Air

Question Paper 3

Level	IGCSE
Subject	Chemistry (0620/0971)
Exam Board	Cambridge International Examinations (CIE)
Topic	Air and Water
Sub-Topic	Air
Booklet	Question Paper 3

Time Allowed: **23 minutes**

Score: **/19**

Percentage: **/100**

Grade Boundaries:

9	8	7	6	5	4	3	2	1
>85%	75%	68%	60%	53%	48%	40%	33%	<25%

1 A catalytic converter removes harmful gases from motor car exhausts.

Which reaction does **not** take place in a catalytic converter?

A $2CO + O_2 \rightarrow 2CO_2$

B $N_2 + 2CO_2 \rightarrow 2NO + 2CO$

C $2NO_2 \rightarrow N_2 + 2O_2$

D $2NO_2 + 4CO \rightarrow N_2 + 4CO_2$

2 The table gives the composition of the atmosphere of four newly discovered planets.

planet	composition of atmosphere
W	argon, carbon dioxide and oxygen
X	argon, nitrogen and oxygen
Y	argon, carbon dioxide and methane
Z	methane, nitrogen and oxygen

On which planets is the greenhouse effect likely to occur?

A W only

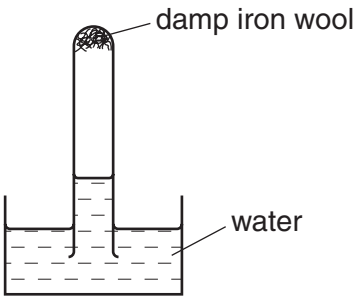
B W, X and Z

C W and Y only

D W, Y and Z

3 A test-tube containing damp iron wool is inverted in water.

After three days, the water level inside the test-tube has risen.



Which statement explains this rise?

A Iron oxide has been formed.

B Iron wool has been reduced.

C Oxygen has been formed.

D The temperature of the water has risen.

4 Which gas is over 30% of air?

A argon

B carbon dioxide

C nitrogen

D oxygen

5 What is produced by the incomplete combustion of methane?

A carbon monoxide

B hydrogen

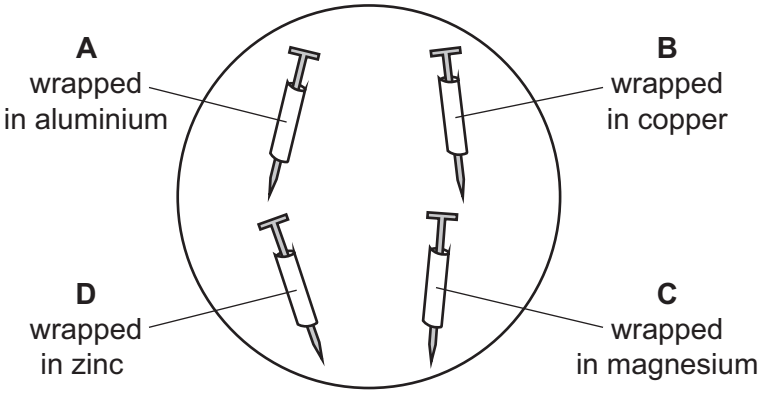
C lead compounds

D sulfur dioxide

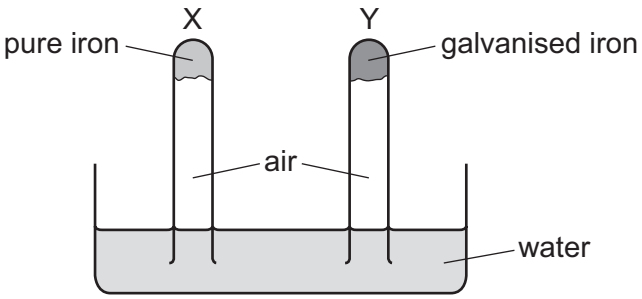
6 Four iron nails had different metals wrapped around them.

The nails were placed in an open dish filled with water and left for a week.

Which iron nail has no protection against rusting?



7 An experiment to investigate the effect of galvanising iron is shown.



The experiment is left for seven days.

What happens to the water level in tubes X and Y?

	tube X	tube Y
A	falls	rises
B	no change	no change
C	rises	falls
D	rises	no change

8 A piece of zinc is attached to the hull of a steel boat. Steel is an alloy of iron.

Which statement explains why the zinc prevents the iron from rusting?

A Zinc is less reactive than iron, and iron is less likely to lose electrons than zinc.

B Zinc is less reactive than iron, and iron is more likely to lose electrons than zinc.

C Zinc is more reactive than iron, and iron is less likely to lose electrons than zinc.

D Zinc is more reactive than iron, and iron is more likely to lose electrons than zinc.

9 Which gas is colourless and poisonous?

A carbon monoxide

B chlorine

C hydrogen

D nitrogen

10 Which gas in the air is needed for iron to rust?

A argon

B carbon dioxide

C nitrogen

D oxygen

11 Which pollutant gas **cannot** be produced by the combustion of fossil fuels (coal, petroleum and natural gas)?

A carbon monoxide

B methane

C nitrogen dioxide

D sulfur dioxide

12 Oxides of nitrogen are found in polluted air.

Which statement about oxides of nitrogen is correct?

A Oxides of nitrogen are formed by the reaction of nitrogen with oxygen during the fractional distillation of liquid air.

B Oxides of nitrogen are formed in a car engine by the reaction of petrol with nitrogen from the air.

C Oxides of nitrogen are removed from exhaust gases by reaction with carbon dioxide in a catalytic converter.

D Oxides of nitrogen are removed from exhaust gases by reduction in a catalytic converter.

13 The carbon cycle includes the processes combustion, photosynthesis and respiration.

Which row shows how each process changes the amount of carbon dioxide in the atmosphere?

	combustion	photosynthesis	respiration
A	decreases	decreases	increases
B	decreases	increases	decreases
C	increases	decreases	increases
D	increases	increases	decreases

14 Which chemical reaction decreases pollution in the air?

A $S + O_2 \rightarrow SO_2$

B $N_2 + O_2 \rightarrow 2NO$

C $2CH_4 + 3O_2 \rightarrow 2CO + 4H_2O$

D $2NO + 2CO \rightarrow 2CO_2 + N_2$

15 The carbon cycle describes how carbon dioxide gas is added to or removed from the atmosphere.

Which row describes the movement of carbon dioxide during each process?

	photosynthesis	combustion	respiration
A	added to the atmosphere	added to the atmosphere	removed from the atmosphere
B	added to the atmosphere	removed from the atmosphere	added to the atmosphere
C	removed from the atmosphere	added to the atmosphere	added to the atmosphere
D	removed from the atmosphere	added to the atmosphere	removed from the atmosphere

16 Petrol burns in a car engine to produce waste gases which leave through the car exhaust.

One of these waste gases is an oxide of nitrogen.

Which statement describes how this oxide of nitrogen is formed?

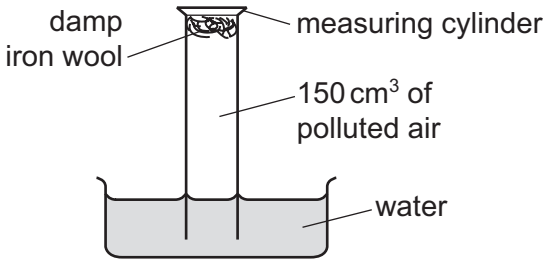
A Carbon dioxide reacts with nitrogen in the catalytic converter.

B Nitrogen reacts with oxygen in the car engine.

C Nitrogen reacts with oxygen in the catalytic converter.

D Petrol combines with nitrogen in the car engine.

17 An experiment to find the percentage of oxygen in 150 cm^3 of polluted air is shown.



The apparatus is left for one week.

After this time, the volume of gas in the measuring cylinder is 122 cm^3.

What is the percentage of oxygen, to the nearest whole number, in the polluted air?

A 19% **B** 21% **C** 28% **D** 81%

18 Which two gases are obtained from liquid air by fractional distillation?

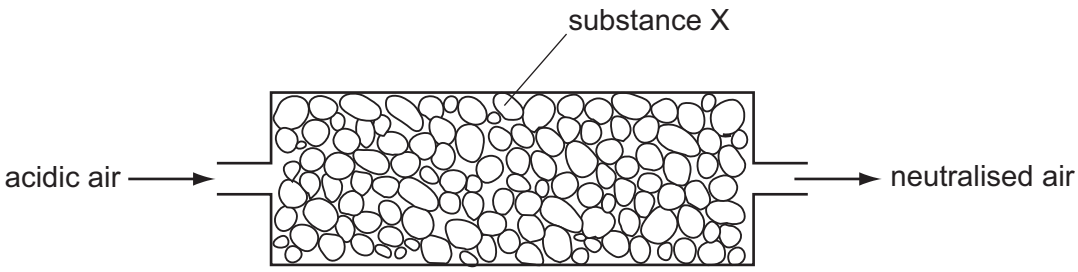
A carbon dioxide and oxygen

B carbon dioxide and water vapour

C nitrogen and oxygen

D nitrogen and water vapour

19 Air containing an acidic impurity was neutralised by passing it through a column containing substance X.



What is substance X?

A calcium oxide

B sand

C sodium chloride

D concentrated sulfuric acid