



Province of the
EASTERN CAPE
EDUCATION

O.R. TAMBO INLAND DISTRICT

GRADE 12

PHYSICAL SCIENCES
TOPIC TEST: ORGANIC CHEMISTRY (NOMENCLATURE)

FEBRUARY 2025

MARKS: 40

DURATION: 48 MINUTES

QUESTION 1: MULTIPLE-CHOICE QUESTIONS

Four possible options are provided as answers to the following questions. Each question has only ONE correct answer. Choose the best answer and make a cross (X) in the correct block (A – D) next to the question number (3.1 – 3.5) on the attached ANSWER SHEET:

1.1 Which ONE of the following gases will not decolourise a bromine solution through an addition reaction?

- A. Ethene
- B. Ethane
- C. Ethyne
- D. Chloroethene

(2)

1.2 Which ONE of the following compounds has the formula $C_2H_4O_2$?

- A. Ethanol
- B. Ethanal
- C. Ethanoic acid
- D. Ethyl methanoate

(2)

QUESTION 2 (Start on a new page.)

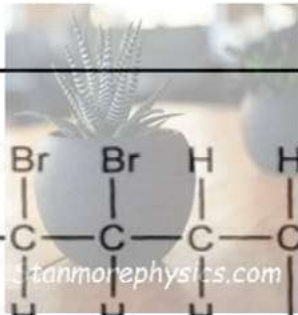
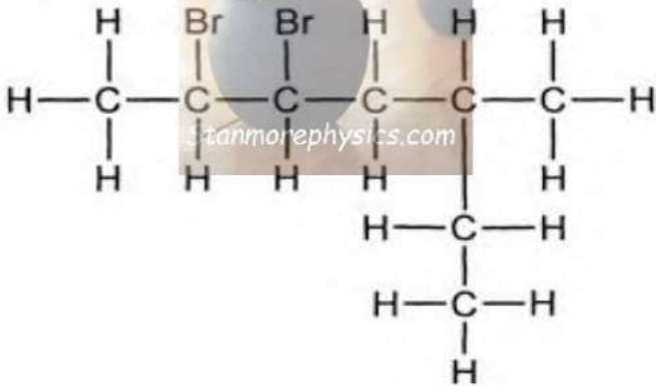
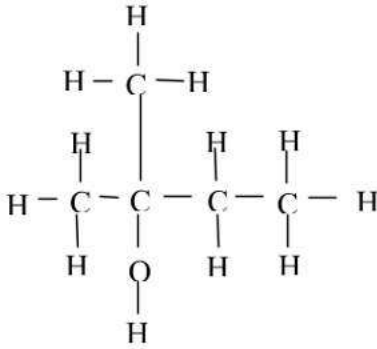
As human beings we make use of many organic compounds in our daily lives. In the table below the letters A to E represent a few of these compounds.

	COMPOUND
A	$\text{H} - \text{C} \equiv \text{C} - \text{H}$
B	$ \begin{array}{ccccc} & \text{H} & & \text{O} & & \text{H} \\ & & & & & \\ \text{H} & - \text{C} & - & \text{C} & - & \text{C} & - \text{H} \\ & & & & & \\ & \text{H} & & & & \text{H} \end{array} $
C	pent-1-ene
D	2,2,4-trimethylhexane
E	Methylpropanoate

- 2.1 Write down the IUPAC name of compound B. (1)
- 2.2 Write down the structural formula of compound C. (2)
- 2.3 Write down a homologous series of compound A. (1)
- 2.4 Write down the name of the FUNCTIONAL GROUP of compound B. (1)
- 2.5 Write down the IUPAC name of organic ACID used to prepare compound E (2)
- 2.6 Write down the structural formula of compound D. (2)
- 2.7 Refer to compound B
- 2.7.1 write down the condensed structural formula and IUPAC name Of a structural isomer of compound B (4)
- 2.7.2 define the type of structural isomer in question 2.7.1 (2)
- 2.8 For compound D, write down a balanced equation using molecular formulae, for its complete combustion reaction (3)
- 2.9 Use condensed structural formulae to write down a balanced equation for a preparation of compound E (5)

QUESTION 3 (Start on a new page.)

Millions of organic compounds are known to date. Four of these compounds, represented by the letters **P**, **Q**, **R** and **S**, are shown in the table below.

<p>P</p>	<p>methene</p> 	<p>Q</p>	$ \begin{array}{cccc} & \text{H} & \text{H} & \text{O} & \text{H} \\ & & & & \\ \text{H} & - \text{C} & - \text{C} & - \text{C} & - \text{C} - \text{H} \\ & & & & \\ & \text{H} & \text{H} & & \text{H} \end{array} $
<p>R</p>		<p>S</p>	

3.1 Write down the following:

- 3.1.1 General formula of **P** (1)
- 3.1.2 Homologous series to which **Q** belongs (1)
- 3.1.3 Structural formula of an isomer of **Q** (2)
- 3.1.4 IUPAC name of **R** (3)

3.2 **S** represents an alcohol. Classify this alcohol as primary, secondary or tertiary. (2)

Explain the answer

3.3 **Compound P** is bubbled through bromine water, Br_2 in a conical flask, **THE REACTION IS CARRIED OUT IN A DARKENED ROOM.**

Science student concluded that, reddish brown colour of bromine water, Br_2 **IMMEDIATELY TURNS COLOURLESS** during the reaction.

Is the conclusion of a science student CORRECT? Write down YES or NO explain the answer (4)



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PHYSICAL SCIENCES TOPIC TEST

MARKING GUIDELINE

TOPIC: ORGANIC CHEMISTRY

(NOMENCLATURE)

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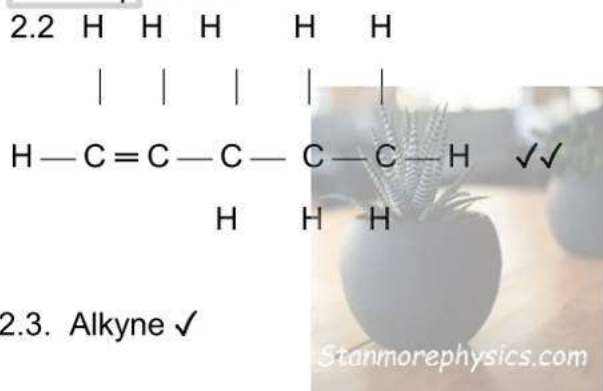
QUESTION 1

- 1.1 B ✓✓ (2)
 1.2 C ✓✓ (2)

[4]

QUESTION 2

2.1 Propanone ✓ (1)

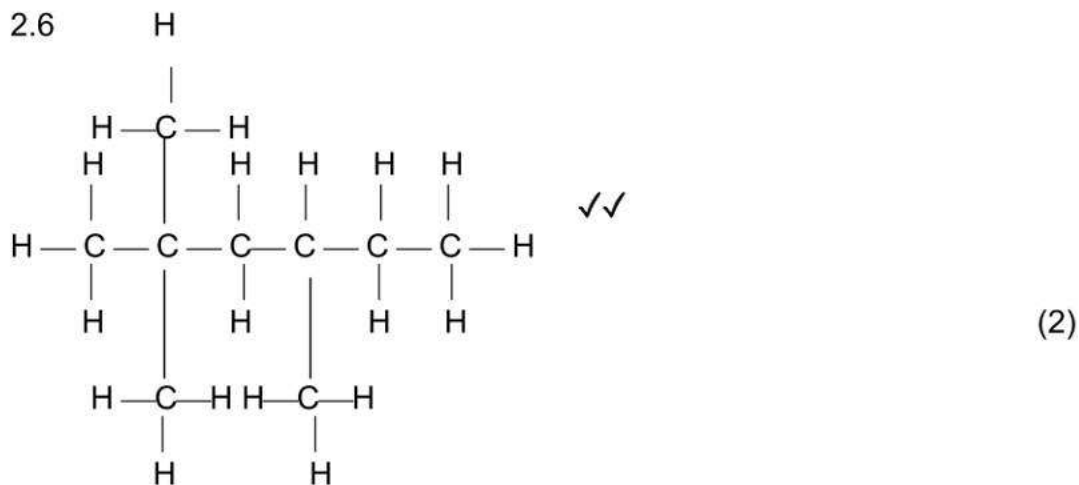


(2)

2.3. Alkyne ✓ (1)

2.4 Carbonyl group ✓ (1)

2.5 Propanoic acid ✓✓ (2)



(2)

2.7.1 $\text{CH}_3\text{CH}_2\text{CHO}$ ✓✓ PROPANAL ✓✓ (4)

2.7.2 Same molecular formula but different functional group ✓✓ (2)

2.8 $\text{C}_9\text{H}_{20} + 14\text{O}_2 \rightarrow 9\text{CO}_2 + 10\text{H}_2\text{O}$ ✓✓✓ (3)

2.9 CH_3OH ✓ + $\text{CH}_3\text{CH}_2\text{COOH}$ ✓ $\rightarrow \text{CH}_3\text{CH}_2\text{COOCH}_3$ ✓✓ + H_2O ✓ (5)

[23]



QUESTION 3

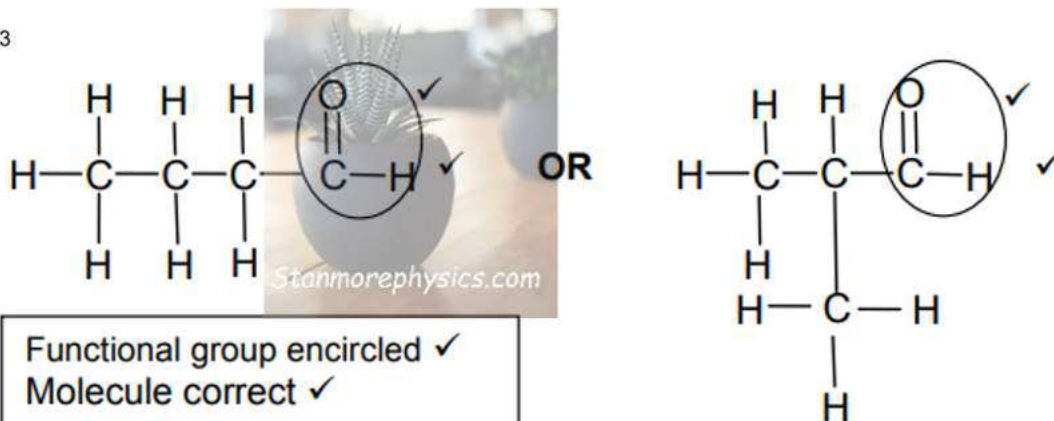
3.1.1 C_nH_{2n} ✓

(1)

3.1.2 ketones ✓

(1)

3.1.3



Functional group encircled ✓
Molecule correct ✓

Condensed or semi-structural formula: Max. $\frac{1}{2}$

Molecular formula: $\frac{0}{2}$

3.1.4 3,3-dibromo-5-methylheptane ✓✓✓

(3)

3.2 Tertiary ✓

(C-Atom bonded to -O-H is bonded to three other C-atoms) ✓

(2)

3.3 YES ✓

- Compound P/methane is unsaturated or have a double bond ✓
- Type of reaction is an addition reaction ✓
- No reaction condition (heat/sunlight) needed for reaction to takes place ✓

(4)

[13]