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

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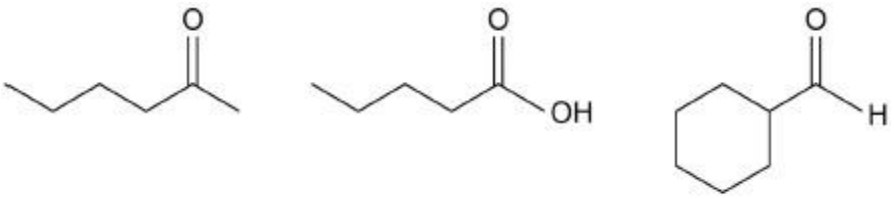
Name of the Student:_____
Max. Marks : 21 Marks **Time : 21 Minutes**

Q1.

The structures of three organic compounds A, B and C are shown.



Compound **A** Compound **B** Compound **C**

These compounds can be distinguished by simple test-tube reactions.

For each pair of compounds in questions **(a)** and **(b)**, give a reagent (or combination of reagents) that could be added separately to each compound to distinguish between them.

State what is observed in each case.

(a) Compounds **A** and **B**

Reagent _____

Observation with **A** _____

_____

Observation with **B** _____

_____

(3)

(b) Compounds **A** and **C**

Reagent _____

Observation with **A** _____

_____

Observation with **C** _____

_____

(3)
(Total 6 marks)

Q2.

This question is about isomers.

(a) Give a reagent and observations for a test-tube reaction to distinguish between 2-methylbutan-1-ol and 2-methylbutan-2-ol.

Reagent _____

_____

Observation with 2-methylbutan-1-ol _____

_____

_____

Observation with 2-methylbutan-2-ol _____

_____

_____

(3)

(b) Compounds **A** and **B** both have the molecular formula $C_4H_8Br_2$
A has a singlet, a triplet and a quartet in its ^1H NMR spectrum.
B has only two singlets in its ^1H NMR spectrum.

Draw a structure for each of **A** and **B**.

A **B**

(2)

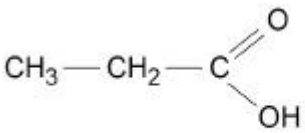
(c) Compounds **C** and **D** both have the molecular formula $C_6H_3Br_3$
C has two peaks in its ^{13}C NMR spectrum.
D has four peaks in its ^{13}C NMR spectrum.

Draw a structure for each of **C** and **D**

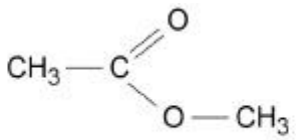
C **D**

(2)

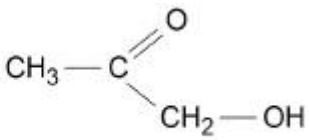
(d) Compounds **E**, **F**, and **G** are isomers.



E



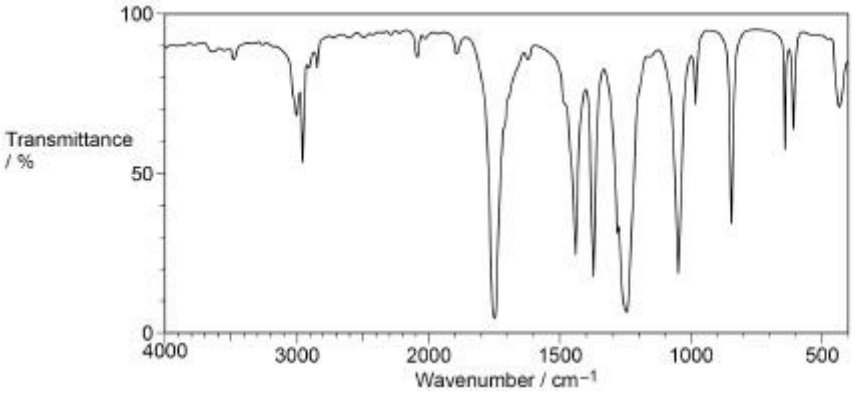
F

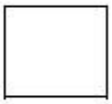


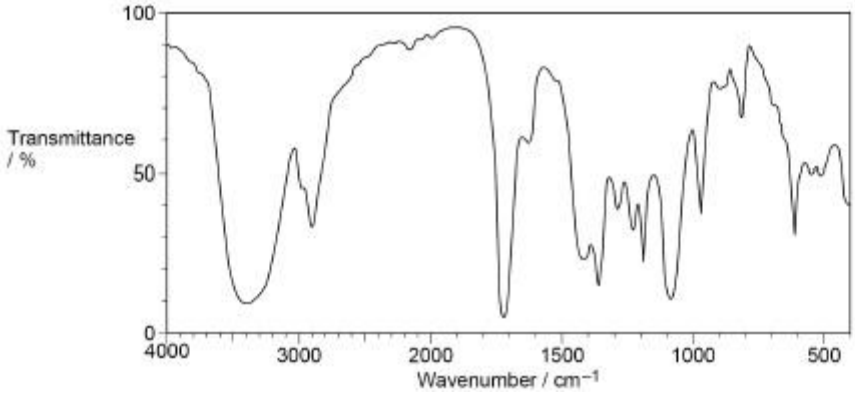
G

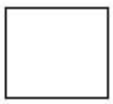
The diagrams below show the infrared spectra of these isomers, but not necessarily in the same order.

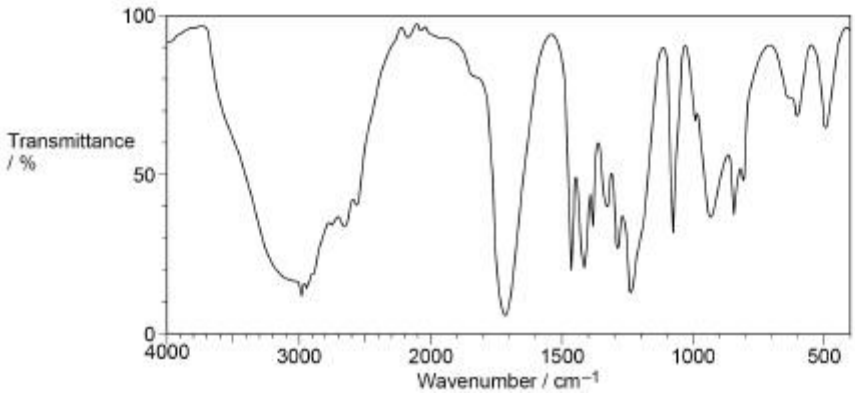
Label each spectrum with the correct letter **E**, **F**, and **G** in the box.

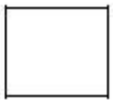












(1)

(Total 8 marks)

Q3.

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

Isomer **X**

Isomer **Y**

(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.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

(6)

(Total 7 marks)