



VHEMBE WEST

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

PHYSICAL SCIENCES

TOPIC TEST 1

Stanmorephysics.com
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MARKS: 50

TIME: 1 hour

This question paper consists of 6 pages and 1 data sheet.

INSTRUCTIONS AND INFORMATION



1. Write your NAME and school name on your answer paper.
2. This question paper consists of THREE (3) questions. Answer ALL the questions in the ANSWER PAPER.
3. Start EACH question on a NEW page in the ANSWER PAPER.
4. Number the answers correctly according to the numbering system used in this question paper.
5. Leave ONE line between two subquestions, for example between QUESTION 2.1 and QUESTION 2.2.
6. You may use a non-programmable calculator
7. You may use appropriate mathematical instruments.
8. You are advised to use the attached DATA SHEETS.
9. Show ALL formulae and substitutions in ALL calculations.
10. Round off your FINAL numerical answers to minimum of TWO decimal places.
11. Give brief motivations, discussions, et cetera where required.
12. Write neatly and legibly.

QUESTION 1: MULTIPLE-CHOICE QUESTIONS

Various options are provided as possible answers to the following questions. Each question has only ONE correct answer. Choose the answer and write only the letter (A-D) next to the question number (1.1 – 1.5) in the ANSWER PAPER, for example **1.6 E**

1.1 To which homologous series does a compound with molecular formula $C_6H_{12}O_2$ belong?

- A Ketones
- B Carboxylic acids
- C Aldehydes
- D Alcohols (2)

1.2 Which ONE of the following pairs of compounds are FUNCTIONAL isomers?

- A Methanol and methanal
- B Butane and 2-methylpropane
- C Propan-1-ol and propan-2-ol
- D Propanoic acid and methyl ethanoate (2)

1.3 Which ONE of the following compounds belongs to the same homologous series as but-2-yne?

- A CH_3CCH
- B CH_2CHCH_2
- C $CH_3CHCHCH_3$
- D $CH_3CH_2CH_2CH_3$ (2)

QUESTION 2

A to G in the table below represent seven organic compounds.

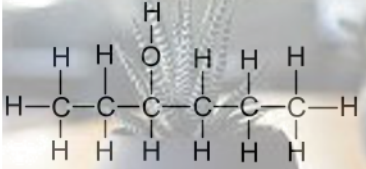
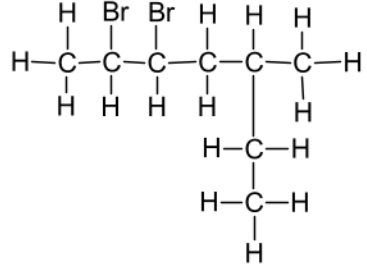
A	3-methylpent-1-yne	B	$\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CHO}$
C	$ \begin{array}{cccccc} & \text{H} & \text{H} & \text{H} & \text{H} & \text{O} \\ & & & & & \\ \text{H} & - \text{C} & - \text{C} & - \text{C} & - \text{C} & - \text{O} \\ & & & & & \\ & \text{H} & \text{H} & \text{H} & \text{H} & \text{H} \end{array} $	D	$ \begin{array}{ccc} & \text{H} & \text{H} \\ & & \\ \text{H} & - \text{C} & - \text{C} & - \text{H} \\ & & \\ & \text{H} & \text{H} \end{array} $
E	$ \begin{array}{cccccc} & \text{H} & \text{C}_2\text{H}_5 & \text{H} & \text{H} & \text{H} \\ & & & & & \\ \text{H} & - \text{C} & - \text{C} & - \text{C} & - \text{C} & - \text{C} & - \text{H} \\ & & & & & \\ & \text{H} & \text{H} & \text{H} & \text{Br} & \text{H} \end{array} $	F	2-methyl-2-pentanol
G	$\text{CH}_3\text{CH}_2\text{OOCCH}_2\text{CH}_2\text{CH}_3$		

- 2.1 Define the term *homologous series*. (2)
- 2.2 Write down the GENERAL FORMULA of the homologous series to which compound D belongs. (1)
- 2.3 Write down the IUPAC name of the following compounds:
- 2.3.1 C (2)
- 2.3.2 E (3)
- 2.4 Write down the:
- 2.4.1 STRUCTURAL FORMULA of the compound A (3)
- 2.4.2 STRUCTURAL FORMULA of the compound G (2)
- 2.5 For compound B, write down the:
- 2.5.1 NAME of the functional group to which it belongs (1)
- 2.5.2 STRUCTURAL FORMULA of its FUNCTIONAL isomer (1)
- 2.6 Compound F is an alcohol.
- 2.6.1 Is compound F a PRIMARY, SECONDARY or TERTIARY alcohol? (1)
- 2.6.2 Give a reason for the answer to QUESTION 2.6.1. (2)

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QUESTION 3

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

A		B	
C	$\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{COOH}$	D	$\text{CH}_3\text{CH}_2\text{CH}(\text{CH}_3)\text{CH}_2\text{CH}_3$
E	4-methylpentan-2-one	F	Ethyl butanoate

- 3.1 Is compound **D** SATURATED or UNSATURATED?
Give a reason for the answer. (2)
- 3.2 Define the term *functional isomers*. (2)
- 3.3 Write down the letters that represent two compounds that are functional isomers. (2)
- 3.4 Write down the homologous series to which compound **C** belong. (1)
- 3.5 Write down the IUPAC name of:
- 3.5.1 Compound **B** (3)
- 3.5.2 Compound **D** (2)
- 3.6 Write down the structural formula of:
- 3.6.1 The functional group of compound **F** (1)
- 3.6.2 Compound **E** (3)
- 3.7 Is compound **A**, a PRIMARY, SECONDARY or TERTIARY alcohol?
Give a reason for the answer. (2)
- 3.8 Write down the NAME and FORMULA of a catalyst needed for the preparation of compound **F**. (2)

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TOTAL = 50 MARKS

