

## the mole [7 marks]

1. [Maximum mark: 1]

How many moles of phosphate ions,  $\text{PO}_4^{3-}$ , are there in 103.39 g of  $\text{Ca}_3(\text{PO}_4)_2$ ?

$M_r = 310.18$

A. 0.11

B. 0.33

C. 0.67

D. 2.00

[1]

2. [Maximum mark: 1]

Which compound has the highest percentage of carbon by mass?

A.  $\text{CH}_4$

B.  $\text{C}_2\text{H}_6$

C.  $\text{CO}$

D.  $\text{CO}_2$

[1]

3. [Maximum mark: 1]

What is correct for the empirical formula of a compound?

A. The number of atoms of each element in a molecule of the compound

- B. The total number of atoms in a molecule of the compound
- C. The simplest ratio of atoms of each element in a molecule of the compound
- D. The total number of elements in a molecule of the compound

[1]

4. [Maximum mark: 1]

What is the number of hydrogen atoms in 2.00 mol of  $\text{NH}_3$ ?

Avogadro's constant ( $L$  or  $N_A$ ) =  $6.02 \times 10^{23} \text{ mol}^{-1}$

A.  $1.20 \times 10^{24}$

B.  $1.81 \times 10^{24}$

C.  $2.41 \times 10^{24}$

D.  $3.61 \times 10^{24}$

[1]

5. [Maximum mark: 1]

Which information does the molecular formula provide?

- A. The simplest ratio of atoms in a molecule
- B. The actual numbers of atoms in a molecule
- C. The number of molecules in one mole
- D. The types of bonds in a molecule

[1]

6. [Maximum mark: 1]

How many oxygen atoms are present in 0.0500 mol  $\text{Ba}(\text{OH})_2 \cdot 8\text{H}_2\text{O}$ ?

$$N_{\text{A}} = 6.02 \times 10^{23}$$

A.  $3.01 \times 10^{23}$

B.  $6.02 \times 10^{23}$

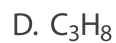
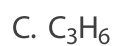
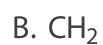
C.  $3.01 \times 10^{24}$

D.  $6.02 \times 10^{24}$

[1]

7. [Maximum mark: 1]

Which is a possible empirical formula for a substance with  $M_{\text{r}} = 42$ ?



[1]