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

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Name of the Student:_____
Max. Marks : 25 Marks **Time : 25 Minutes**

Q1.

(a) Name compound **Y**, $HOCH_2CH_2COOH$

_____

(1)

(b) Under suitable conditions, molecules of **Y** can react with each other to form a polymer.

(i) Draw a section of the polymer showing **two** repeating units.

(1)

(ii) Name the type of polymerisation involved.

_____

(1)

(c) When **Y** is heated, an elimination reaction occurs in which one molecule of **Y** loses one molecule of water. The organic product formed by this reaction has an absorption at 1637 cm^{-1} in its infrared spectrum.

(i) Identify the bond that causes the absorption at 1637 cm^{-1} in its infrared spectrum.

_____

(1)

(ii) Write the displayed formula for the organic product of this elimination reaction.

(1)

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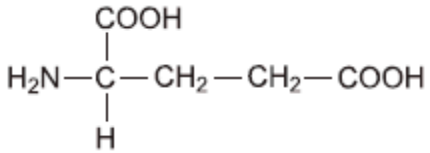
(iii) The organic product from part (ii) can also be polymerised.
Draw the repeating unit of the polymer formed from this organic product.

(1)

(d) At room temperature, 2-aminobutanoic acid exists as a solid.
Draw the structure of the species present in the solid form.

(1)

(e) The amino acid, glutamic acid, is shown below.



Draw the structure of the organic species formed when glutamic acid reacts with each of the following.

(i) an excess of sodium hydroxide

(1)

(ii) an excess of methanol in the presence of concentrated sulfuric acid

(1)

(iii) ethanoyl chloride

(1)

(f) A tripeptide was heated with hydrochloric acid and a mixture of amino acids was formed. This mixture was separated by column chromatography.

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Outline briefly why chromatography is able to separate a mixture of compounds. Practical details are **not** required.

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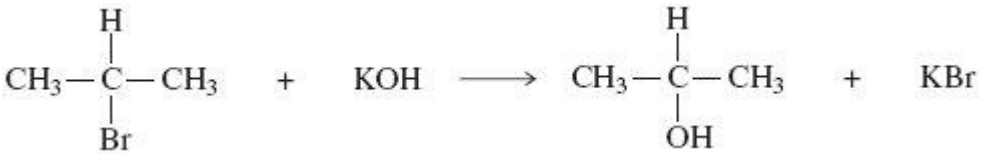
(3)

(Total 13 marks)

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Q2.

(a) Consider the following reaction.



(i) Name and outline a mechanism for this reaction.

Name of mechanism _____

Mechanism

(3)

(ii) Name the haloalkane in this reaction.

_____

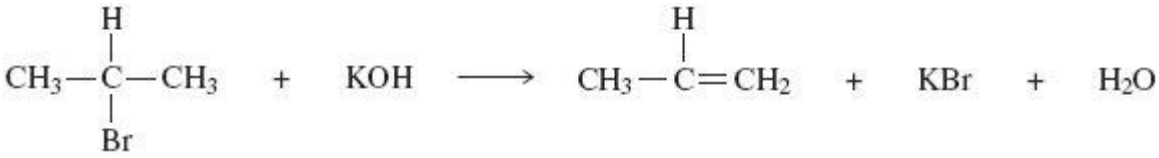
(1)

(iii) Identify the characteristic of the haloalkane molecule that enables it to undergo this type of reaction.

_____

(1)

(b) An alternative reaction can occur between this haloalkane and potassium hydroxide as shown by the following equation.



Name and outline a mechanism for this reaction.

Name of mechanism _____

Mechanism

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(4)

(c) Give **one** condition needed to favour the reaction shown in part (b) rather than that shown in part (a).

_____

(1)

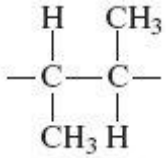
(d) Alkenes can be polymerised to produce poly(alkenes).

(i) State the type of polymerisation that alkenes undergo.

_____

(1)

(ii) Name the alkene that gives a polymer with the repeating unit shown below.



Name of alkene _____

(1)

(Total 12 marks)

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