LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF
EDUCATION

MOGALAKWENA DISTRICT

PHYSICAL SCIENCES

GRADE 12

NATIONAL SENIOR CERTIFICATE

TOPIC TEST
NOMENCLATURE
2026 TERM 1

MARKS: 40 **DURATION: 40 Min**

INSTRUCTIONS

1. Answer all questions.
2. Non-programmable calculators may be used.
3. Number the questions correctly according to the numbering system used in this activity.

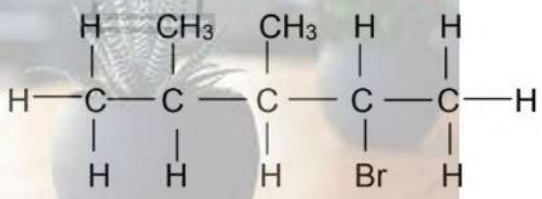
This question paper consists of THREE questions of one topic on five pages including the cover page.

TOPIC: NOMENCLATURE

MARKS: 40 **DURATION: 40 Min**

QUESTION 1

1.1 Consider the compound shown below: (2)



The CORRECT IUPAC name of the above compound is:

A 4-bromo-2,3-dimethylpentane

B 2-bromo-3,4-dimethylpentane

C 2,3-dimethyl-4-bromopentane

D 3,4-dimethyl-2-bromopentane

1.2 Consider the condensed structural formula: (2)

CH_3COCH_3

Identify the name of the functional group in this formula.

A Carboxylic acid

B Carboxyl group

C Ketone

D Carbonyl group

1.4 Which of the following is the empirical formula of 1,2-dichloroethane? (2)

A CHCl

B CH_2Cl

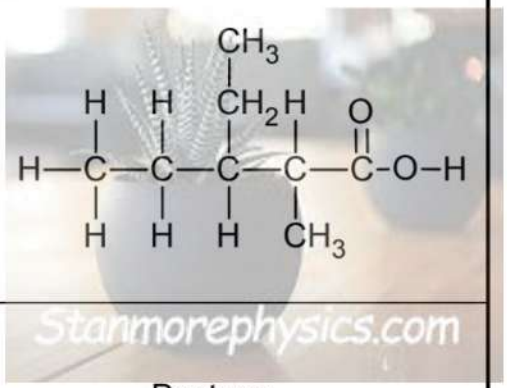
C $CHCl_2$

D $C_2H_4Cl_2$

[6]

QUESTION 2

The letters A to D in the table below represent four organic compounds that belong to different homologous series.

A 2-methylpropanal	**B** 
C $CH_3C \equiv CCH_2CH_3$	**D** Pentane

2.1 Define the term homologous series. (2)

2.2.1 General formula of the homologous series to which compound C Belongs (1)

2.2.2 Structural formula of compound A (2)

2.3 Write down the IUPAC name of compound B. (3)

2.4 Compound D has three structural isomers.
Write down the:

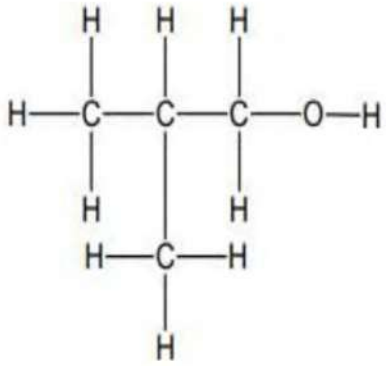
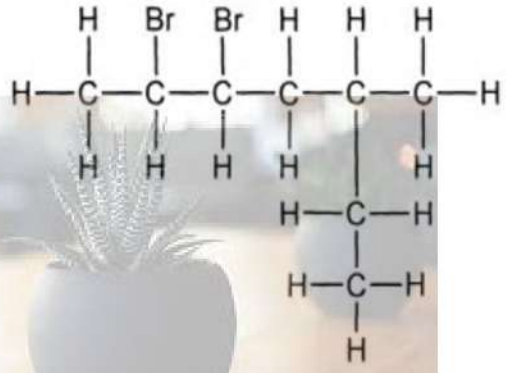
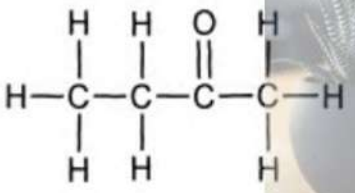
2.4.1 Structural formula of the isomer with the shortest chain (3)

2.4.2 Balanced equation for the combustion reaction of compound D in EXCESS oxygen using molecular formulae (3)

[14]

QUESTION 3:

The letters A to F in the table below represent six organic compounds.

A	$CH_3CH_2CH_2CH_3$	**B**	Butanal
C		**D**	
E		**F**	CxHyOz

3.1 Is compound A, a SATURATED or an UNSATURATED hydrocarbon? (2)
Give a reason for the answer.

3.2 Write down the LETTER/S that represent(s) each of the following:

3.2.1 A ketone (1)

3.2.2 A halo-alkane (1)

3.2.3 The two functional isomers (1)

3.3 Consider compound C:

3.3.1 Is compound C a PRIMARY, SECONDARY or TERTIARY alcohol? (2)
Give a reason for the answer.

3.3.2 Write down the STRUCTURAL FORMULA and IUPAC name of a chain isomer of compound C. (2)

3.4 Write down the:

3.4.1 IUPAC name for compound D (2)

3.4.2 NAME of the functional group of compound B (1)

3.5 A sample of compound F contains 40% C; 53,3% O and X% H.

3.5.1 If the molar mass is 60 g·mol-1, calculate the MOLECULAR FORMULA of compound F. (4)

3.5.2 Write down the IUPAC names of the two organic compounds that will have this molecular formula. (2)

3,5,3 Write the condensed structural formula of compound D (2)

[20]

TOTAL MARKS = [40]

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TOPIC TEST
NOMENCLATURE
MEMORANDUM
2026 TERM 1

INSTRUCTIONS

1. Mark accurately
2. Put ticks and crosses on appropriate points
3. Ticks and crosses must NOT be over the learners' answers
4. Convert totals to percentages and to levels

This *MEMORANDUM* consists of THREE questions of one topic on FIVE pages including the cover page.

TOPIC 1:

QUESTION 1

1.1 B ✓✓ (2)

1.2 D ✓✓ (2)

1.3 D✓✓ (2)

[6]

QUESTION 2

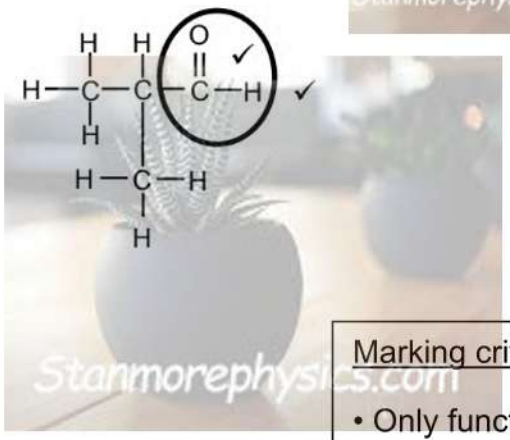
2.1 It is a series of organic compounds that can be described by the same general formula.✓✓ (2)

OR/OF

A series/group of organic compounds in which one member differs from the next with -CH2- group. ✓✓

2.2.1 CnH2n-2✓ (1)

2.2.2 (2)



Marking criteria

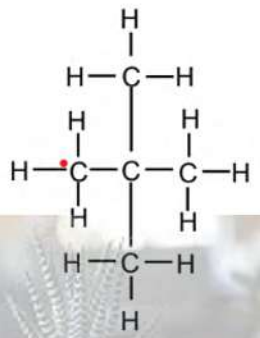
- Only functional group correct Max 1/2
- Whole structure correct 2/2

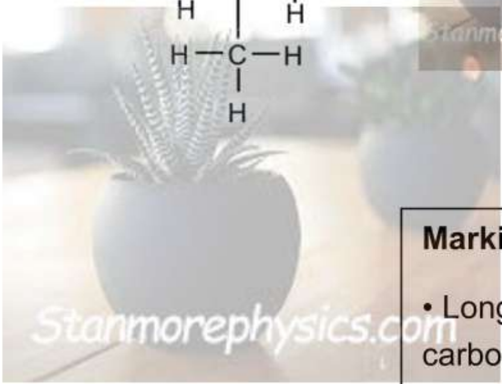
2.3 3-ethyl-2-methylhexanoic acid✓ (3)

Marking criteria

- Correct stem i.e hexanoic acid ✓
- All substituents (ethyl and methyl) correctly identified ✓
- IUPAC name completely correct including numbering, sequence and hyphens ✓

2.4.1 (3)





Marking criteria

- Longest chain contains 3 carbons ✓
- Two methyl substituents on C2 ✓
- Whole structure is correct ✓

2.4.2 $C_5H_{12} + 8\ O_2$ ✓ → $6\ H_2O + 5\ CO_2$ ✓ (bal ✓) (3)

Marking criteria

- Reactants
- Products
- Balancing

[14]

QUESTION 3:

3.1 Saturated ✓ (2)

Only single bonds between C-atoms/No multiple bonds between C-atoms. ✓

3.2.1 E ✓ (1)

3.2.2 D ✓ (1)

3.2.3 B & E✓ (1)

3.3.1 Primary ✓ (2)

The carbon that is bonded to the hydroxyl group (OH) is bonded to one carbon atom. ✓

3.3.2 (2)

✓

MARKING CRITERIA

- correct whole structure
- correct IUPAC name

3.4.1 ✓ ✓ (2)

2,3-dibromo-5-methylheptane

3.4.2 Formyl ✓ group (1)

3.5.1 (4)

100 – (40 + 53,3) = 6,7

	C:	H	O
$n = \frac{m}{M}$	$\frac{40}{12}$	$\frac{6,7}{1}$	$\frac{53,3}{16}$
	$\frac{3,33}{3,33}$	$\frac{6,67}{3,33}$	$\frac{3,33}{3,33}$
	1	2	1

CH_2O

Molar mass of CH_2O = 30 g·mol-1

60 ÷ 30 = 2 ✓

∴ $C_2H_4O_2$ ✓

MARKING CRITERIA

- 6,7✓
- Divide by smallest number✓

(NOTE: If only formula given, award ¼)

3.5.2 Ethanoic acid✓ (2)

Methyl methanoate✓

3.5.3 (2)

$CH_3CHBrCHBrCH_2CHCH_3$✓

CH_2CH_3✓

[20]

TOTAL MARKS = [40]