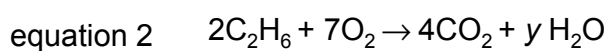
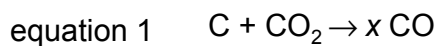


Paper 1

Questions are applicable for both core and extended candidates

1 The equations for two reactions are shown.

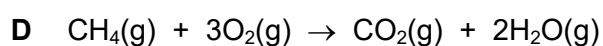
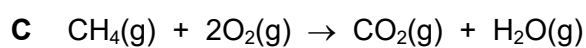
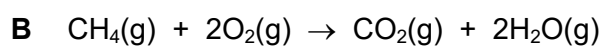
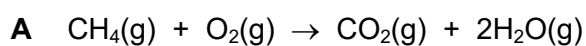


Which row shows the value of x , the value of y and the equations that are for redox reactions?

	value of x	value of y	redox reactions
A	1	3	equation 1 only
B	2	3	equations 1 and 2
C	2	6	equation 1 only
D	2	6	equations 1 and 2

2 Methane, CH_4 , burns in air to form carbon dioxide and water.

What is the balanced equation for this reaction?



Paper 2

Questions are applicable for both core and extended candidates unless indicated in the question

- 3 Magnetite is an ore of iron which contains the ions Fe^{2+} , Fe^{3+} and O^{2-} only.

What is the formula of magnetite? (extended only)

- A Fe_2O B Fe_2O_3 C Fe_3O_2 D Fe_3O_4

- 4 Which formula is an empirical formula? (extended only)

- A $\text{C}_2\text{H}_4\text{O}$
B $\text{C}_4\text{H}_8\text{O}_2$
C $\text{C}_3\text{H}_7\text{COOH}$
D $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOH}$

- 5 Which equations are balanced?

- 1 $\text{Fe}_2\text{O}_3 + 3\text{CO} \rightarrow 2\text{Fe} + 3\text{CO}_2$
2 $\text{ZnCO}_3 + 2\text{HCl} \rightarrow \text{ZnCl}_2 + \text{CO}_2 + 2\text{H}_2\text{O}$
3 $\text{Mg}(\text{NO}_3)_2 + \text{NaOH} \rightarrow \text{Mg}(\text{OH})_2 + 2\text{NaNO}_3$
4 $\text{CaCO}_3 + \text{H}_2\text{SO}_4 \rightarrow \text{CaSO}_4 + \text{H}_2\text{O} + \text{CO}_2$

- A 1 and 2 B 1 and 4 C 2 and 3 D 3 and 4

- 6 Aqueous iron(III) sulfate and aqueous sodium hydroxide react to give a precipitate of iron(III) hydroxide and a solution of sodium sulfate.

What is the balanced symbol equation for this reaction? (extended only)

- A $\text{Fe}_2(\text{SO}_4)_3(\text{aq}) + 2\text{NaOH}(\text{aq}) \rightarrow \text{Fe}(\text{OH})_3(\text{s}) + \text{Na}_2\text{SO}_4(\text{aq})$
B $\text{Fe}_2(\text{SO}_4)_3(\text{aq}) + 3\text{NaOH}(\text{aq}) \rightarrow \text{Fe}(\text{OH})_3(\text{s}) + 3\text{Na}_2\text{SO}_4(\text{aq})$
C $\text{Fe}_2(\text{SO}_4)_3(\text{aq}) + 6\text{NaOH}(\text{aq}) \rightarrow 2\text{Fe}(\text{OH})_3(\text{s}) + 3\text{Na}_2\text{SO}_4(\text{aq})$
D $2\text{Fe}_2(\text{SO}_4)_3(\text{aq}) + 6\text{NaOH}(\text{aq}) \rightarrow 4\text{Fe}(\text{OH})_3(\text{s}) + 6\text{Na}_2\text{SO}_4(\text{aq})$

- 7 Sodium nitride contains the nitride ion, N^{3-} .

Sodium nitride is unstable and decomposes into its elements.

What is the equation for the decomposition of sodium nitride? **(extended only)**

- A** $2\text{NaN}_3 \rightarrow 2\text{Na} + 3\text{N}_2$
B $2\text{Na}_3\text{N} \rightarrow 6\text{Na} + \text{N}_2$
C $2\text{NaN}_3 \rightarrow \text{Na}_2 + 3\text{N}_2$
D $2\text{Na}_3\text{N} \rightarrow 6\text{Na} + 2\text{N}$

- 8 Compound X contains carbon, hydrogen and oxygen only.

By mass, it contains 26.7% carbon and 2.2% hydrogen.

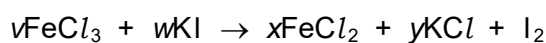
What is the empirical formula of X? **(extended only)**

- A** CHO **B** C_2HO **C** CH_2O **D** CHO_2

- 9 Which word equation represents a reaction that occurs?

- A** sodium oxide + carbon \rightarrow sodium + carbon dioxide
B sodium oxide + iron \rightarrow sodium + iron(II) oxide
C iron(II) oxide + copper \rightarrow iron + copper(II) oxide
D iron(III) oxide + carbon \rightarrow iron + carbon dioxide

- 10 Aqueous iron(III) chloride, FeCl_3 , reacts with aqueous potassium iodide, KI.



Which statements are correct?

- 1 In the balanced equation, v , w , x and y have the same value.
- 2 Potassium iodide is an oxidising agent.
- 3 A dark brown solution is produced in the reaction.

- A** 1 and 2 **B** 1 and 3 **C** 2 only **D** 2 and 3

11 Which row shows the formulae of sodium carbonate, zinc nitrate and ammonium sulfate?

	sodium carbonate	zinc nitrate	ammonium sulfate
A	Na_2CO_3	ZnNO_3	$(\text{NH}_4)_2\text{SO}_4$
B	Na_2CO_3	$\text{Zn}(\text{NO}_3)_2$	$(\text{NH}_4)_2\text{SO}_4$
C	NaCO_3	ZnNO_3	$(\text{NH}_3)_2\text{SO}_4$
D	NaCO_3	$\text{Zn}(\text{NO}_3)_2$	$(\text{NH}_3)_2\text{SO}_4$

12 Zinc oxide reacts with carbon to produce zinc.

Which equation represents this reaction?

- A** $2\text{ZnO} + \text{C} \rightarrow 2\text{Zn} + \text{CO}$
- B** $2\text{ZnO} + 2\text{C} \rightarrow 2\text{Zn} + 2\text{CO}_2$
- C** $\text{ZnO} + \text{C} \rightarrow \text{Zn} + \text{CO}$
- D** $\text{ZnO} + 2\text{C} \rightarrow \text{Zn} + 2\text{CO}_2$