Types of oxides

Question Paper 1

Level	IGCSE
Subject	Chemistry (0620/0971)
Exam Board	Cambridge International Examinations (CIE)
Topic	Acids, bases and salts
Sub-Topic	Types of oxides
Booklet	Question Paper 1

Time Allowed: **36 minutes**

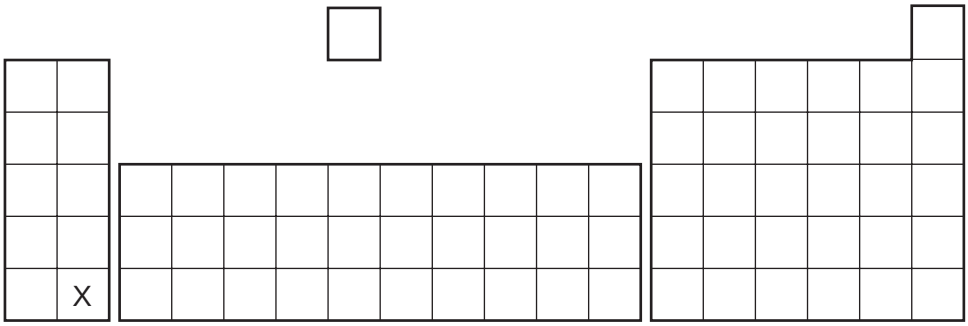
Score: **/30**

Percentage: **/100**

Grade Boundaries:

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

1. The diagram shows the position of an element X in the Periodic Table.

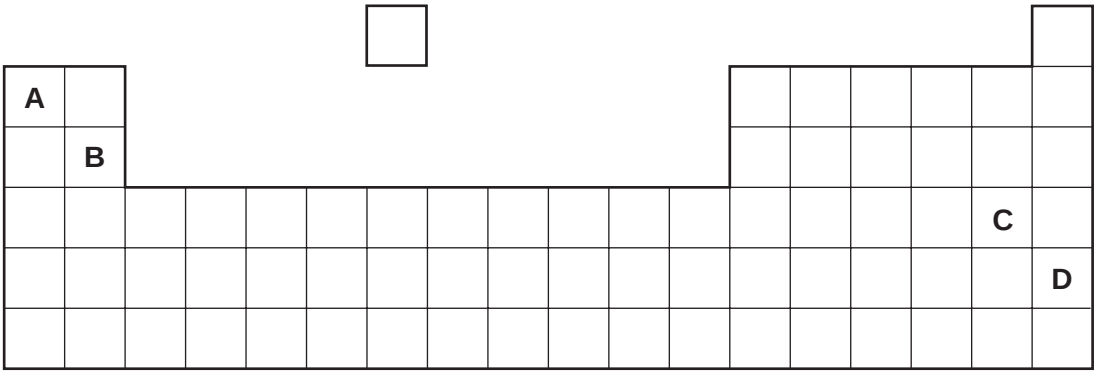


What is the correct classification of element X and its oxide?

	X	oxide of X
A	metal	acidic
B	metal	basic
C	non-metal	acidic
D	non-metal	basic

2. The positions in the Periodic Table of four elements are shown.

Which element is **most** likely to form an acidic oxide?



3. Which property is **not** characteristic of a base?

A It reacts with a carbonate to form carbon dioxide.

B It reacts with an acid to form a salt.

C It reacts with an ammonium salt to form ammonia.

D It turns universal indicator paper blue.

4. Carbon dioxide is an acidic oxide that reacts with aqueous calcium hydroxide.

Which type of reaction takes place?

A decomposition

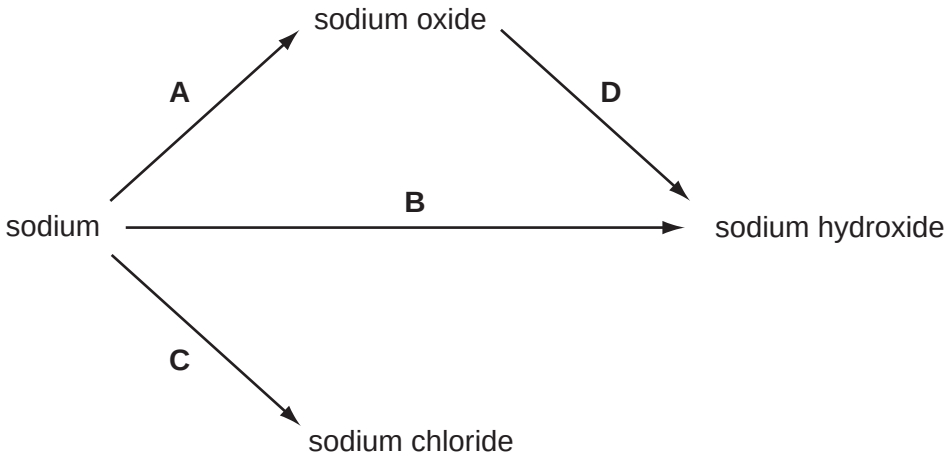
B fermentation

C neutralisation

D oxidation

5. Some reactions involving sodium are shown.

Which reaction does **not** involve the formation of a base?



6. Five elements have proton numbers 10, 12, 14, 16 and 18.

What are the proton numbers of the three elements that form oxides?

A 10, 12 and 14

B 10, 14 and 18

C 12, 14 and 16

D 14, 16 and 18

7. Which of the following are properties of the oxides of non-metals?

	property 1	property 2
A	acidic	covalent
B	acidic	ionic
C	basic	covalent
D	basic	ionic

8. Two oxides, X and Y, are added separately to dilute sulfuric acid and dilute sodium hydroxide.

X reacts with dilute sulfuric acid but Y does not react.

Y reacts with aqueous sodium hydroxide but X does not react.

Which type of oxide are X and Y?

	acidic oxide	basic oxide	metallic oxide
A	X	Y	X
B	X	Y	Y
C	Y	X	X
D	Y	X	Y

9. The diagram shows one period of the Periodic Table.

Li	Be	B	C	N	O	F	Ne

Which two elements form acidic oxides?

A carbon and lithium

B carbon and neon

C carbon and nitrogen

D nitrogen and neon

10. Which statement about oxides is correct?

A A solution of magnesium oxide will have a pH less than 7.

B A solution of sulfur dioxide will have a pH greater than 7.

C Magnesium oxide will react with nitric acid to make a salt.

D Sulfur dioxide will react with hydrochloric acid to make a salt.

11. Only two elements are liquid at 20 °C. One of these elements is shiny and conducts electricity.

This suggests that this element is a .....1..... and therefore its oxide is .....2..... .

Which words correctly complete gaps 1 and 2?

	1	2
A	metal	acidic
B	metal	basic
C	non-metal	acidic
D	non-metal	basic

12. The oxide of element X forms a solution with pH 4.

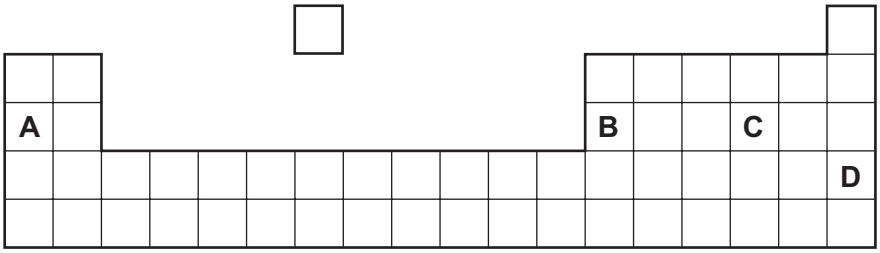
The oxide of element Y forms a solution that turns Universal Indicator blue.

Which row correctly classifies elements X and Y?

	element X	element Y
A	metal	metal
B	metal	non-metal
C	non-metal	metal
D	non-metal	non-metal

13. Part of the Periodic Table is shown.

Which element forms an acidic oxide?



14. Which row describes whether an amphoteric oxide reacts with acids and bases?

	reacts with acids	reacts with bases
A	no	no
B	no	yes
C	yes	no
D	yes	yes

15. Which oxide is amphoteric?

A aluminium oxide

B calcium oxide

C carbon monoxide

D sodium oxide

16 The reactions of four different oxides W, X, Y and Z are shown.

W reacts with hydrochloric acid but not sodium hydroxide.

X reacts with both hydrochloric acid and sodium hydroxide.

Y does not react with either hydrochloric acid or sodium hydroxide.

Z reacts with sodium hydroxide but not hydrochloric acid.

Which row shows the correct types of oxide?

	acidic	basic	amphoteric	neutral
A	W	Z	X	Y
B	X	Y	W	Z
C	Z	X	Y	W
D	Z	W	X	Y

17. Magnesium, phosphorus and chlorine are elements in the same period of the Periodic Table.

Which row describes the type of oxide formed by each of these elements?

	magnesium	phosphorus	chlorine
A	acidic	acidic	basic
B	acidic	basic	basic
C	basic	acidic	acidic
D	basic	basic	acidic

18 Elements Q and R both burn in air.

The oxides formed both dissolve in water.

The solution of the oxide formed from element Q turns Universal Indicator red.

The solution of the oxide formed from element R turns Universal Indicator blue.

What are Q and R?

	Q	R
A	carbon	sulfur
B	sodium	magnesium
C	sodium	sulfur
D	sulfur	sodium

19 Which oxide produces a solution with a pH between pH 1 and pH 7 when reacted with water?

A calcium oxide

B carbon dioxide

C potassium oxide

D sodium oxide

20 Some properties of four oxides are listed.

Oxide 1 reacts with both acids and alkalis to form salts.

Oxide 2 reacts with acids to form salts but does not react with alkalis.

Oxide 3 reacts with alkalis to form salts but does not react with acids.

Oxide 4 does not react with acids or alkalis.

Which row describes the oxides?

	oxide 1	oxide 2	oxide 3	oxide 4
A	amphoteric	acidic	basic	neutral
B	amphoteric	basic	acidic	neutral
C	neutral	acidic	basic	amphoteric
D	neutral	basic	acidic	amphoteric

21 Which oxide dissolves in water to form a basic solution?

A carbon dioxide

B nitrogen dioxide

C sodium oxide

D sulfur dioxide

22 Which oxide is suitable for treating acidic soil?

A calcium oxide

B carbon dioxide

C phosphorus oxide

D silicon(IV) oxide

23 Farmers spread slaked lime (calcium hydroxide) on their fields to neutralise soils that are too acidic for crops to grow well.

Which ion in slaked lime neutralises the acid in the soil?

A Ca^{2+} **B** H^{+} **C** O^{2-} **D** OH^{-}

24 A farmer wrongly adds two substances to the soil at the same time.

They react together to form a gas which turns damp red litmus blue.

What are the two substances?

A a basic oxide and a potassium salt

B a basic oxide and an ammonium salt

C an acidic oxide and a potassium salt

D an acidic oxide and an ammonium salt

25 Zinc oxide is amphoteric.

Which row describes the reactions of zinc oxide?

	reaction with hydrochloric acid	reaction with aqueous sodium hydroxide
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

key

✓ = reaction occurs

✗ = reaction does not occur

26 Which type of oxide is aluminium oxide?

A acidic

B amphoteric

C basic

D neutral

27 Which oxide is amphoteric?

A Al_2O_3 **B** CaO **C** Na_2O **D** SO_2

28 Elements W and X are metals.

Elements Y and Z are non-metals.

The oxides of W, X, Y and Z all form solutions when added to water.

Which statement is correct?

A The solution of the oxide of element W turns blue litmus red.

B The solution of the oxide of element X fizzes when sodium carbonate is added.

C The solution of the oxide of element Y has a pH greater than pH 7.

D The solution of the oxide of element Z fizzes when powdered magnesium is added.

29 Beryllium oxide reacts with both sulfuric acid and aqueous sodium hydroxide.

Which type of oxide is beryllium oxide?

A acidic

B amphoteric

C basic

D neutral

30 Element E:

- forms an alloy
- has a basic oxide
- is below hydrogen in the reactivity series.

What is E?

A carbon

B copper

C sulfur

D zinc