

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 12 November 2010 – 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

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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. Many fuels are produced from crude oil.
Crude oil is
 - A an element
 - B a mixture
 - C a metal
 - D an alloy

2. Fuels are useful because, when they are burnt, they produce
 - A carbon dioxide
 - B heat energy
 - C water
 - D soot

3. When a substance burns in oxygen, the process is
 - A combustion
 - B hydration
 - C distillation
 - D desalination

4. Hydrocarbons contain
 - A carbon only
 - B hydrogen only
 - C carbon and hydrogen only
 - D carbon, hydrogen and oxygen

5. When hydrogen burns
 - A the product is water
 - B the product is carbon dioxide
 - C the product is carbon monoxide
 - D there is no product

6. Wood is a sustainable fuel because
 - A trees absorb carbon dioxide
 - B when wood is burnt, no gases are produced
 - C when trees are cut down and burned, new trees can be planted
 - D when wood is burnt, the only product is water

Alcoholic drinks

7. When beer is made, sugar is converted into alcohol. What is the name of this process?
- A fermentation
 - B combustion
 - C distillation
 - D desalination
8. Most of the alcohol in beer is
- A methane
 - B ethane
 - C methanol
 - D ethanol
9. Drinking too much of any alcoholic drink can cause
- A improved judgement
 - B slower reaction times
 - C increased awareness
 - D improved health
10. Drinks are often sold in cans made of aluminium. Why is it important that the aluminium is recycled?
- A aluminium is rare
 - B aluminium cannot be put into landfill sites
 - C recycling conserves aluminium ore
 - D recycling aluminium does not require any energy

Useful materials

Use the following information to answer questions 11 and 12.

The table lists two properties of four different materials.

material	property 1	property 2
A	light (low density)	stretchy
B	light (low density)	stiff
C	high melting point	slippery
D	high melting point	flexible

Each material may be used once, more than once, or not at all.

11. Which material would be most suitable for the non-stick coating on a frying pan?
12. Athletes wear clothing made of Lycra. Which material could be Lycra?
13. A new type of mug has been made which looks different when it is cold from when it is hot.



cold



hot

When it is cold, the mug is white.

When it is hot, a picture appears on the outside of the mug.

This is because part of the coating on the outside of the mug is

- A toxic
- B intelligent
- C breathable
- D smart

The atmosphere

14. It is thought that the Earth's early atmosphere came from volcanoes. Which gas was **not** present in this early atmosphere?

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

15. Most of the Earth's atmosphere today is

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

16. Liquid oxygen is obtained from liquid air. The process used is

- A combustion
- B fractional distillation
- C fermentation
- D desalination

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

Combustion and its effects

17. Carbon monoxide is a product of the incomplete combustion of a hydrocarbon.
Another product of the incomplete combustion of a hydrocarbon is
- A carbon dioxide
 - B oxygen
 - C carbon
 - D sulphur dioxide
18. Incomplete combustion of a hydrocarbon occurs because there is a shortage of
- A nitrogen
 - B carbon dioxide
 - C the hydrocarbon
 - D oxygen

Packaging

Some salads are sold pre-packed in bags.

19. Before packing, the salad is washed using water containing chlorine.
The reason for using chlorine in the water is to
- A remove dirt
 - B kill bacteria
 - C make the salad fresher
 - D bleach the salad
20. The symbol for an atom of chlorine is
- A CL
 - B CL₂
 - C Cl
 - D Cl₂
21. The bags of salad are filled with nitrogen gas before they are sealed.
The nitrogen stops the salad deteriorating by preventing the reaction between the salad and
- A carbon dioxide
 - B water
 - C argon
 - D oxygen

22. Industrially, nitrogen and oxygen are obtained from liquid air. This process works because
- A there is more nitrogen in the air than oxygen
 - B nitrogen is more reactive than oxygen
 - C liquid nitrogen and liquid oxygen have different boiling points
 - D nitrogen and oxygen are the only gases in the air
23. Some salad dressings are a mixture of oil and vinegar and a substance used to stop the oil and vinegar separating. The salad dressing is
- A a pure liquid
 - B a suspension
 - C a solution
 - D an emulsion
24. A particle of the substance used to stop the oil and vinegar separating has a hydrophilic and a hydrophobic part.

Which row of the table shows the correct meaning of hydrophilic and hydrophobic?

	hydrophilic	hydrophobic
A	repelled by water	attracted to water
B	attracted to water	repelled by water
C	repelled by water	repelled by water
D	attracted to water	attracted to water

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.**

New materials

Nanoparticles of zinc oxide are used in some sunscreens.

25. Which of the following statements about nanotechnology are correct?

- 1 nanoparticles are smaller than individual atoms
- 2 the risks involved in the use of nanotechnology are fully understood

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

26. Nanoparticles rather than conventional-sized particles of zinc oxide are used in some sunscreens.

These nanoparticles are used because they

- A** are not transparent to visible light
- B** are able to be seen on the skin because they reflect visible light
- C** reflect ultraviolet light
- D** form an oily layer on the surface of the skin

27. This label is stitched inside a jacket which has a Gore-tex lining.



Gore-tex is waterproof and breathable.

Which of the statements about the pores in Gore-tex are correct?

- 1 the pores are larger than molecules in the water vapour
- 2 the pores are smaller than drops of water

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

Methane

28. Methane burns in a Bunsen burner flame.
Which of the following statements about the combustion of methane are correct?
- 1 when complete combustion occurs, methane burns with a yellow, sooty flame
 - 2 when methane burns in excess oxygen, incomplete combustion occurs
- A 1 only
B 2 only
C both 1 and 2
D neither 1 nor 2
29. Which is the equation for the complete combustion of methane?
- A $\text{CH}_4 + 4\text{O} \rightarrow \text{CO}_2 + 2\text{H}_2\text{O}$
B $\text{CH}_4 + 2\text{O}_2 \rightarrow \text{CO}_2 + 2\text{H}_2\text{O}$
C $2\text{CH}_4 + 3\text{O}_2 \rightarrow 2\text{CO} + 4\text{H}_2\text{O}$
D $\text{CH}_4 + 3\text{O} \rightarrow \text{CO} + 2\text{H}_2\text{O}$
30. Which of the statements about carbon monoxide are correct?
- 1 carbon monoxide is toxic because it reduces the amount of oxygen that the blood can carry
 - 2 carbon monoxide can be produced by faulty gas appliances
- A 1 only
B 2 only
C both 1 and 2
D neither 1 nor 2

Sodium chloride

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

	sodium chloride is used	sodium hydroxide is used
A	as a food preservative	as a food flavouring
B	in oven cleaners	in oven cleaners
C	as a food preservative	in oven cleaners
D	in oven cleaners	as a food preservative

32. Which of these is **not** obtained from seawater on an industrial scale?

- A** hydrogen
- B** sodium hydroxide
- C** oxygen
- D** chlorine

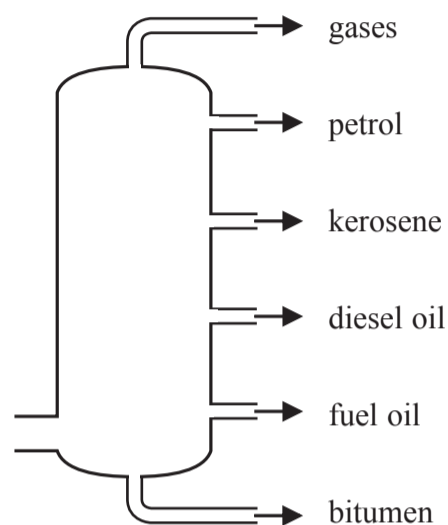
Fuels

33. Crude oil is separated into fractions by fractional distillation. Which row shows the steps of the process in the correct order?

	first step → last step			
A	crude oil is vaporised	vapour cools	vapour passes into column	liquid fraction forms
B	vapour passes into column	vapour cools	crude oil is vaporised	liquid fraction forms
C	crude oil is vaporised	vapour passes into column	vapour cools	liquid fraction forms
D	vapour passes into column	vapour cools	liquid fraction forms	crude oil is vaporised

Use the following information to help you answer questions 34 and 35.

The diagram shows the fractions obtained from crude oil on a fractionating column.



34. The table compares the boiling points and the average length of carbon chains in the molecules, in diesel oil with those in petrol. Which row of the table is correct?

	boiling point of diesel oil is	average length of carbon chains in molecules in diesel oil is
A	lower than petrol	shorter than petrol
B	lower than petrol	longer than petrol
C	higher than petrol	longer than petrol
D	higher than petrol	shorter than petrol

35. The table shows some uses of kerosene, fuel oil and bitumen. Which row of the table is correct?

	use of kerosene	use of fuel oil	use of bitumen
A	fuel for ships	jet engine fuel	road surfaces
B	jet engine fuel	fuel for ships	road surfaces
C	road surfaces	jet engine fuel	fuel for ships
D	jet engine fuel	road surfaces	fuel for ships

- 36.** Bio-ethanol can be used as an alternative to petrol.
Crops must be grown to produce bio-ethanol.
Which row of the table shows an advantage and a disadvantage of using bio-ethanol instead of petrol?

	advantage of bio-ethanol	disadvantage of bio-ethanol
A	does not form carbon dioxide when burnt	growing the crops removes carbon dioxide from the air
B	growing the crops removes carbon dioxide from the air	growing the crops requires large areas of land
C	does not form carbon dioxide when burnt	growing the crops requires large areas of land
D	growing the crops removes carbon dioxide from the air	does not form carbon dioxide when burnt

- 37.** Hydrogen can be used as a fuel for cars.
Which of the statements about the use of hydrogen as a fuel for cars are correct?

- 1 strong, heavy tanks have to be used to store the hydrogen
- 2 large amounts of energy are required to make hydrogen

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

Ethanol

Sugar, in the presence of yeast, is converted to ethanol.

38. Which is the balanced equation for this reaction?

- A $C_6H_{12}O_6 + \text{yeast} \longrightarrow 2C_2H_5OH + 2CO_2$
- B $C_6H_{12}O_6 + 3O_2 + \text{yeast} \longrightarrow C_2H_5OH + 3H_2O + 4CO_2$
- C $C_6H_{12}O_6 + 3O_2 \xrightarrow{\text{yeast}} C_2H_5OH + 3H_2O + 4CO_2$
- D $C_6H_{12}O_6 \xrightarrow{\text{yeast}} 2C_2H_5OH + 2CO_2$

39. Which of the statements about fermentation are correct?

- 1 the ideal temperature for fermentation is 70°C
- 2 when sugar from grapes is fermented, the alcoholic drink formed is always beer

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

40. Which of the statements about the effects of ethanol on the body are correct?

- 1 ethanol in the body can cause quicker reaction times
- 2 ethanol in the body can cause permanent damage to the body

- 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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