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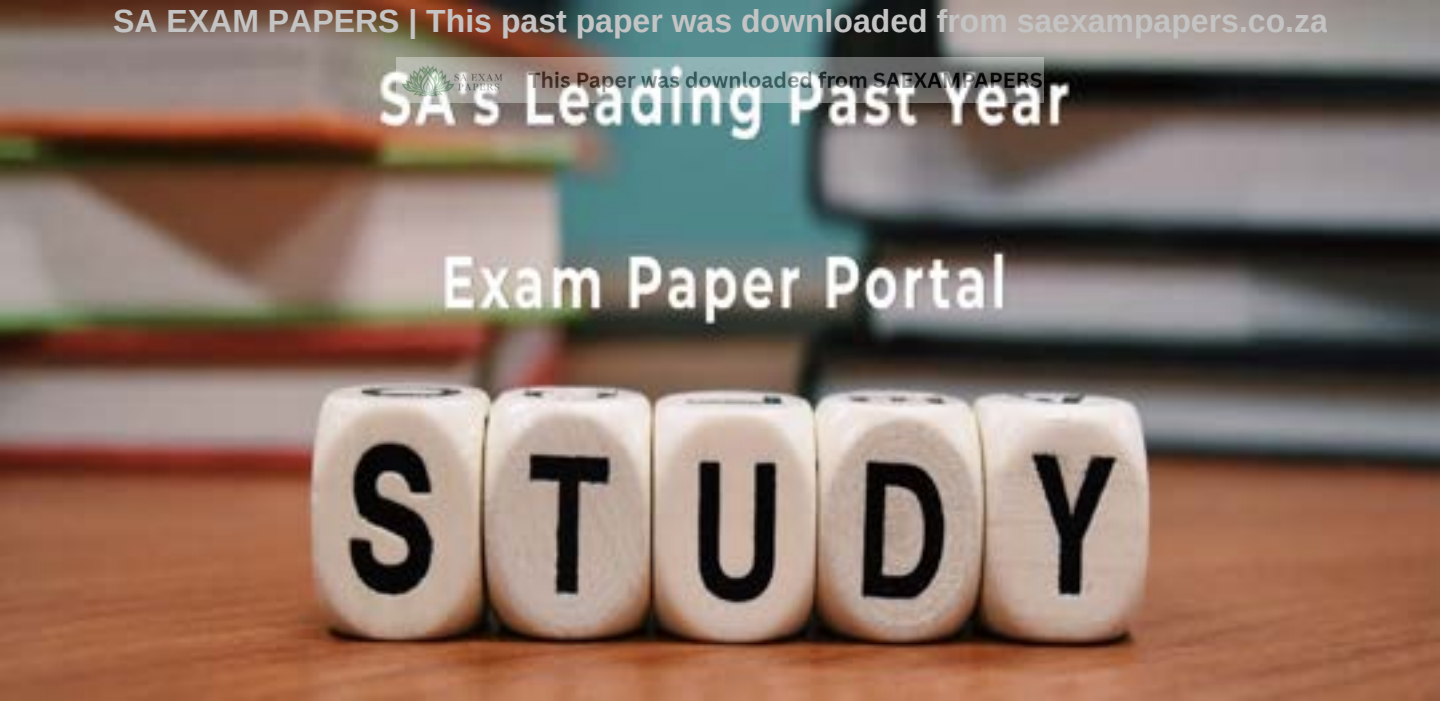


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Department:
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North West Provincial Government
REPUBLIC OF SOUTH AFRICA

**PROVINCIAL ASSESSMENT**
***PROVINSIALE ASSESSERING***

**GRADE/*GRAAD* 12**

**TECHNICAL SCIENCES P2/*TEGNIESE WETENSKAPPE V2***

**JUNE/*JUNIE* 2025**

**MARKING GUIDELINES/*NASIENRIGLYNE***

**MARKS/*PUNTE*: 75**

**These marking guidelines consists of 7 pages.**
***Hierdie nasienriglyne bestaan uit 7 bladsye***

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**QUESTION/*VRAAG* 1:**

1.1 C ✓✓ (2)

1.2 A ✓✓ (2)

1.3 C ✓✓ (2)

1.4 B ✓✓ (2)

1.5 A ✓✓ (2)
**[10]**

**QUESTION/*VRAAG* 2**

2.1 2.1.1 Organic compounds containing only carbon atoms and hydrogen ✓✓
*Organiese verbindings wat slegs koolstofatome en waterstofatome bevat.* (2)

2.1.2 An atom or a group of atoms that determine the chemistry of a molecule ✓✓
**OR**
An atom or group of atoms that determine(s) the physical and chemical properties of a group of organic compounds

*'n Atoom of 'n groep atome wat die chemie van 'n molekuul bepaal*
***OF***
*'n Atoom of 'n groep atome wat die fisiese en chemiese eienskappe van 'n groep organiese verbindings bepaal* (2)

2.2 2.2.1 **A** ✓ and **B** ✓ (2)

2.2.2 **F** ✓ (1)

2.2.3 **E** ✓ (1)

2.2.4 **C** ✓ and **D** ✓ (2)

2.3 2.3.1 Butan ✓-2-ol ✓ (2)

2.3.2 Propanone/*Propanoon* ✓✓ (2)

2.3.3 Ethyl ✓ propanoate ✓
*Etiel propanoaat* (2)

2.4 2.4.1 $C_nH_2O$ ✓ (1)

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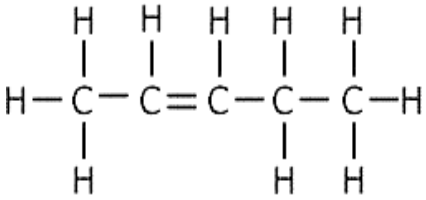
2.4.2 $C_nH_{2n}O_2$ ✓ (1)

2.5 2.5.1

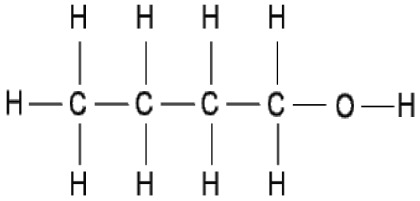


**Marking criteria**
- ✓ Correct functional group
- ✓ Whole structure correct
- If a bond or hydrogen is missing ½

***Nasien kriteria***
- ✓*Korrekte funksionele groep*
- ✓*Hele struktuur korrek*
- *Indien 'n verbinding of waterstof kort ½*

(2)

2.5.2



**Marking criteria**
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***Nasien kriteria***
- ✓ *Korrekte funksionele groep*
- ✓ *Hele struktuur korrek*
- *Indien 'n verbinding of waterstof kort ½*

(2)

2.6 A large molecule composed of smaller monomer units covalently bonded to each other in a repeatly pattern. ✓✓

*'n Groot molekuul wat uit kleiner monomeer-eenhede bestaan wat kovalent aan mekaar in 'n herhalende patroon gebind is* (2)

2.7 Polythene/*Politeen* ✓ (1)
**[25]**

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**QUESTION/VRAAG 3**

3.1 The pressure exerted by a vapour at equilibrium with it's liquid in a closed system. ✓✓

*Die druk uitgeoefen deur 'n damp in ewewig met sy vloeistof in 'n geslote sisteem. Hoe sterker die intermolekulêre kragte, hoe laer die dampdruk.* (2)

3.2 Primary alcohol ✓
The (-OH) hydroxyl group is attached to a primary carbon. ✓
**OR**
The hydroxyl group (-OH) is bonded to only one other carbon atom.

*Primêre alkohol*
*Die (-OH) hidroksied groep is op die primêre koolstof*
***OF***
*Die hidrolsiel groep (-OH) is verbind met slegs een ander koolstofatoom*. (2)

3.3 3.3.1 Dispersion/London Forces ✓
*Dispersie/London Kragte* (1)

3.3.2 Hydrogen bond/*Waterstofverbindings* ✓ (1)

3.4 Compound **A** / Propane ✓
*Verbinding **A** / Propaan* (1)

3.5 Ethanoic acid ✓
*Etanoësuur* (1)

3.6 Consists of TWO sites for hydrogen bonding ✓ and has stronger intermolecular force than compound **A** and **B**. ✓
***OR***
The stronger the intermolecular forces, the higher the boiling point. The stronger the intermolecular forces, the lower the vapour pressure.

*Bestaan uit TWEE waterstofbindings plekke en het sterk intermolekulêre kragte tussen verbinding **A** en **B***
***OF***
*Hoe sterker die intermolekulêre kragte, hoe hoër die kookpunt. Hoe sterker die intermolekulêre kragte, hoe laer die dampdruk.* (2)

3.7 Molecules that have the same molecular formular but different types of chains. ✓✓

*Molekule met dieselfde molekulêre formule, maar verskillende struktuurformules* (2)

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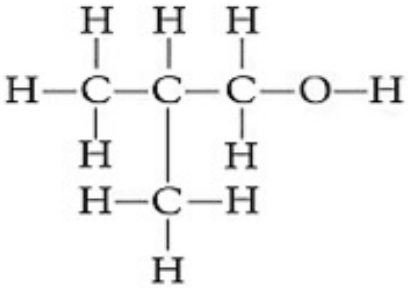
3.8



**Marking criteria**
- ✓ Correct functional group
- ✓ Whole structure correct
- If a bond or hydrogen is missing ½

***Nasien kriteria***
- ✓*Korrekte funksionele groep*
- ✓*Hele struktuur korrek*
- *Indien 'n verbinding of waterstof kort ½*

(2)
**[14]**

**QUESTION/*VRAAG* 4**

4.1 4.1.1 Hydrohalogenation/*Hidrohalogenering* ✓ (1)

4.1.2 Hydration/*Hidrasie* ✓ (1)

4.2 Substitution reaction/*Substutisie reaksie* ✓ (1)

4.3 4.3.1 Butane/*Butaan* ✓ (1)

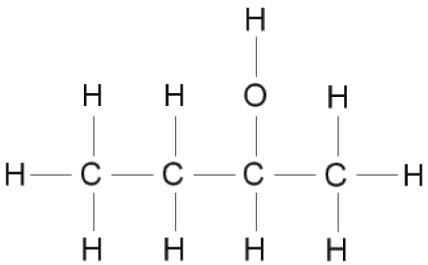
4.3.2 Bromobutane ✓/ 1-bromobutane
*Bromobutaan / 1-bromobutaan* (1)

4.3.3 Butan-2-ol ✓ (1)

4.4 4.4.1 Pt/ Pd/ Ni as a catalyst ✓
*Pt/Pd/Ni as 'n katalisator* (1)

4.4.2 No water must be present ✓
*Geen water moet teenwoordig wees nie* (1)

4.5



**Marking criteria**
- ✓ Correct functional group
- ✓ Whole structure correct
- If a bond or hydrogen is missing ½

***Nasien kriteria***
- ✓*Korrekte funksionele groep*
- ✓*Hele struktuur korrek*
- *Indien 'n verbinding of waterstof kort ½*

(2)

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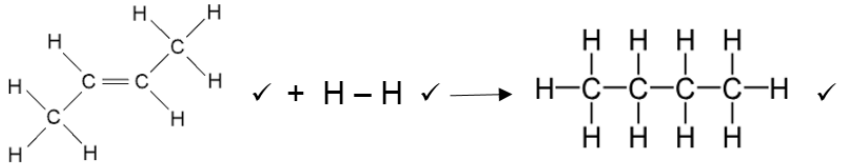
4.6 4.6.1




| **Marking criteria/*Nasien kriteria*** |
|---|
| • 1 mark for the reactants/*1 punt vir reaktante* |
| • 1 mark for functional group of alkene/*1 punt vir funksionele groep van alkeen* |
| • 1 mark for Butane/*1 punt vir Butaan* |
| • **NOTE**: Penalise 1 mark if condensed structural/molecular formula for butene is given. |
| • ***NOTA:*** *Penaliseer 1 punt indien gekondenseerde strukturele/molekulêre formule vir buteen gegee is.* |

(3)

4.7 4.7.1 Combustion / Oxidation ✓
*Verbringing/ Oksidasie* (1)

4.7.2 $2C_3H_6 + 9O_2$ ✓ $\longrightarrow 6CO_2 + 6H_2O$ + **energy** ✓ Balancing ✓ (3)

4.8
- Combustion of fuel source in applications where high heat is needed ✓
- In engines of cars, bikes and automobiles
- In generators to generator electricity
- Powering industrial equipment
- Blowtorches
- Gas stoves **(Any one)**

- *Verbranding van brandstof in toerusting waar hoë hitte benodig word*
- *In motorenjins, motorfietse en motors*
- *In generators om elektrisiteit te genereer*
- *Aandryf van industriële toerusting*
- *"Blowtorches"*
- *Gasstowe* ***(Enige een)***

(1)
**[18]**

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**QUESTION/*VRAAG* 5**

5.1 5.1.1 A material which has electrical conductivity between that of a conductor and an insulator. ✓ ✓

*'n Materiaal met 'n elektriese geleidingsvermoë tussen dié van 'n geleier en 'n isolator* (2)

5.1.2 Pure semiconductor. ✓ ✓
*Suiwer halfgeleier* (2)

5.2 The positive terminal of the battery must be connected to the p-type material ✓ and the negative terminal of the battery must be connected to the n-type material. ✓

*Die positiewe terminaal van die battery moet gekoppel wees met die p-tipe materiaal en die negatiewe terminaal van die battery moet gekoppel wees met die n-tipe materiaal.* (2)

5.3 Silicon (Si) ✓
Germanium (Ge) ✓ (2)
**[8]**

**TOTAL/TOTAAL: 75**

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