

Name of the Student: _____

Max. Marks : 20 Marks

Time : 20 Minutes

Q1.

This question is about the primary amine $\text{CH}_3\text{CH}_2\text{CH}_2\text{NH}_2$

- (a) The amine $\text{CH}_3\text{CH}_2\text{CH}_2\text{NH}_2$ reacts with CH_3COCl

Name and outline a mechanism for this reaction.

Give the IUPAC name of the organic product.

(6)

- (b) Isomers of $\text{CH}_3\text{CH}_2\text{CH}_2\text{NH}_2$ include another primary amine, a secondary amine and a tertiary amine.

- (i) Draw the structures of these **three** isomers.
Label each structure as primary, secondary or tertiary.

(3)

- (ii) Use **Table 1** on the Data Sheet to explain how you could use infrared spectra in the range outside the fingerprint region to distinguish between the secondary amine and the tertiary amine.

(2)

- (c) The amine $\text{CH}_3\text{CH}_2\text{CH}_2\text{NH}_2$ can be prepared by two different routes.

Route **A** is a two-stage process and starts from $\text{CH}_3\text{CH}_2\text{Br}$.

Route **B** is a one-stage process and starts from $\text{CH}_3\text{CH}_2\text{CH}_2\text{Br}$.

- (i) Identify the intermediate compound in Route **A**.

Give the reagents and conditions for both stages in Route **A** and the single stage in Route **B**.

(7)

- (ii) Give **one** disadvantage of Route **A** and **one** disadvantage of Route **B**.

(2)

(Total 20 marks)