

NAME: .....

SCHOOL:.....

DATE: .....

## ORGANIC CHEMISTRY 1

### INSTRUCTIONS TO CANDIDATES

*Answer ALL questions in this paper in the spaces provided.*

1. **Study** the following information and answer the questions below.

Number of carbon atoms per molecule	Relative molecular mass of hydrocarbon
2	26
3	40
4	54

(a) **Determine** the general formula of the hydrocarbons and the homologous series they belong to. (2marks)

(b) **Draw** the structure formula of the fourth number of the series.

(1mark)

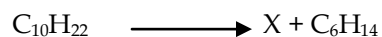
2.a) when a hydrocarbon fuel is burnt, one of the main products is slightly acidic gas R. What is the name of gas R? (1mk)

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b) State two processes in which gas R is produced in nature. (2mks)

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3. A hydrocarbon undergoes the process represented by the equation below to produce two other hydrocarbons.



(a) **Name** the process undergone by the hydrocarbon. (1mk)

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(b) **State one** condition necessary for the process. (1mk)

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.....

(c) To which homologous series does substance **X** belong? (1mk)

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4. Study the table below and answer the questions that follow.

Bond type	Bond energy KJmol <sup>-1</sup>
C - C	346
C = C	610
C - H	413
C - Br	280
Br - Br	193

(d) Calculate the heat change for the reaction;



(e) Name the type of reaction that occurred in (a) above. (1mk)

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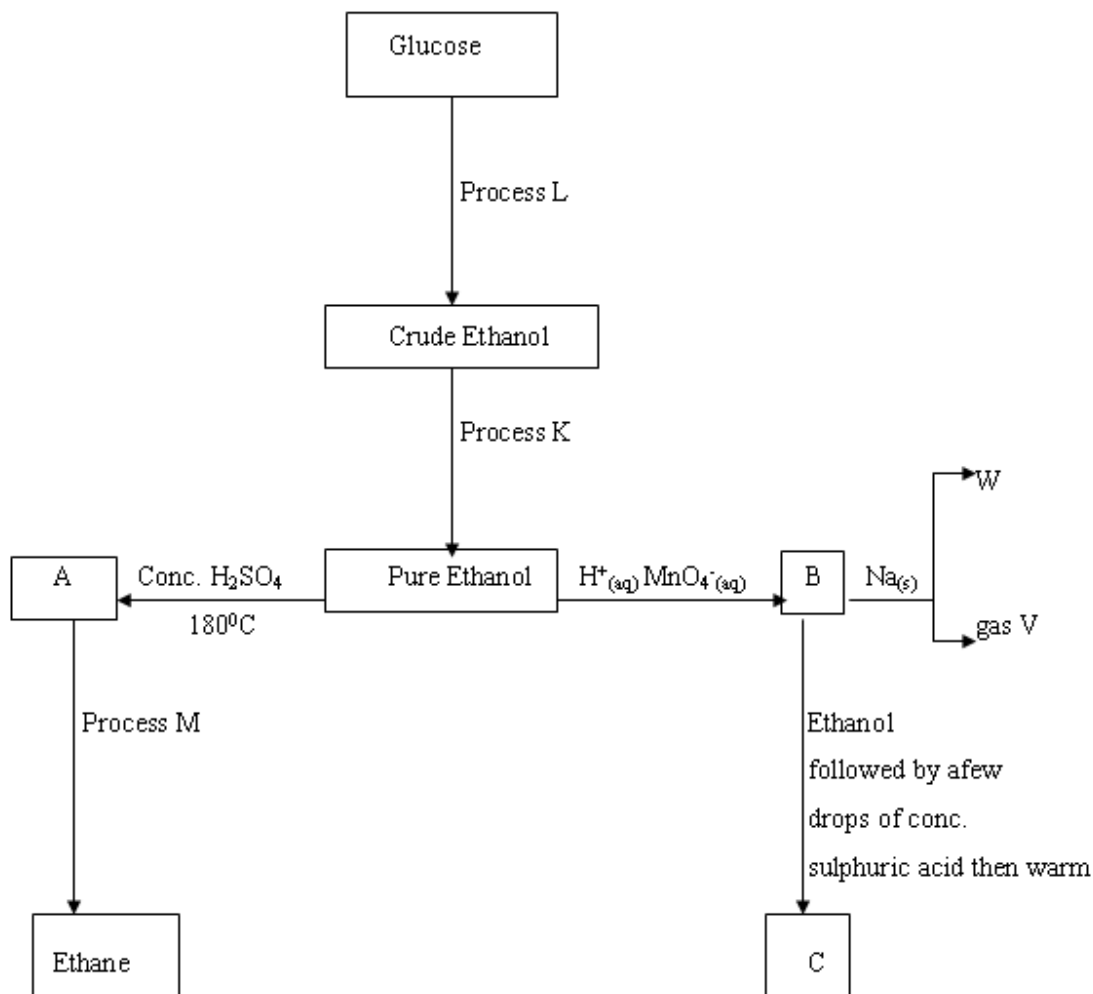
5. 3.10g of a compound of carbon, oxygen and hydrogen produced 4.40g of Carbon (IV) Oxide and 2.70g of water on complete combustion in oxygen. Determine the empirical formula of the compound. (C = 12.0, H = 1.0, O = 16.0) [3m]

6. Give the **name** and draw the structure formula of the compound formed when one mole of ethyne reacts with one mole of chlorine gas. [2m]

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5. The reaction scheme below has glucose as the starting material.



a) Identify substances labeled (1mk)

A

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B

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b) Give the name of the processes labelled (1mk)

L

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K

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c) Identify the reagent and conditions necessary for the process M. (2mks)

Reagent

.....

.....

Condition

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.....

d) Write the structural formula of substance C. (1mk)

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e) To which homologous series does substance A belong. (1mk)

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f) Write an equation for the reaction between B and sodium metal forming substances W and gas V. (1mk)

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g) What is observed when a few drops of Bromine water are added to a small sample of substance A? Explain your answer. (2mks)

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h) Give one industrial application of process M.

(1mk)

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