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

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

Q1.

This question is about fuels.

(a) The petrol fraction obtained from crude oil can be used as fuel in cars.

State the meaning of fraction, as used in the term petrol fraction.

_____

_____

_____

(1)

(b) Hexadecane ($C_{16}H_{34}$) can be cracked at high temperature to form petrol.

Complete the equation to show the cracking of one molecule of hexadecane to form hexane and cyclopentane only.

Give the name of a catalyst used in this cracking reaction.

$C_{16}H_{34} \rightarrow$ _____ + _____

Catalyst _____

(3)

(c) Carbon dioxide is formed when petrol is burned.
Carbon dioxide acts as a greenhouse gas when it absorbs infrared radiation.

Give a reason why carbon dioxide absorbs infrared radiation.

_____

_____

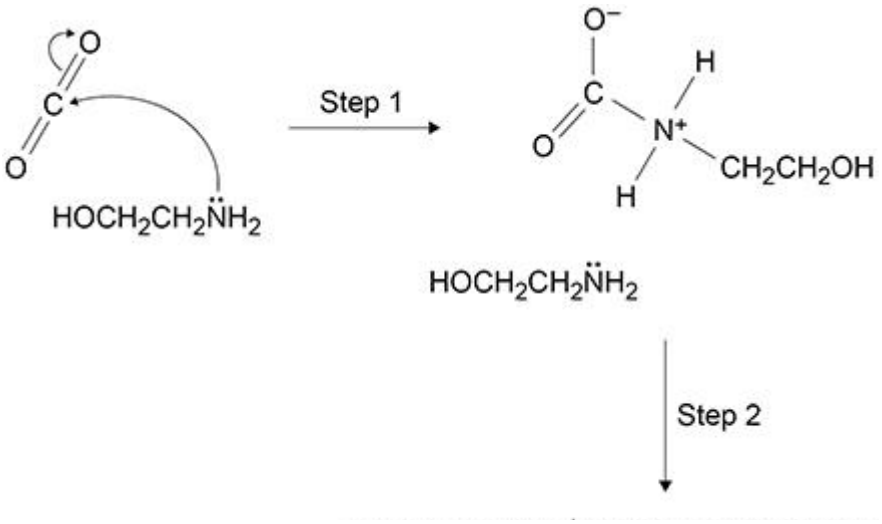
_____

(1)

(d) Compound **Z** ($HOCH_2CH_2NH_2$) can be used to remove carbon dioxide from the mixture of waste gases produced in some power stations.

The figure below shows part of a suggested mechanism for the reaction of **Z** with carbon dioxide.

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Draw **two** curly arrows to complete the mechanism in the figure above.

Name compound **Z** ($HOCH_2CH_2NH_2$)

Deduce the role of **Z** in step **2** of the mechanism.

Name _____

Role _____

_____

(4)

(e) $HOCH_2CH_2NH_2$ can be represented as XNH_2
$[HOCH_2CH_2NH_3]^+$ can be represented as $[XNH_3]^+$

Draw the shape of XNH_2 and of $[XNH_3]^+$

State whether the H–N–H bond angle in XNH_2 is greater than, the same as, or smaller than that in $[XNH_3]^+$

Explain your answer.

Shape of XNH_2 Shape of $[XNH_3]^+$

Bond angle _____

Explanation _____

_____

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(4)

(f) Bioethanol is used as an alternative to fossil fuels.

This statement appeared on a website.

"The fact that bioethanol is a carbon-neutral fuel outweighs the environmental disadvantages of producing bioethanol."

Evaluate this statement.

In your answer you should include:
- an outline of how bioethanol is produced
- relevant equations
- analysis of the environmental impacts.

(6)

(Total 19 marks)

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