Practice Question Set For A-Level
Subject : Chemistry
Paper-2 Topic: Aldehydes & ketones

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Name of the Student:_____
Max. Marks :19 Marks **Time :19 Minutes**

Q1.

What is the product when 3-methylbutan-2-one reacts with acidified KCN?

A 2-hydroxy-2,3-dimethylbutanenitrile ⬭

B 3-hydroxy-2,3-dimethylbutanenitrile ⬭

C 2-hydroxy-3-methylpentanenitrile ⬭

D 3-hydroxy-2-methylpentanenitrile ⬭

(Total 1 mark)

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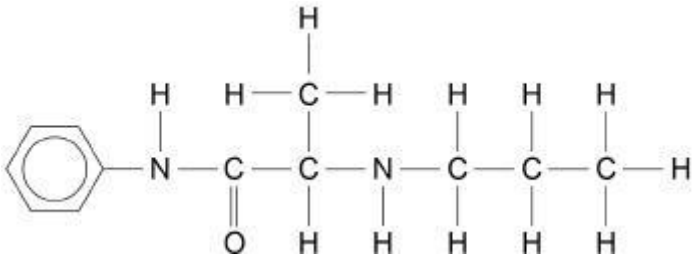
Q2.

Prilocaine is used as an anaesthetic in dentistry.
Figure 1 shows the structure of prilocaine.

Figure 1



(a) Draw a circle around any chiral centre(s) in **Figure 1**.

(1)

(b) Identify the functional group(s) in the prilocaine molecule.

Tick (✓) the box(es) corresponding to the functional group(s).

Amide	Amine	Ester	Ketone

(1)

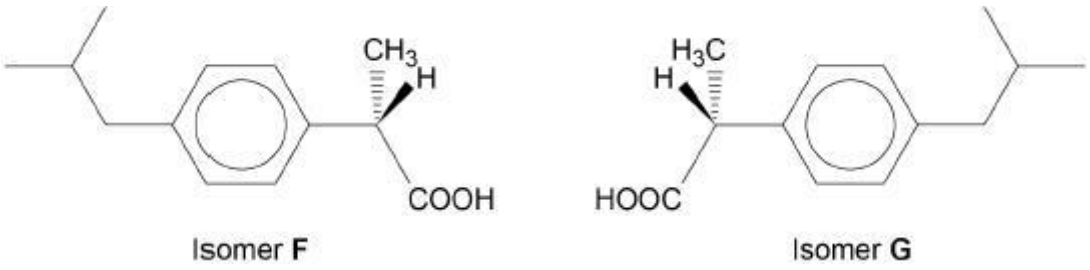
(c) Prilocaine is completely hydrolysed in the human body to give a mixture of products.

Draw the structures of the two organic products formed in the complete hydrolysis of prilocaine in acidic conditions.

(3)

(d) **Figure 2** shows optical isomers **F** and **G**.

Figure 2



Isomer **F** is the active compound in the medicine ibuprofen.

In the manufacture of ibuprofen both isomers **F** and **G** are formed. An enzyme is then used to

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bind to isomer **G** and catalyse its hydrolysis.

After the products of hydrolysis of **G** are removed, a pure sample of isomer **F** is collected.

Explain how a structural feature of this enzyme enables it to catalyse the hydrolysis of isomer **G** but not the hydrolysis of isomer **F**.

_____

_____

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(2)

(Total 7 marks)

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Q3.

This question is about ketones.

(a) Solution **X** reacts with liquid ketones to form a crystalline solid.

This reaction can be used to identify a ketone if the crystalline solid is separated, purified by recrystallisation, and the melting point determined.

Describe how the crystalline solid is separated and purified.

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(5)

(b) Propanone (CH_3COCH_3) reacts with the weak acid HCN to form a hydroxynitrile.

This hydroxynitrile is usually made by reaction of propanone with KCN followed by dilute acid, instead of with HCN

State the hazard associated with the use of KCN

Suggest a reason, other than safety, why KCN is used instead of HCN.

Hazard _____

Why KCN is used _____

_____

(2)

(c) Outline the mechanism for the reaction of propanone with KCN followed by dilute acid.

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(4)
(Total 11 marks)

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