Practice Question Set For A-Level
Subject : Chemistry
Paper-2 Topic: Physical

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Name of the Student:_____
Max. Marks : 18 Marks **Time : 18 Minutes**

Q1.

This question is about structure and bonding.

(a) Draw a diagram to show the strongest type of interaction between two molecules of ethanol (C_2H_5OH) in the liquid phase.

Include all lone pairs and partial charges in your diagram.

(3)

(c) Methoxymethane (CH_3OCH_3) is an isomer of ethanol.

The table shows the boiling points of ethanol and methoxymethane.

Compound	**Boiling point / °C**
ethanol	78
methoxymethane	−24

In terms of the intermolecular forces involved, explain the difference in boiling points.

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(3)

(c) Draw the shape of the $POCl_3$ molecule and the shape of the ClF_4^- ion.
Include any lone pairs of electrons that influence the shapes.

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In a $POCl_3$ molecule the oxygen atom is attached to the phosphorus atom by a double bond that uses two electrons from phosphorus.

Name each shape.

Suggest a value for the bond angle in ClF_4^-

Shape of $POCl_3$ Shape of ClF_4^-

Name of shape of $POCl_3$ _____

Name of shape of ClF_4^- _____

Bond angle in ClF_4^- _____

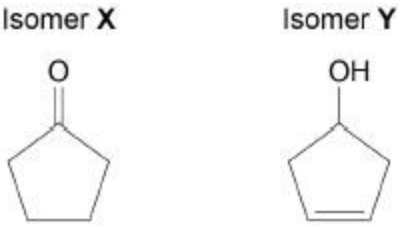
(5)

(Total 11 marks)

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Q2.

Isomers **X** and **Y** have the molecular formula C_5H_8O



(a) Give the IUPAC name for isomer **X**.

_____

(1)

(b) Explain how and why isomers **X** and **Y** can be distinguished by comparing **each** of their

- boiling points
- ^{13}C NMR spectra
- infrared spectra.

Use data from Tables **A** and **C** in the Data Booklet in your answer.

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(6)

(Total 7 marks)

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