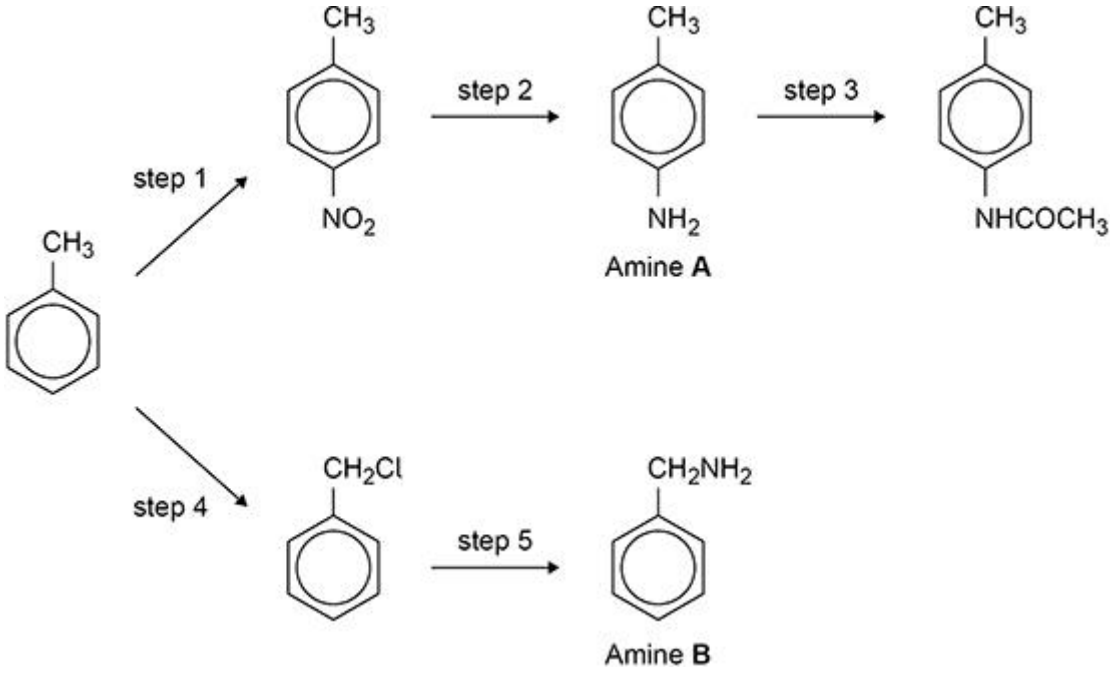
Practice Question Set For A-Level
Subject : Chemistry
Paper-2 Topic: Amines

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

Q1.

This question is about the reaction scheme shown.



(a) State the reagents needed for step **1** and the reagents needed for step **2**.

step **1** _____

_____

step **2** _____

_____

(3)

(b) Give the name of the mechanism for the reaction in step **3**.

_____

(1)

(c) Name the reagent for step **4**.

State a necessary condition for step **4**.

Reagent _____

Condition _____

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(2)

(d) Amine **A** is formed in step **2** and amine **B** is formed in step **5**.

Explain why the yield of **B** in step **5** is less than the yield of **A** in step **2**.

_____

_____

_____

_____

(2)

(e) Explain why amine **B** is a stronger base than amine **A**.

_____

_____

_____

_____

(2)

(Total 10 marks)

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Q2.

Methylamine reacts with bromoethane by nucleophilic substitution to produce a mixture of products.

Which is **not** a possible product of this reaction?

A $C_2H_5NHCH_3$ ⬭

B $(C_2H_5)_2NCH_3$ ⬭

C $[(C_2H_5)_2N(CH_3)_2]^+ Br^-$ ⬭

D $[(C_2H_5)_3NCH_3]^+ Br^-$ ⬭

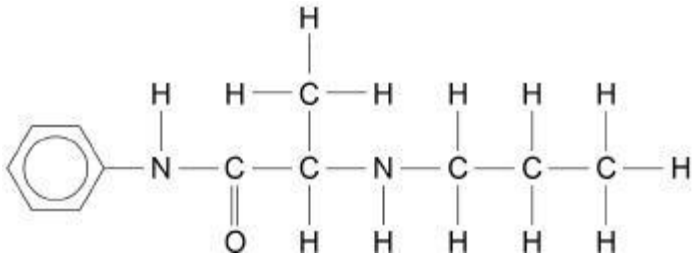
(Total 1 mark)

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Q3.

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)

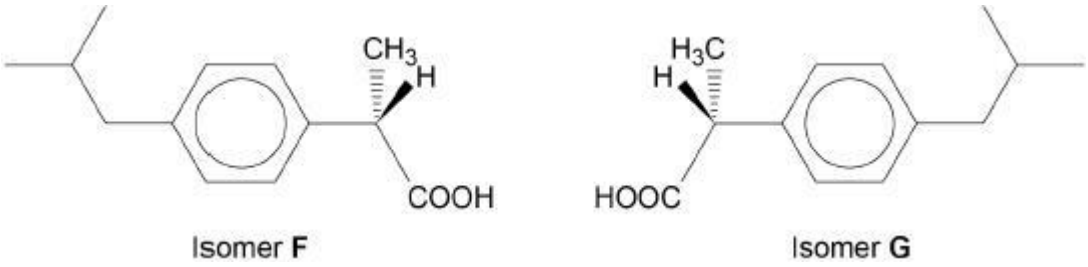
(c) Prilocaine is completely hydrolysed in the human body to give a mixture of products.

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** Isomer **G**

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**.

_____

_____

_____

_____

(2)

(Total 7 marks)

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