

1.1 Matter, Chemical Change & the Mole Concept

Question Paper

Course	DPIB Chemistry
Section	1. Stoichiometric Relationships
Topic	1.1 Matter, Chemical Change & the Mole Concept
Difficulty	Easy

Time allowed: 20
Score: /13
Percentage: /100

Question 1

A periodic table is needed for this question

A compound has an empirical formula of C_2H_6O and a molar mass of 92.16.
What is the molecular formula of this compound?

- A** C_2H_6O
- B** $C_4H_{12}O_2$
- C** $C_6H_{18}O_3$
- D** $C_8H_{24}O_4$

[1 mark]

Question 2

Which equation below represents deposition?

- A** $2Al(s) + 3Br_2(g) \rightarrow 2AlBr_3(s)$
- B** $MgCO_3(s) + 2HCl(aq) \rightarrow MgCl_2(aq) + CO_2(g) + H_2O(l)$
- C** $I_2(g) \rightarrow I_2(s)$
- D** $HgCl_2(s) \rightarrow HgCl_2(g)$

[1 mark]

Question 3

Below are three statements about mixtures. Which of them are correct?

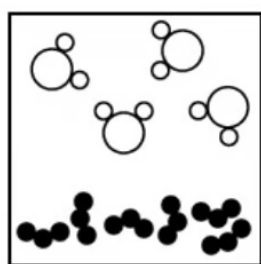
- I Mixtures can contain elements and compounds.
- II The components of a mixture must be in the same state.
- III The components of a mixture keep their own properties.

- A I and II only
- B I and III only
- C II and III only
- D I, II and III

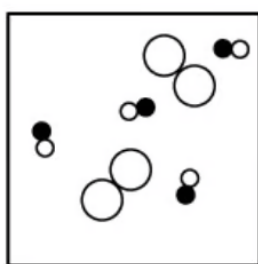
[1 mark]

Question 4

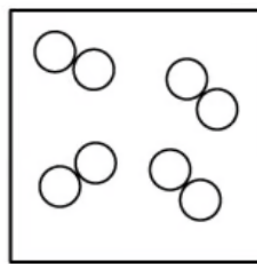
Which box shows a heterogeneous mixture?



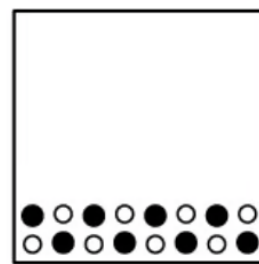
A



B



C



D

[1 mark]

Question 5

Ethane has the formula C_2H_6 . What is the mass in grams of one molecule of ethane?
(RAMs: C = 12.0; H = 1.0)

- A** 1.8×10^{25}
- B** 3.0×10^{-23}
- C** 30.0
- D** 5.0×10^{-23}

[1 mark]

Question 6

Shown below are four molecular formulas. Which one is also an empirical formula?

- A** PCl_5
- B** CH_3COOH
- C** H_2O_2
- D** $C_6H_{12}O_6$

[1 mark]

Question 7

The relative atomic mass is a way of representing the mass of an atom.

Which of the following definitions is correct for the term relative atomic mass?

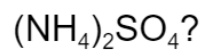
- A** the mass of an electron
- B** 1/12 the mass of a carbon-12 atom
- C** the mass of a hydrogen-1 atom
- D** the mass of a proton

[1 mark]

Question 8

A periodic table is needed for this question

Which of the following shows the relative formula mass of ammonium sulfate,

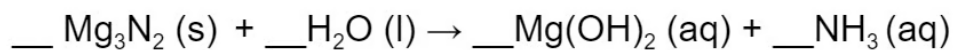


- A** 70.00
- B** 132.00
- C** 114.09
- D** 132.17

[1 mark]

Question 9

When the following equation is balanced correctly, using the smallest whole number coefficients, which row represents the coefficients?



	Mg_3N_2	H_2O	$\text{Mg}(\text{OH})_2$	NH_3
A	1	6	3	2
B	1	3	3	1
C	2	6	2	2
D	2	6	3	2

[1 mark]

Question 10

Which one of the following is the correct net ionic equation for the reaction between CaCl_2 and AgNO_3 ?

- A** $\text{Ca}^{2+} (\text{aq}) + 2\text{AgNO}_3 (\text{aq}) \rightarrow 2\text{Ag}^+ (\text{s}) + \text{Ca}(\text{NO}_3)_2 (\text{aq})$
- B** $\text{CaCl}_2 (\text{aq}) + 2\text{Ag}^+ (\text{aq}) \rightarrow 2\text{AgCl} (\text{s}) + \text{Ca}^{2+} (\text{aq})$
- C** $\text{Ca}^{2+} (\text{aq}) + 2\text{NO}_3^- (\text{aq}) \rightarrow \text{Ca}(\text{NO}_3)_2 (\text{aq})$
- D** $\text{Ag}^+ (\text{aq}) + \text{Cl}^- (\text{aq}) \rightarrow \text{AgCl} (\text{s})$

[1 mark]

Question 11

Which one of the following is the correct net ionic equation for the reaction between $\text{NaC}_2\text{H}_3\text{O}_2(\text{aq})$ and $\text{HCl}(\text{aq})$?

- A** $\text{C}_2\text{H}_3\text{O}_2^- (\text{aq}) + \text{HCl} (\text{aq}) \rightarrow \text{CCl}^- (\text{aq}) + 2\text{H}_2 (\text{aq}) + \text{CO}_2 (\text{aq})$
- B** $\text{C}_2\text{H}_3\text{O}_2^- (\text{aq}) + \text{H}^+ (\text{aq}) \rightarrow \text{HC}_2\text{H}_3\text{O}_2 (\text{aq})$
- C** $\text{Na}^+ (\text{aq}) + \text{Cl}^- (\text{aq}) \rightarrow \text{NaCl} (\text{aq})$
- D** $\text{NaC}_2\text{H}_3\text{O}_2 (\text{aq}) + \text{H}^+ (\text{aq}) \rightarrow \text{HC}_2\text{H}_3\text{O}_2 (\text{aq}) + \text{Na}^+ (\text{aq})$

[1 mark]

Question 12

A sample of hydrated calcium sulfate, $\text{CaSO}_4 \cdot x\text{H}_2\text{O}$, has a relative formula mass of 172.19

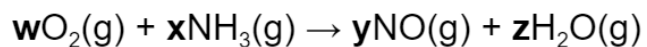
What is the value of x ?

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

[1 mark]

Question 13

Oxidation of ammonia by oxygen is the first step in the manufacture of nitric acid, which is used in the production of the synthetic material nylon.



Which values for **w**, **x**, **y** and **z** balance this equation?

	w	x	y	z
A	5	4	4	6
B	6	4	4	5
C	6	5	5	4
D	5	6	6	4

[1 mark]