

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 20 November 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.

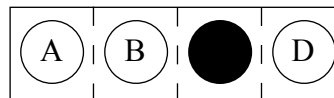
Before the test begins:

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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**Questions 1 to 16 must be answered by Foundation tier candidates only.
Higher tier candidates start at question 17.**

Modern materials

1. Tom works as a lumberjack and uses a chain saw to cut down trees. He wears protective trousers to prevent injury from the chain saw. Which row of the table shows two important properties of a suitable material for these trousers?

	resistance to tearing	flexibility of material
A	high	flexible
B	low	rigid
C	low	flexible
D	high	rigid

2. In cold weather, Tom wears a hat. To keep his head warm, the material of the hat must

- A** trap air
- B** have high tensile strength
- C** be porous
- D** be breathable

3. Tom wears a jacket made of Gore-Tex fabric. All Gore-Tex fabric has

- A** a waterproof inner coating
- B** a breathable membrane
- C** a layer of nanoparticles of poly(ethene)
- D** a high visibility outer coating

4. The frames of Tom's spectacles are made from a shape memory alloy. If the frames are bent, they return to their original shape when warm. The material used to make the frames

- A** must have a low melting point
- B** must have low tensile strength
- C** is smart
- D** is brittle

Alcoholic drinks

The NHS (National Health Service) has published information about these alcoholic drinks.



	A	B	C	D
alcoholic drink	cider	rum and coke	sambuca	wine
volume of drink (cm ³)	275	200	25	175
alcohol in drink (%)	5.5	10	42	13
units of alcohol in drink	1.5	2.0	1.1	2.3

1.0 unit of alcohol is 10 cm³ of the pure alcohol.

5. Which glass contains the largest amount of the alcohol?
6. The alcohol in alcoholic drinks is
- A ethene
 - B propanol
 - C ethanol
 - D propane
7. The NHS has published this information because
- A drinking large amounts of the alcohol can damage your health
 - B drinking large amounts of the alcohol is good for relieving stress
 - C drinking the alcohol makes you more alert
 - D drinking the alcohol helps to prevent infections
8. Wine is made from grape juice.
The process used is
- A distillation
 - B hydration
 - C dehydration
 - D fermentation

Global warming

The idea that the Earth is becoming warmer is known as global warming.

9. Global warming
- A is an idea that is not supported by any evidence
 - B is now a widely accepted idea
 - C can only be caused by carbon dioxide in the atmosphere
 - D can be prevented by cutting down trees
10. Burning fossil fuels may cause global warming because
- A smoke escapes into the atmosphere
 - B carbon dioxide is formed
 - C methane is formed
 - D fossil fuels are non-renewable
11. When making predictions about future warming of the Earth, scientists
- A monitor earthquakes and make predictions which are uncertain
 - B monitor earthquakes and make predictions which are certain to happen
 - C use computer models and make predictions which are uncertain
 - D use computer models and make predictions which are certain to happen
12. Which of these websites is most likely to provide unbiased information about global warming?
- A the 'convert to hydrogen fuel' website
 - B a national weather centre website
 - C the 'fly with us' airline website
 - D the 'bio-fuels are great' website

Useful substances

13. Which of these is added to water supplies to kill bacteria?
- A sodium chloride
 - B sodium hydroxide
 - C chlorine
 - D sodium
14. Which of these is **not** obtained from rock salt?
- A calcium oxide
 - B sodium chloride
 - C sodium hydroxide
 - D chlorine
15. Which of these is obtained, in large volume, from liquid air?
- A hydrogen
 - B oxygen
 - C carbon dioxide
 - D water
16. Methane is a useful fuel.
When it burns completely in air it produces heat and
- A a yellow flame
 - B soot
 - C a solid residue
 - D waste gases

**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**

Food

17. On some packets of salted nuts it states that the packet contains nitrogen gas.
This gas is in the packet to prevent

- A carbon dioxide reacting with oil in the nuts
- B carbon dioxide reacting with salt on the nuts
- C oxygen reacting with oil in the nuts
- D oxygen reacting with salt on the nuts

18. The nitrogen can be obtained from liquid air by

- A dehydration
- B using nanotechnology
- C chemical reaction
- D fractional distillation

19. Some food products are emulsions.
An emulsion is a mixture of

- A a gas and a liquid
- B a liquid and a solid
- C two solids
- D two liquids

20. Emulsifiers have a hydrophilic part and a hydrophobic part.
Which row of the table describes both parts correctly?

	hydrophilic part is	hydrophobic part is
A	water loving	water hating
B	water hating	water loving
C	water hating	water hating
D	water loving	water loving

21. Food is often sold in paper bags.
Paper is made from wood.
It is important to recycle paper because

- A paper is not biodegradable
- B paper is made from non-renewable materials
- C recycling paper saves resources
- D recycled paper is of better quality than that made from new raw materials

Propane

Some stoves use propane, C_3H_8 , as a fuel.

22. Incomplete combustion of propane can cause the formation of carbon monoxide. Which of these is also a product of the incomplete combustion of propane?
- A oxides of nitrogen
 - B sulphur dioxide
 - C carbon
 - D carbon dioxide
23. Carbon monoxide is dangerous because it
- A forms choking fumes
 - B is heavier than air
 - C combines with haemoglobin in the blood
 - D combines with oxygen in the blood
24. Which of these word equations shows all the products of the complete combustion of propane?
- A propane + oxygen \rightarrow carbon dioxide
 - B propane + oxygen \rightarrow carbon monoxide + water
 - C propane + oxygen \rightarrow carbon dioxide + hydrogen
 - D propane + oxygen \rightarrow carbon dioxide + 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.**

Scientific developments

25. This question is about bio-diesel.
Which of these statements is **not** correct?
- A burning bio-diesel causes no changes in the atmosphere
 - B the plants used to produce bio-diesel remove carbon dioxide from the atmosphere as they grow
 - C bio-diesel is a renewable fuel
 - D using bio-diesel reduces the demand for crude oil
26. A product has been developed which keeps the vegetable oil in deep fat fryers fresh for longer.
This product contains nanoparticles.
Nanoparticles are
- A smaller than protons
 - B smaller than electrons
 - C larger than atoms
 - D larger than 0.1 mm in diameter
27. Some people are concerned about the increased use of nanoparticles.
The most valid reason for these concerns is that
- A nanoparticles make copies of themselves
 - B the unusual properties of nanoparticles are not fully understood
 - C the nanoparticles are too small to see
 - D all nanoparticles are made by scientists

Sea water

28. In some hot countries, drinking water is obtained from sea water.
The process used is
- A hydration
 - B dehydration
 - C salination
 - D desalination

29. Sodium and chlorine can be obtained from sodium chloride.
Which row of the table shows correct uses for these two elements?

	sodium	chlorine
A	in street lights	making hydrochloric acid
B	in oven cleaners	as a food flavouring
C	in oven cleaners	making some polymers
D	in street lights	as a food flavouring

Useful materials

30. Ethanol obtained from plants is a bio-fuel.
Here are two statements about bio-fuels.
- 1 When ethanol is used as a fuel no carbon dioxide is released into the atmosphere
 - 2 The plants used to make bio-fuels are grown on land that is unsuitable for growing food crops

Which of these statements are correct?

- A** 1 only
B 2 only
C both 1 and 2
D neither 1 nor 2
31. A chemist was trying to make a strong adhesive.
He made an adhesive that allowed things to be separated easily after they had been stuck together.
This adhesive was
- A** never used because it was too weak
B put into immediate use to make Post-it notes
C developed into a weaker adhesive
D used to make Post-it notes a few years later

32. Some car air bags have a sensor made of a material which produces an electric current when it is deformed.
The current causes particles of solid sodium azide to decompose.
The nitrogen gas released in this reaction inflates the airbag.

Which row of the table describes the sensor material and the sodium azide?

	sensor material	sodium azide
A	smart	not smart
B	smart	smart
C	not smart	smart
D	not smart	not smart

Use the following information to answer questions 33 and 34.

Beer is made using malted barley.
Sugars from the malted barley are converted into ethanol by fermentation.

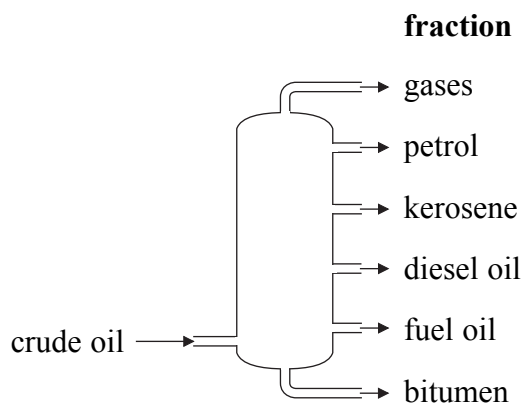
33. Here are two statements about the process.
- 1 Yeast is needed to convert the sugars into ethanol
 - 2 The process of producing ethanol works well at temperatures between 15°C and 27°C.

Which of these statements are correct?

- A** 1 only
B 2 only
C both 1 and 2
D neither 1 nor 2
34. Which of these is the balanced equation for a reaction that takes place when ethanol is produced by fermentation?
- A** $C_2H_4 + H_2O \rightarrow C_2H_5OH$
B $C_6H_{12}O_6 \rightarrow 2C_2H_4OH + CO_2 + H_2O$
C $C_6H_{12}O_6 \rightarrow 2C_2H_5OH + 2CO_2$
D $C_5H_{12}O_4 \rightarrow 2C_2H_5OH + CO_2$

Crude oil and fuels

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



35. Which of these statements is **not** correct?

- A each fraction contains a mixture of compounds
- B some molecules in the petrol fraction contain eight carbon atoms
- C petrol has a higher boiling point than diesel oil
- D kerosene ignites more easily than diesel oil

36. Which of these statements are correct?

- 1 Crude oil is vaporised before it enters the column
- 2 Crude oil is a compound containing many different hydrocarbons

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

37. The table shows two properties of fuel oil compared with the same properties of diesel oil. Which row of the table is correct?

	average length of carbon chain in molecules in fuel oil	viscosity of fuel oil at room temperature
A	shorter than diesel oil	lower than diesel oil
B	longer than diesel oil	higher than diesel oil
C	shorter than diesel oil	higher than diesel oil
D	longer than diesel oil	lower than diesel oil

38. The gases produced at the top of the column contain butane.
Which is the balanced equation for the complete combustion of butane?

- A $C_4H_{10} + 9O_2 \rightarrow 4CO_2 + 5H_2O$
B $C_4H_{10} + 6O_2 \rightarrow 3CO_2 + CO + 5H_2O$
C $2C_4H_{10} + 13O_2 \rightarrow 8CO_2 + 10H_2O$
D $C_4H_{10} + 13O \rightarrow 4CO_2 + 5H_2O$

39. The table shows some of the fractions with two suggested uses for each named fraction.
Which row of the table is correct?

	fraction	use 1	use 2
A	petrol	fuel for cars	fuel for patio heaters
B	kerosene	fuel for aircraft	painting fences
C	fuel oil	fuel for ships	fuel for trains
D	bitumen	road surfacing	waterproofing roofs

40. Some buses now use hydrogen as a fuel.
Which of these statements are correct?

- 1 Storing hydrogen requires a heavier fuel tank than is needed to store diesel
- 2 When hydrogen is burnt, no waste product is released into the atmosphere

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

TOTAL FOR HIGHER TIER PAPER: 24 MARKS

END