Surname	Initial(s)
Signature	

Paper Reference(s)

5008 5036

Edexcel GCSE

Science (5008)

Chemistry (5036)

C1b – Topics 7 and 8

Foundation and Higher Tier

Tuesday 15 November 2011 – Morning

Time: 20 minutes

Materials required for examination	**Items included with question papers**
Multiple Choice Answer Sheet HB pencil, eraser and calculator	Nil

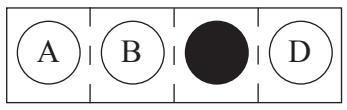
Instructions to Candidates

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.

Fuel

1. Propane is a fuel.
It can be used as a fuel in patio heaters.

Propane is used as a fuel because, when it is burnt, it produces

A heat energy
B soot
C carbon monoxide
D carbon dioxide

2. Hydrocarbons contain

A carbon only
B hydrogen only
C carbon and hydrogen only
D carbon, hydrogen and oxygen

3. When a hydrocarbon burns in oxygen, the reaction is

A distillation
B combustion
C desalination
D fermentation

4. The incomplete combustion of a hydrocarbon can produce a substance which is a gas at room temperature and is toxic.
This gas is

A carbon dioxide
B steam
C carbon monoxide
D carbon

5. Hydrogen can be used as a fuel.
When hydrogen burns in oxygen, the substance formed is

A carbon
B carbon dioxide
C carbon monoxide
D water

6. The symbol for an atom of hydrogen is

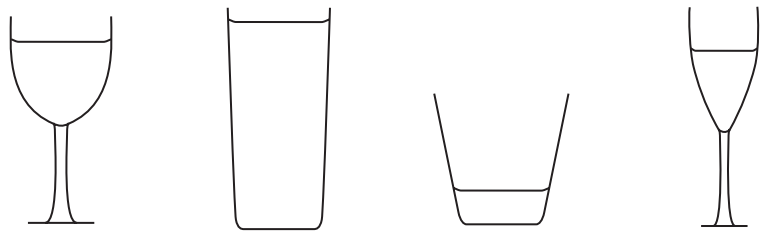
A H
B Hy
C Hd
D Hg

Alcohol

7. When alcoholic drinks are made, sugar is reacted to form the alcohol.
The process is

A fermentation
B distillation
C dehydration
D combustion

8. The table shows glasses of four different alcoholic drinks.
The volume and number of units of alcohol in each drink in each glass is shown.
The percentage of alcohol in each of the alcoholic drinks is also given.



	A	**B**	**C**	**D**
name of alcoholic drink	red wine	lager	whisky	champagne
volume of drink in the glass (cm^3)	175	284	35	125
units of alcohol in the drink in the glass	2.3	1.1	1.4	1.5
percentage of alcohol in the drink (%)	13	4	40	12

Which glass contains the most alcohol?

9. What is the name of the main alcohol present in all alcoholic drinks?

A methanol
B ethanol
C methane
D ethane

10. People should not drink alcoholic drinks and then drive a car because the alcohol

A increases reaction time
B improves vision
C damages health
D makes them more alert

New materials

The picture shows a Gore-Tex jacket with a Thinsulate lining.

11. The reason for using Gore-Tex is to make the jacket

A breathable
B warm
C lightweight
D flame resistant

12. The reason for adding a Thinsulate lining is to make the jacket

A waterproof
B a better insulator
C less flexible
D lighter

13. Members of the emergency services need to wear jackets to protect them from being injured in knife attacks.
Which is the most suitable material to provide this protection?

A Kevlar
B Gore-Tex
C Thinsulate
D Lycra

Our atmosphere

14. Which two gases are present in the largest amounts in the Earth's atmosphere?

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

15. It is thought that the Earth's earliest atmosphere did **not** contain

A oxygen
B nitrogen
C carbon dioxide
D ammonia

16. Pure oxygen is obtained from liquid air by

A combustion
B fractional distillation
C adding water
D dehydration

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

Rock salt and seawater

17. Which of the following substances can be obtained from rock salt during an industrial process?

A oxygen
B chlorine
C nitrogen
D methane

18. A salt which can be obtained from seawater is used to flavour food.
The salt is

A sodium sulphate
B sodium carbonate
C sodium chloride
D sodium hydroxide

19. In some hot countries, drinking water is obtained from seawater using a desalination process.
This process involves

A condensation and then evaporation
B condensation and then filtration
C evaporation and then filtration
D evaporation and then condensation

Sunscreen

Many sunscreens are emulsions.
These contain emulsifiers.

20. An emulsion is a mixture of an emulsifier with

A a liquid and a gas
B a liquid and a solid
C two liquids
D two gases

21. Molecules of the emulsifier are used to stop the emulsion separating.
The molecule of the emulsifier must contain

A a hydrophobic part but no hydrophilic part
B a hydrophilic part but no hydrophobic part
C both a hydrophilic part and a hydrophobic part
D neither a hydrophilic part nor a hydrophobic part

Our future

22. Biofuel made from sugar beet is a sustainable fuel.
This biofuel is sustainable because

A it can be reused
B it does not produce pollutants when burnt
C new sugar beet can be planted to replace that used to make the biofuel
D sugar beet is a waste product

23. A disadvantage of using biofuel, made from sugar beet, rather than fossil fuels is that

A crude oil reserves are used up more quickly
B the biofuel does not produce carbon dioxide when burnt
C growing sugar beet removes carbon dioxide from the atmosphere
D large areas of land are needed to grow sugar beet to produce the biofuel

24. Aluminium is recycled because

A recycling conserves natural resources
B recycling uses no energy
C there is no demand for objects made from recycled aluminium
D recycling aluminium increases the amount of aluminium in landfill sites

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 technology

A new plastic packaging material has been developed to help keep food fresh.
The plastic has a layer of nanoparticles on its surface.

25. The plastic packaging keeps food fresh by preventing the food reacting with

A oxygen
B nitrogen
C carbon dioxide
D argon

26. Which of the following statements about nanoparticles are correct?

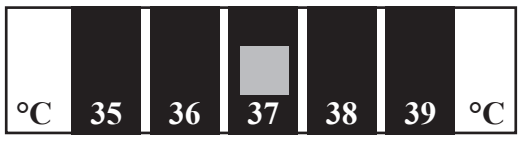
1 the properties of nanoparticles are fully understood
2 nanoparticles of an element are smaller than atoms of that element

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

27. Nanoparticles of zinc oxide are used in some sunscreens.
The reason that nanoparticles rather than conventional-sized particles are used in these sunscreens is that

A conventional-sized particles of zinc oxide do not reflect UV rays
B conventional-sized particles of zinc oxide are invisible to the naked eye
C nanoparticles of zinc oxide do not reflect UV rays
D nanoparticles of zinc oxide are invisible to the naked eye

28. The picture show a strip thermometer.



The strip thermometer is placed on the forehead to measure the temperature of the skin.
Part of the strip changes colour to show the temperature.
The strip thermometer must be made of a material that is

A smart
B intelligent
C an insulator
D soluble

29. Which of the statements about a Gore-Tex membrane are correct?

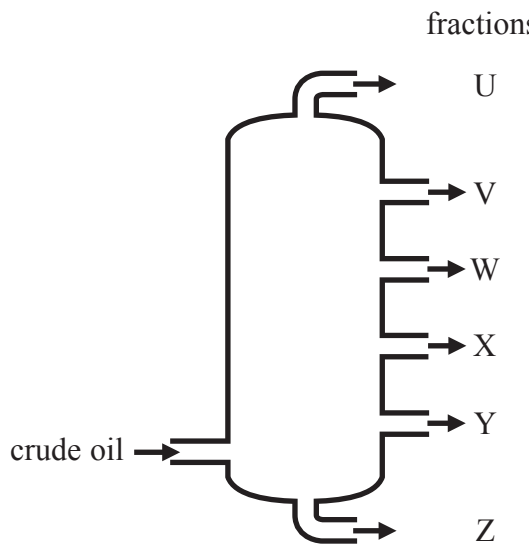
1 water vapour cannot pass through the membrane
2 water droplets can pass through the membrane

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

Fuels

Use the following information to answer questions 30 to 32.

The diagram shows a fractionating column used to obtain fractions from crude oil by fractional distillation.



30. In which fraction do the molecules have the highest average number of carbon atoms?

A U
B W
C Y
D Z

31. Which fraction is the easiest to ignite?

A U
B W
C X
D Z

32. Fractions from crude oil are used as fuels.
Which of these is used as a fuel in the engines of both cars and lorries?

A kerosene
B diesel oil
C bitumen
D fuel oil

33. Which of the following statements about the fractional distillation of crude oil is **not** correct?

A crude oil is a mixture of different compounds
B crude oil enters the fractionating column as a liquid
C each fraction contains more than one hydrocarbon
D each fraction boils over a different temperature range than other fractions

34. This balanced equation shows the reaction occurring when a hydrocarbon burns.
The formula of the molecule of this hydrocarbon is represented by **M**.

$$2\mathbf{M} + 19O_2 \rightarrow 12CO_2 + 14H_2O$$

M is

A C_6H_{12}
B C_6H_{14}
C $C_{12}H_{26}$
D $C_{12}H_{28}$

35. Incomplete combustion of a hydrocarbon can produce carbon monoxide.
Carbon monoxide is toxic because it

A contains oxygen
B contains carbon
C is odourless and colourless
D reduces the ability of blood to carry oxygen

36. Nitrogen can be obtained from air by fractional distillation.
Which of the following statements about this process are correct?

1 air is liquefied before it is fractionally distilled
2 the gases in air are separated because their liquids have different boiling points

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

New fuels

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

1 hydrogen fuel requires a heavier fuel tank than is needed for petrol
2 a toxic product is formed when hydrogen is burnt

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

38. The equation for the combustion of hydrogen in oxygen is

A $2H + O \rightarrow H_2O$
B $H_2 + O_2 \rightarrow H_2O_2$
C $H_2 + O \rightarrow H_2O$
D $2H_2 + O_2 \rightarrow 2H_2O$

39. Ethanol can be used as a fuel.
It can be made from sugar.
Which of the following conditions are required to convert sugar into ethanol?

1 the presence of water
2 the presence of yeast
3 a temperature of 80 °C

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

40. Which is the equation for the reaction occurring when ethanol is made from sugar with the formula, $C_6H_{12}O_6$?

A $C_6H_{12}O_6 + H_2O \rightarrow 2C_2H_4OH + 2CO_2 + H_2$
B $C_6H_{12}O_6 + 2H_2O \rightarrow 2C_2H_5OH + 2H_2CO_3$
C $C_6H_{12}O_6 \rightarrow 2C_2H_4OH + 2CO_2 + H_2O$
D $C_6H_{12}O_6 \rightarrow 2C_2H_5OH + 2CO_2$

TOTAL FOR HIGHER TIER PAPER: 24 MARKS

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