

Surname	Initial(s)
Signature	

Paper Reference(s)

5008 5036

Edexcel GCSE Science (5008) Chemistry (5036)

C1b – Topics 7 and 8

Foundation and Higher Tier

Monday 12 November 2012 – 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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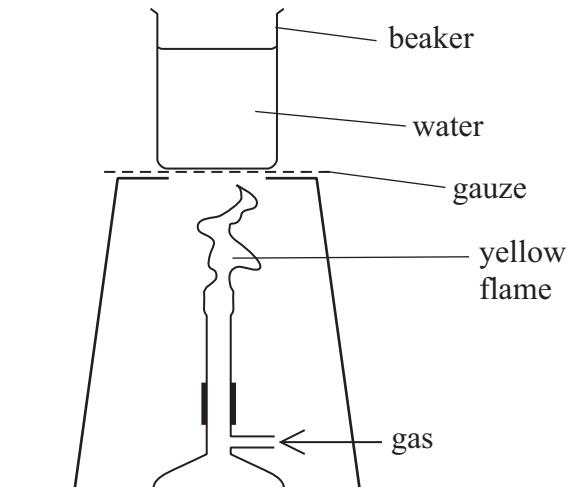
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**Questions 1 to 16 must be answered by Foundation tier candidates only.
Higher tier candidates start at question 17.**

Fuels

1. Suzie used a yellow Bunsen burner flame to heat a beaker of water.



A black deposit of soot (carbon) formed on the gauze and on the bottom of the beaker. This black deposit was produced from the gas by

- A** complete combustion
- B** incomplete combustion
- C** fermentation
- D** desalination

2. One of the fractions produced by the fractional distillation of crude oil is

- A** petrol
- B** ethanol
- C** bio-diesel
- D** hydrogen

3. Crude oil is a mixture of

- A** carbon and hydrogen
- B** compounds of carbon and hydrogen
- C** carbon and oxygen
- D** compounds of carbon and oxygen

4. When butane burns it reacts with a gas in the air.
This gas is

- A carbon dioxide
- B nitrogen
- C hydrogen
- D oxygen

5. Kerosene is used as a fuel for



motor bikes



cars



aeroplanes



vans

A

B

C

D

6. Natural gas is burnt in central heating boilers.
A good supply of air is needed for this process to prevent

- A condensation occurring
- B the temperature becoming too hot
- C the formation of carbon monoxide
- D the formation of carbon dioxide

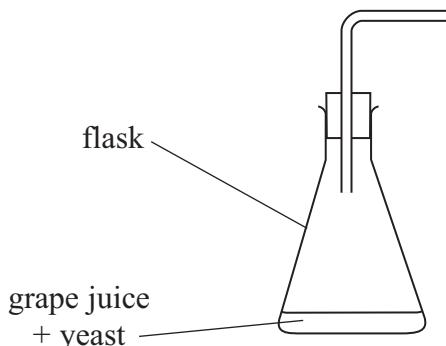
7. Hydrogen is sometimes used as a fuel.
An advantage of using hydrogen as a fuel, rather than petrol, is

- A plentiful supplies of hydrogen are available from liquid air
- B it does not need oxygen to burn
- C when mixed with air and ignited it does not explode
- D the only waste product is water

Alcoholic drinks

Use the following information to answer questions 8 and 9.

This apparatus was set up.



Yeast caused sugar in the grape juice to form ethanol and carbon dioxide.

8. The process taking place in the flask is

- A fermentation
- B distillation
- C neutralisation
- D desalination

9. A drink made using this process is

- A orange juice
- B wine
- C tea
- D lemonade

10. Drinking alcoholic drinks can cause

- A antisocial behaviour
- B improved vision
- C faster reactions
- D clearer thinking

11. Some alcoholic drinks are supplied in aluminium cans.

It is important to recycle the aluminium from these cans because

- A recycling conserves natural resources
- B recycling allows these used cans to be refilled
- C aluminium is a very rare metal
- D aluminium in landfill sites will quickly dissolve in water and pollute it

Useful substances

- 12.** Natural gas is mainly methane, CH₄.

Methane is a

- A** solid at room temperature
- B** liquid at room temperature
- C** mixture of carbon and hydrogen
- D** hydrocarbon

- 13.** Lightweight tents often have poles that are reinforced with fibres.

Which of these fibres is likely to be used to make poles which are part of a lightweight tent?

- A** fibres that are strong and dense
- B** fibres that provide good thermal insulation
- C** fibres that are strong and light
- D** fibres that are flame resistant

Use the following information to answer questions 14 and 15.

The table shows some properties of four materials.

material	properties
Thinsulate	good insulator but not waterproof
Sympatex	breathable and waterproof
carbon fibres	strong and light
Teflon	hard-wearing and very slippery

14. Which of these materials is likely to be used as a coating for skis?

- A** Thinsulate
- B** Sympatex
- C** carbon fibres
- D** Teflon

15. Kenny wears a hat made of Thinsulate.



This hat made of Thinsulate will be most beneficial to Kenny when the weather is

- A** wet
- B** dry
- C** warm
- D** cold

16. Gore-Tex is used in some outdoor coats.

Gore-Tex is used to

- A** stop rain entering the coat and prevent water vapour from the body escaping
- B** stop rain entering the coat and allow water vapour from the body to escape
- C** allow rain to enter the coat but prevent water vapour from the body escaping
- D** allow rain to enter the coat and allow water vapour from the body to escape

**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 environment

17. Which row of the table contains two fuels that produce both carbon dioxide and water when each of them is burnt completely in air?

fuels		
A	carbon	hydrogen
B	ethanol	carbon
C	kerosene	petrol
D	hydrogen	diesel oil

18. Which of these processes does **not** involve a chemical reaction?

- A incomplete combustion
- B fractional distillation
- C fermentation
- D complete combustion

19. Wood, obtained from trees, has many important uses.

Some wood suppliers claim that their wood is obtained from sustainable forests.

A sustainable forest is a forest in which

- A all trees are cut down when small to allow flowers to develop
- B trees are cut down to make space for wind turbines
- C trees are only cut down in winter when no birds are nesting
- D new trees are planted to replace those cut down

20. In some countries drinking water is obtained from sea water.

The process used

- A is combustion
- B is desalination
- C always involves nanotechnology
- D removes salt by filtration

Useful materials

- 21.** Some bullet proof vests are made of a material containing Kevlar.
The main reason for using Kevlar is because it
- A** is a natural material
 - B** gives the vest a smart appearance
 - C** is flexible and transparent
 - D** is strong and has a low density
- 22.** Chemists research and develop new materials.
These materials
- A** sometimes have unusual properties that were not expected
 - B** are always suitable for their intended use
 - C** are only ever used for one specific purpose
 - D** are always better than naturally occurring materials
- 23.** Crisps are often sold in packets that contain nitrogen.
Nitrogen is used to replace air in the packets because it
- A** prevents carbon dioxide reacting with the plastic packet
 - B** prevents oxygen reacting with the plastic packet
 - C** prevents carbon dioxide reacting with the fat in the crisps
 - D** prevents oxygen reacting with the fat in the crisps
- 24.** On an industrial scale, nitrogen is obtained from air by
- A** reacting the air with copper to remove oxygen
 - B** fractional distillation of liquid air
 - C** freezing the air and removing solid nitrogen
 - D** adding nanoparticles to the air

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.**

Materials old and new

25. Mayonnaise is an emulsion that can be made using egg yolks, oil and vinegar.
In this mixture the

- A oil acts as a preservative
- B egg yolks act as a preservative
- C egg yolks prevent the oil and vinegar separating
- D oil prevents the egg yolks and vinegar separating

26. The metal frame of these spectacles is made of a shape memory alloy.
The frame regains its original shape after being bent.
The lenses of the spectacles darken in bright light.



Which row of the table describes the materials used for the frame and lenses?

	material used for the	
	frame	lenses
A	not smart	smart
B	not smart	not smart
C	smart	smart
D	smart	not smart

27. In some houses, windows are made of glass coated with a thin layer of titanium(IV) oxide nanoparticles, to make the glass self-cleaning.

Which of these statements about the coating are correct?

- 1 the nanoparticles of titanium(IV) oxide are smaller than conventional particles of solid titanium(IV) oxide
- 2 the coating will reflect all light

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

28. Some waterproof clothing contains a membrane with microscopic pores. The membrane makes the clothing breathable and waterproof.

The microscopic pores in the membrane must be

- A larger than water droplets and larger than water molecules
- B smaller than water droplets but larger than water molecules
- C smaller than water droplets and smaller than water molecules
- D larger than water droplets but smaller than water molecules

29. Whisky is an alcoholic drink.

One stage in the manufacture of whisky involves adding yeast to a substance called ‘wort’. In this stage the alcohol is produced.

Which row of the table shows two substances that must be in ‘wort’ before the yeast is added?

substances in ‘wort’		
A	ethanol	sugar
B	sugar	water
C	water	carbon dioxide
D	carbon dioxide	ethanol

30. Which of these is the balanced equation for a reaction that takes place when ethanol is produced by fermentation?

- A $\text{C}_5\text{H}_{12}\text{O}_4 \rightarrow 2\text{C}_2\text{H}_5\text{OH} + \text{CO}_2$
- B $\text{C}_2\text{H}_4 + \text{H}_2\text{O} \rightarrow \text{C}_2\text{H}_5\text{OH}$
- C $\text{C}_6\text{H}_{12}\text{O}_6 \rightarrow 2\text{C}_2\text{H}_5\text{OH} + 2\text{CO}_2$
- D $\text{C}_6\text{H}_{12}\text{O}_6 \rightarrow 2\text{C}_2\text{H}_4\text{OH} + \text{CO}_2 + \text{H}_2\text{O}$

31. Ethanol is used as a fuel in some countries.

It is produced from crops.

Which of these statements are correct?

- 1 large amounts of land are required to grow the crops that are used to produce ethanol
- 2 when ethanol is burnt no carbon dioxide is released into the atmosphere

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

- 32.** Chlorine and hydrogen are both elements that have important industrial uses.
Each row in the table shows the raw material from which one of these elements is made and a use of this element.

Which row of the table is correct?

	element	raw material	use
A	chlorine	liquid air	as a bleach
B	chlorine	rock salt	as a fertiliser
C	hydrogen	liquid air	as a fuel
D	hydrogen	rock salt	making hydrochloric acid

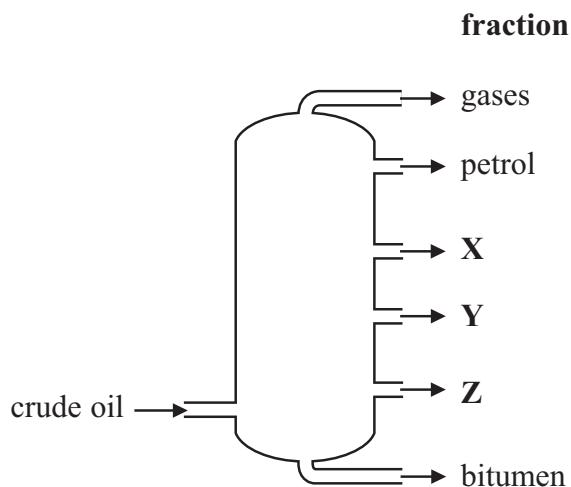
Crude oil

Use the following information to answer questions 33 to 37.

Crude oil is separated into useful fractions by fractional distillation.

The diagram shows a fractionating column and the fractions obtained from it.

Three of the fractions are not named but labelled **X**, **Y** and **Z**.



33. The fractions can be separated in this way because the crude oil contains liquids with different

- A** uses
- B** densities
- C** boiling points
- D** melting points

34. Which of these statements about fractional distillation are correct?

- 1 crude oil enters the tower as a liquid
- 2 each fraction is a pure substance

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

35. Which row of the table correctly identifies fractions **X**, **Y** and **Z**?

	fraction X	fraction Y	fraction Z
A	diesel oil	fuel oil	kerosene
B	kerosene	fuel oil	diesel oil
C	fuel oil	kerosene	diesel oil
D	kerosene	diesel oil	fuel oil

36. Which row of the table correctly compares the viscosity and ease of ignition of fraction X with these properties of fraction Y?

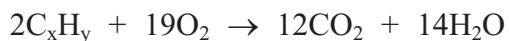
	viscosity of fraction X	ease of ignition of fraction X
A	lower than fraction Y	easier than fraction Y
B	higher than fraction Y	harder than fraction Y
C	lower than fraction Y	harder than fraction Y
D	higher than fraction Y	easier than fraction Y

37. Two fractions obtained from crude oil are kerosene and fuel oil.
Which row of the table shows a correct use of both fractions?

	kerosene is used as a fuel in	fuel oil is used as a fuel in
A	central heating boilers	lorries
B	car engines	central heating boilers
C	jet engines	lorries
D	central heating boilers	ships

Using fuels

38. This equation represents the combustion of a hydrocarbon C_xH_y .



The formula of the hydrocarbon is

- A C_6H_{14}
- B C_6H_{28}
- C $C_{12}H_{14}$
- D $C_{12}H_{28}$

39. Carbon monoxide is a toxic gas found in car exhaust fumes.

Which of these statements about carbon monoxide are correct?

- 1 carbon monoxide is toxic because it combines with haemoglobin in the blood
- 2 carbon monoxide is toxic because it is colourless and odourless

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

40. Some buses and taxis in London use hydrogen as a fuel.

Which of these statements about using hydrogen as a fuel are correct?

- 1 energy is not required to produce hydrogen
- 2 no waste product is released into the atmosphere when hydrogen is used as a fuel

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

TOTAL FOR HIGHER TIER PAPER: 24 MARKS

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