. Gore-tex is used to make outdoor jackets which keep the people wearing them dry but allow their sweat to escape.
- Gore-tex is a
- A waterproof coating applied to the inside of the jacket
  - B waterproof coating applied to the outside of the jacket
  - C membrane containing small holes
  - D fibre that strengthens the jacket
24. A new sun-protection product that is completely transparent has been made.  
This product
- A does not reflect or absorb UV radiation
  - B does not reflect visible light
  - C forms a white deposit on the skin
  - D is unlikely to contain nanoparticles

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**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.**

**Possible health hazards**

CORGI is an organisation that advises on safety in the gas industry.  
CORGI lists the following as danger signs with gas appliances.

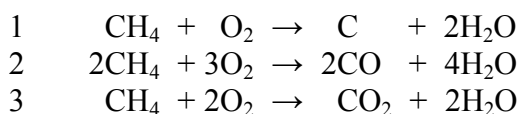
- soot on or around the appliance
- a yellow or orange flame
- condensation in the room

25. The formation of soot shows that

- A carbon is being produced by incomplete combustion
- B carbon monoxide is being produced by incomplete combustion
- C carbon is being produced by complete combustion
- D carbon dioxide is being produced by complete combustion

26. Natural gas contains methane, CH<sub>4</sub>.

Which of these equations show reactions that involve the incomplete combustion of methane?



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

27. Condensation in a room containing a gas central heating boiler suggests that

- A carbon dioxide is being formed
- B carbon monoxide is being formed
- C the fumes from the burning gas are leaking into the room
- D the supply of oxygen is insufficient

28. Carbon monoxide is toxic to humans because it

- A pollutes the atmosphere
- B is acidic
- C is absorbed through the skin
- D combines with haemoglobin in the blood



29. Nanotechnology is used to produce very small particles called nanoparticles. Nanoparticles of a given substance often have different properties from larger particles of the same substance.

Which of these statements are correct?

- 1 nano-sized particles existed before scientists started to make them using nanotechnology
- 2 scientists fully understand the risks involved in the use of nanotechnology

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

### Chemistry and health

30. Nitinol is a shape memory alloy. Shape memory alloys can be squashed but when they are warmed they return to their original shape. Nitinol is combined with a polyester to form a tube that is used to hold open blocked veins and arteries. The Nitinol is squashed to allow the tube to be put in place. When the Nitinol is warmed by the body it returns to its original shape holding the polyester tube open. Body heat does not affect the polyester.



Which row of the table describes nitinol and polyester?

	<b>nitinol</b>	<b>polyester</b>
<b>A</b>	smart	smart
<b>B</b>	smart	not smart
<b>C</b>	not smart	smart
<b>D</b>	not smart	not smart

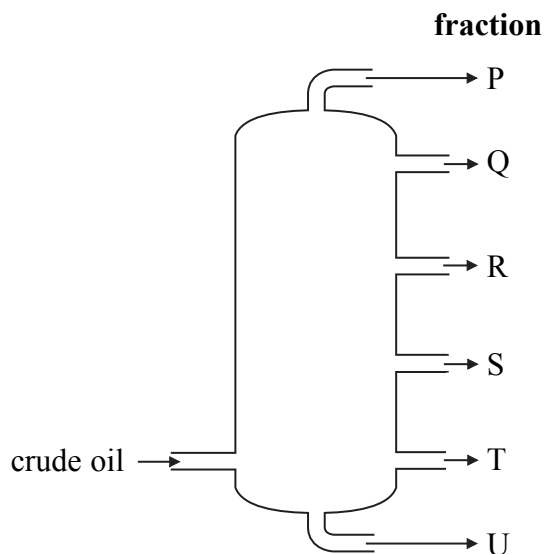
- 31.** Decayed food can cause illness.  
Scientists have developed a food-wrapping material that will remove a gas from the contents of the package.  
The gas which must be removed to prevent the food decaying is
- A** nitrogen
  - B** oxygen
  - C** argon
  - D** carbon monoxide
- 32.** Some wound dressings have a hydrophilic adhesive.  
This means that when a dressing is stuck on the skin
- A** the skin must be dry because the hydrophilic adhesive repels water
  - B** moisture on the skin is not a problem because the hydrophilic adhesive repels moisture
  - C** the skin must be dry because the hydrophilic adhesive attracts water
  - D** moisture on the skin is not a problem because the hydrophilic adhesive attracts moisture
- 33.** Here are three statements about the effect of ethanol on the human body.
- 1 a small amount of ethanol has no effect at all on the human body
  - 2 alcoholic drinks can make a person more self-confident and daring
  - 3 large amounts of ethanol in the blood can lead to coma and death
- Which of these statements are correct?
- A** 1 and 2 only
  - B** 1 and 3 only
  - C** 2 and 3 only
  - D** 1, 2 and 3

## Fuels

34. Ethanol is used as a fuel in some countries.  
Which of these statements are correct?
- 1 growing crops to produce ethanol reduces the land available for food production
  - 2 growing plants use carbon dioxide
  - 3 burning ethanol produces carbon dioxide
- A 1 only  
B 1 and 2 only  
C 2 and 3 only  
D 1, 2 and 3
35. Hydrogen can be used as a fuel.  
Which is the balanced equation for burning hydrogen in air?
- A  $\text{H}_2 + \text{O}_2 \rightarrow \text{H}_2\text{O}_2$   
B  $\text{H}_2 + \text{O} \rightarrow \text{H}_2\text{O}$   
C  $\text{H}_2 + \text{O}_2 \rightarrow \text{H}_2\text{O} + \text{O}$   
D  $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$
36. Two fuels that can be used for cars are petrol and diesel.  
Which of the following statements is **false**?
- A the waste products produced during complete combustion are the same for both fuels.  
B loss of diesel from the fuel tank by evaporation in warm weather would be greater than for petrol  
C diesel is more likely to solidify in very cold weather than petrol  
D diesel is more difficult to ignite than petrol
37. Some cars use autogas as a fuel.  
Autogas is liquefied petroleum gas (LPG). It is mainly a mixture of propane and butane.  
Which of these is the balanced equation for the complete combustion of butane?
- A  $\text{C}_4\text{H}_{10} + 9\text{O}_2 \rightarrow 4\text{CO}_2 + 5\text{H}_2\text{O}$   
B  $2\text{C}_4\text{H}_{10} + 9\text{O}_2 \rightarrow 8\text{CO} + 10\text{H}_2\text{O}$   
C  $2\text{C}_4\text{H}_{10} + 13\text{O}_2 \rightarrow 8\text{CO}_2 + 10\text{H}_2\text{O}$   
D  $\text{C}_4\text{H}_{10} + 6\text{O}_2 \rightarrow 3\text{CO}_2 + \text{CO} + 5\text{H}_2\text{O}$

Use the following information to answer questions 38 to 40.

The diagram shows a fractionating column used to obtain useful products from crude oil.



38. Which of these statements are correct?

- 1 Crude oil enters the bottom of the tower as a liquid
- 2 Each fraction contains only one compound

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

39. Comparing fraction Q with fraction P, which row of the table is correct?

	average length of carbon chain in molecules of Q	boiling point of Q	viscosity of Q
<b>A</b>	shorter than P	lower than P	greater than P
<b>B</b>	longer than P	higher than P	greater than P
<b>C</b>	shorter than P	lower than P	less than P
<b>D</b>	longer than P	higher than P	less than P

40. Which row of the table correctly identifies R, S and T?

	<b>R</b>	<b>S</b>	<b>T</b>
<b>A</b>	kerosene	fuel oil	diesel oil
<b>B</b>	fuel oil	diesel oil	kerosene
<b>C</b>	diesel oil	kerosene	fuel oil
<b>D</b>	kerosene	diesel oil	fuel oil

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

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