Practice Question Set For A-Level
Subject : Chemistry
Paper-2 Topic: Nuclear Magnetic Resonance Spectroscopy

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Name of the Student:_____
Max. Marks : 24 Marks **Time : 24 Minutes**

Q1.

(a) Describe how propanal, CH_3CH_2CHO, and propanone, CH_3COCH_3, can be distinguished using

(i) a chemical test and

_____

_____

_____

_____

_____

_____

(3)

(ii) the number of peaks in their proton n.m.r. spectra.

_____

_____

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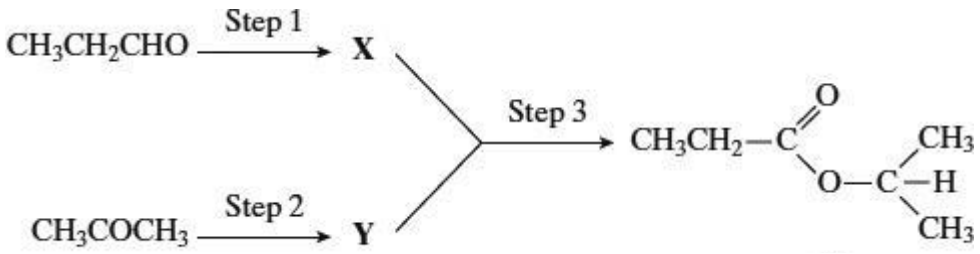
_____

(2)

(b) Compound **Z** can be produced by the reaction of compound **X** with compound **Y** as shown in the synthesis outlined below.

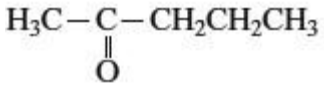


Identify compounds **X** and **Y**.
For each of the three steps in the synthesis, name the type of reaction involved and give reagents and conditions. Equations are **not** required.

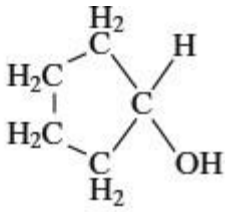
(10)
(Total 15 marks)

Q2.

Compounds **C** and **D**, shown below, are isomers of $C_5H_{10}O$



C



D

(a) Name compound **C**.

_____

(1)

(b) Use **Table 2** on the Data Sheet to help you to answer this question.

(i) Suggest the wavenumber of an absorption which is present in the infra-red spectrum of **C** but not in that of **D**.

_____

(ii) Suggest the wavenumber of an absorption which is present in the infra-red spectrum of **D** but not in that of **C**.

_____

(2)

(c) Deduce the number of peaks in the proton n.m.r. spectrum of **C**.

_____

(1)

(d) Identify a reagent that you could use to distinguish between **C** and **D**. For each of **C** and **D**, state what you would observe when the compound is treated with this reagent.

Reagent _____

Observation with **C** _____

Observation with **D** _____

(3)

(e) Compound **E**, $CH_3CH_2CH_2CH_2CHO$, is also an isomer of $C_5H_{10}O$

Identify a reagent which will react with **E** but not with **C** or **D**. State what you would observe when **E** is treated with this reagent.

Reagent _____

Observation with **E** _____

(2)

(Total 9 marks)