

Name of the Student: _____

Max. Marks : 21 Marks

Time : 21 Minutes

Q1.

2-Methylpropan-1-ol can be prepared by reacting 1-bromo-2-methylpropane with dilute aqueous sodium hydroxide.

- (a) Name and outline the mechanism for this reaction.

Name of mechanism _____

Mechanism

(3)

- (b) When 2.0 cm^3 of 1-bromo-2-methylpropane ($M_r = 136.9$) were reacted with an excess of sodium hydroxide, 895 mg of 2-methylpropan-1-ol ($M_r = 74.0$) were obtained.

The density of 1-bromo-2-methylpropane is 1.26 g cm^{-3}

Calculate the percentage yield for this reaction.

Percentage yield _____

(3)

- (c) When 1-bromo-2-methylpropane reacts with hot, concentrated ethanolic potassium hydroxide rather than dilute aqueous sodium hydroxide, a different product is formed.

Name this organic product and name the mechanism for this reaction.

Name of organic product _____

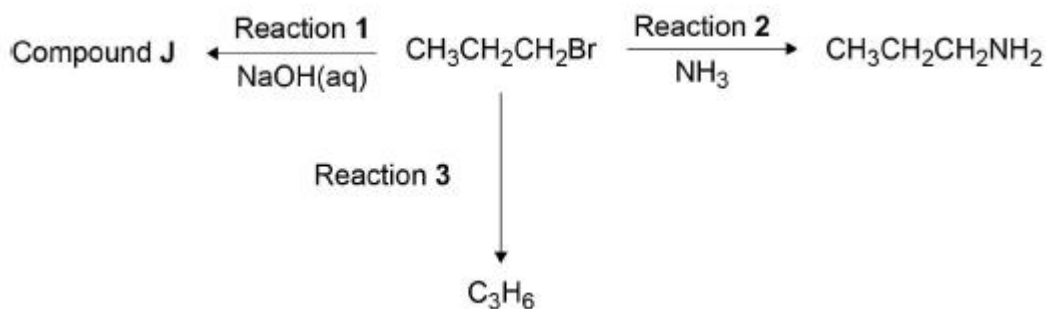
Name of mechanism _____

(2)

(Total 8 marks)

Q2.

The diagram shows some compounds made from a halogenoalkane.



- (a) Draw the displayed formula of compound J.

(1)

- (b) Name the mechanism for Reaction 2 and give an essential condition used to ensure that $\text{CH}_3\text{CH}_2\text{CH}_2\text{NH}_2$ is the major product.

Name of mechanism _____

Condition _____

(2)

- (c) Calculate the mass, in grams, of $\text{CH}_3\text{CH}_2\text{CH}_2\text{NH}_2$ produced from 25.2 g of $\text{CH}_3\text{CH}_2\text{CH}_2\text{Br}$ in Reaction 2 assuming a 75.0% yield.

Give your answer to the appropriate number of significant figures.

Mass _____ g

(3)

- (d) When Reaction 2 is carried out under different conditions, a compound with molecular formula $\text{C}_9\text{H}_{21}\text{N}$ is produced.

Draw the skeletal formula of the compound.

Identify the functional group in the compound including its classification.

Skeletal formula

Functional group including classification _____

(2)

- (e) Identify the reagent and conditions used in Reaction 3.

(1)

- (f) Name and outline a mechanism for Reaction 3.

Name of mechanism _____

Mechanism

(4)

(Total 13 marks)