

4.1 Ionic & Covalent Bonding

Question Paper

Course	DPIB Chemistry
Section	4. Chemical Bonding & Structure
Topic	4.1 Ionic & Covalent Bonding
Difficulty	Medium

Time allowed: 20
Score: /10
Percentage: /100

Question 1

Which of the following statements about 2-methylpropan-2-ol, $\text{CH}_3\text{C}(\text{CH}_3)(\text{OH})\text{CH}_3$, are correct?

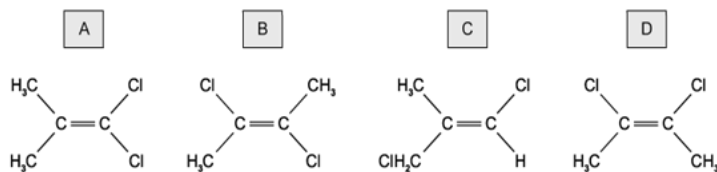
- I. The structure contains 16 bonding pair of electrons
- II. The O-C-C bond angle is 109.5°
- III. The total number of electrons is 32

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

[1 mark]

Question 2

Which of the following molecules has the biggest overall dipole?



[1 mark]

Question 3

The electronegativity of four elements are given below

$$\text{N} = 3.0 \quad \text{H} = 2.1 \quad \text{F} = 4.0 \quad \text{P} = 2.1$$

What is the correct order of polarity for the following compounds

- A. $\text{PH}_3 < \text{PF}_3 < \text{NF}_3 < \text{NH}_3$
- B. $\text{PH}_3 < \text{PF}_3 < \text{NH}_3 < \text{NF}_3$
- C. $\text{NF}_3 < \text{NH}_3 < \text{PH}_3 < \text{PF}_3$
- D. $\text{PH}_3 < \text{NH}_3 < \text{NF}_3 < \text{PF}_3$

[1 mark]

Question 4

Which of the following compounds has both covalent and ionic bonds?

- A. calcium bromide, CaBr_2
- B. potassium carbonate, K_2CO_3
- C. propanoic acid, $\text{CH}_3\text{CH}_2\text{COOH}$
- D. dichloromethane, CH_2Cl_2

[1 mark]

Question 5

Which is the best description of ionic bonding?

- A. electrostatic attraction between cations and electrons
- B. electrostatic attraction between nuclei
- C. electrostatic attraction between oppositely charged ions
- D. electrostatic attraction of nuclei towards shared electrons in the bond between the nuclei

[1 mark]

Question 6

Below are four molecules. Which is the **most** polar molecule present?

- A. CH_3NH_2
- B. CH_4
- C. CCl_4
- D. CO_2

[1 mark]

Question 7

Potassium bromide is an ionic compound.

When can potassium bromide conduct electricity?

	Solid	Molten	Aqueous
A	✓	✓	x
B	✓	x	✓
C	x	✓	✓
D	x	x	✓

- A.
- B.
- C.
- D.

[1 mark]

Question 8

A periodic table is needed to answer this question.

Of the four compounds listed below which one has the greatest ionic character?

- A. HCl
- B. MgS
- C. CO₂
- D. CaO

[1 mark]

Question 9

What is the correct formula for aluminium sulfate?

- A. Al₃(SO₄)₂
- B. Al(SO₄)₂
- C. Al₂(SO₄)₃
- D. AlSO₄

[1 mark]

Question 10

Aluminium iodide, Al_2I_6 is a dimer and exists as a solid at room temperature. When it is a vapour it can exist as an AlI_3 molecule.

How many valence electrons are in an aluminium iodide, AlI_3 , molecule?

- A. 22
- B. 24
- C. 26
- D. 28

[1 mark]