Province of the
EASTERN CAPE
EDUCATION

NATIONAL SENIOR CERTIFICATE/ *NASIONALE SENIOR SERTIFIKAAT*

GRADE/*GRAAD* 12

JUNE/*JUNIE* 2021

TECHNICAL SCIENCES P2/ *TEGNIESE WETENSKAPPE V2* MARKING GUIDELINE/*NASIENRIGLYN* (EXEMPLAR/*EKSEMPLAAR*)

MARKS/*PUNTE*: 75

This marking guideline consists of 5 pages/
Hierdie nasienriglyn bestaan uit 5 bladsye.

QUESTION/*VRAAG* 1

1.1 D ✓✓ (2)
1.2 C ✓✓ (2)
1.3 B ✓✓ (2)
1.4 A ✓✓ (2)
1.5 B ✓✓ (2)
[10]

QUESTION/*VRAAG* 2

2.1 Combustion / *verbranding* ✓ (1)

2.2 Structural isomers / *struktuurisomere* ✓ (1)

2.3 Polymers / *polimere* ✓ (1)

2.4 n-type (semiconductor) / *n-tipe (halfgeleier)* ✓ (1)
[4]

QUESTION/*VRAAG* 3

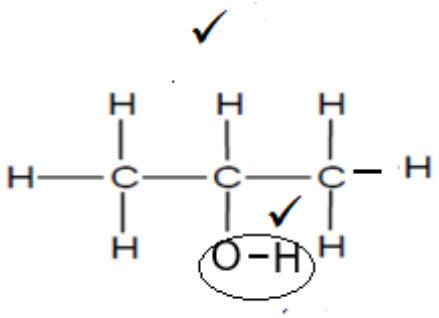
3.1 3.1.1 An organic molecule is a molecule which contains carbon atoms. ✓✓
'n Organiese molekule is 'n molekule wat koolstofatome bevat. ✓✓ (2)

3.1.2 C_nH_{2n} ✓ (1)

3.1.3 Alcohols / *Alkohole* ✓ (1)

3.1.4 Hydroxyl group / *Hidroksielgroep* ✓ (1)

3.1.5



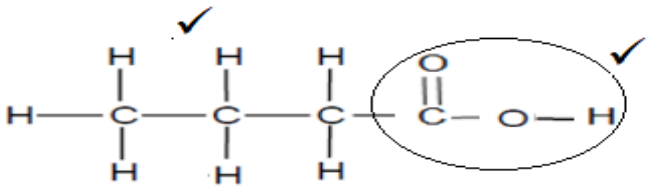
(2)

3.2 3.2.1 Esters: Dipole-dipole intermolecular forces ✓
Esters: Dipool-dipool intermolekulêre kragte ✓ (1)

Alcohols: Hydrogen bond ✓
Alkohole: Waterstofbinding ✓ (1)

3.2.2 Methanoic acid / *Metanoësuur* ✓ (1)

3.2.3



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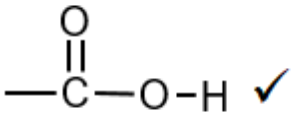
3.2.4



(1)

3.3 3.3.1 Same molecular formula, C_5H_{12} ✓
Dieselfde molekulêre formule, C_5H_{12} ✓ (1)

3.3.2 Different chain length / *Kettinglengte verskil* ✓ (1)

3.3.3 Alkanes / *Alkane* ✓ (1)

3.4 3.4.1 Pentane / *Pentaan* ✓ (1)

3.4.2 2-methyl ✓ butane ✓ / *2-metiel* ✓ *butaan* ✓ (2)

3.4.3 Pentane / *Pentaan* ✓ (1)

3.4.4 B ✓ (1)

3.4.5 B is branched; ✓ the more branches in the organic compound, the smaller the surface area.✓
B is vertak; ✓ *hoe meer takke die organiese verbinding het, hoe kleiner is die oppervlakarea.* ✓ (2)

3.5 3.5.1 Plastics are synthetic materials derived from organic compounds. ✓✓
Plastiek is sintetiese materiale afkomstig van organiese verbindings. ✓✓ (2)

3.5.2

	USE / *GEBRUIKE*
B	Food-packaging plastics / *Voedselverpakkings-plastiek* ✓
C	Squeezable bottles / *Drukbare waterbottels* ✓
E	Flexible water pipes / *Buigbare waterpype* ✓

(Any 2 x 1) (2)
[27]

QUESTION/*VRAAG* 4

4.1 Vapour pressure is the pressure exerted by a vapour at equilibrium with its liquid in a closed system. ✓✓
Dampdruk is die druk wat uitgeoefen word deur 'n damp wat in ewewig is met sy vloeistof in 'n geslote sisteem. ✓✓ (2)

4.2 4.2.1 Dipole-dipole intermolecular forces ✓
Dipool-dipool intermolekulêre kragte ✓ (1)

4.2.2 Dipole-dipole intermolecular forces ✓
Dipool-dipool intermolekulêre kragte ✓ (1)

4.3 Viscosity of chlorohexane is **HIGHER.** ✓
Chlorohexane has stronger dipole-dipole intermolecular forces.
Pentane has weaker dispersion / London forces. ✓
*Viskositeit van chloro-heksaan is **HOËR**.* ✓
Chloroheksaan het sterker dipool-dipool intermolekulêre kragte.
Pentaan het swakker dispersie / Londonkragte. ✓ (2)

4.4 Pentane/ *Pentaan* ✓
It has weak London forces. ✓ Less energy will be required to overcome intermolecular forces. ✓
Dit het swak Londonkragte. ✓ *Minder energie benodig om intermolekulêre kragte te oorkom.* ✓ (3)

4.5 London forces / *Londonkragte* ✓✓ (2)
[11]

QUESTION/*VRAAG* 5

5.1 Hydrocarbons are organic compounds that consist only of hydrogen and carbon atoms. ✓
Koolwaterstowwe is organiese verbindings wat slegs uit waterstof- en koolstofatome bestaan. ✓ (1)

5.2 5.2.1 $CH_4 + 2O_2$ ✓ $\longrightarrow$ $CO_2 + 2H_2O$ ✓ ✓ bal (3)

5.2.2 Excess oxygen / *Oormaat energie* ✓ (1)
[5]

QUESTION/*VRAAG* 6

6.1 6.1.1 Hydrolysis / *Hidrolise* ✓ (1)

6.1.2 Hydration / *Hidrasie* ✓ (1)

6.1.3 Esterification / *Esterifikasie* ✓ (1)

6.2 6.2.1 Hexan-2-ol or 2-hexanol
Heksan-2-ol of 2-heksanol ✓ (1)

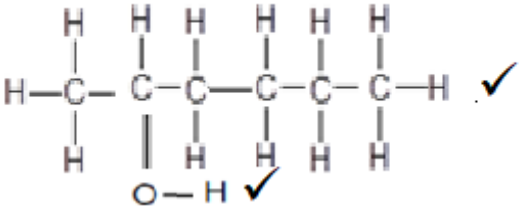
6.2.2 1-bromohexane / *1-bromoheksaan* ✓ (1)

6.2.3 Water ✓ (1)

6.3 6.3.1 Pt/Pd/Ni as a catalyst ✓
Pt/Pd/Ni as 'n katalisator ✓ (1)

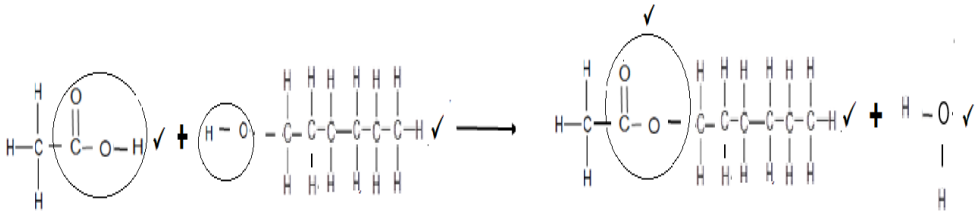
6.3.2 No water added, unreactive solvent, $CHCl_2$, CCl_4 ✓
Geen water bygevoeg nie, onreaktiewe oplosmiddel, $CHCl_2$, CCl_4 ✓ (1)

6.4



(2)

6.5 6.5.1



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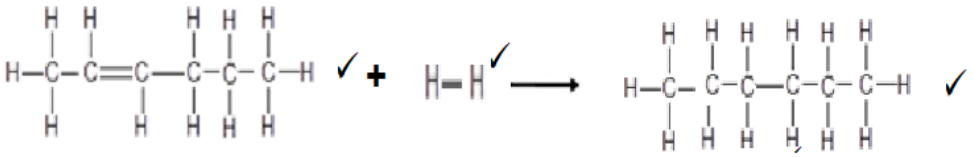
6.5.2 Ethyl hexanoate ✓
Etielheksanoaat ✓ (1)

6.5.3



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[18]

TOTAL/*TOTAAL*: 75