Province of the
EASTERN CAPE
EDUCATION

Iphondo leMpuma Kapa: Isebe leMfundo
Provinsie van die Oos Kaap: Department van Onderwys
Porafensie Ya Kapa Botjahabela: Lefapha la Thuto

NATIONAL SENIOR CERTIFICATE/ *NASIONALE SENIORSERTIFIKAAT*

GRADE/*GRAAD 12*

SEPTEMBER 2026

TECHNICAL SCIENCES P2/ *TEGNIESE WETENSKAPPE V2* MARKING GUIDELINE/ *NASIENRIGLYN*

MARKS/PUNTE: 75

This marking guideline consists of 11 pages./
Hierdie nasienriglyn bestaan uit 11 bladsye.

Thank you for choosing www.ecexams.co.za to download examination documents.

QUESTION/*VRAAG 1*

1.1 C ✓✓ (2)

1.2 B ✓✓ (2)

1.3 A ✓✓ (2)

1.4 C ✓✓ (2)

1.5 B ✓✓ (2)
[10]

Thank you for choosing www.ecexams.co.za to download examination documents.

QUESTION/*VRAAG 2*

2.1 Molecules containing carbon atoms. ✓✓/
Molekules wat uit koolstof atome bestaan. (2)

2.2 2.2.1 A ✓ (1)

2.2.2 D ✓ (1)

2.2.3 B ✓ (1)

2.3 C_nH_{2n-2} ✓ (1)

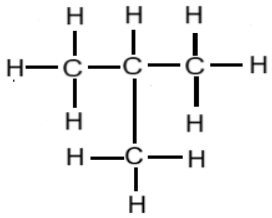
2.4 2.4.1 ethyl ✓propanoate ✓ / *etiel ✓ propanoaat* ✓ (2)

2.4.2 2-chloro ✓-3-methylpentane ✓ / *2-chloro* ✓ *-3- metielpentaan* ✓

Marking criteria/*Nasienkriteria*
- Penalise if hyphen is not used / *Penaliseer as koppelteken nie gebruik is nie.*

(2)

2.5 2.5.1



✓✓

Marking criteria/*Nasienkriteria*
- Parent chain has 3 carbons and a methyl substiuent✓/*Ouerketting het 3 koolstowwe en 'n metielsubstituent*
- Whole structure correct ✓/*Hele struktuur is korrek*

NOTE: If a bond or hydrogen is missing $^1/_2$
LET WEL: *As 'n binding of waterstof ontbreek* $^1/_2$

(2)

2.5.2 2-methyl ✓ propane ✓ / *2-metiel* ✓*propaan* ✓

Marking criteria/*Nasienkriteria*
- Penalise if hyphen is not used/ *Penaliseer as koppeltekken nie gebruik is nie.*

(2)
[14]

Copyright reserved/*Kopiereg voorbehou*

Thank you for choosing www.ecexams.co.za to download examination documents.

QUESTION/*VRAAG 3*

3.1 The pressure exerted by a vapour at equilibrium with its liquid in a closed system ✓✓
Die druk wat deur 'n damp in ewewig met sy vloeistof in 'n geslote sisteem uitgeoefen word. (2)

3.2 3.2.1 X ✓/ propanone
APPLY NEGATIVE MARKING
The higher the boiling point the lower the vapour pressure. ✓
OR
It has the lowest vapour pressure.
OR
It has the strongest intermolecular forces.

X / propanoon
TOEPASSING VAN NEGATIEWE NASIEN
Hoe hoër die kookpunt, hoe laer die dampdruk.
OF
Dit het die laagste dampdruk.
OF
Dit het die sterkste intermolekulêre kragte. (2)

3.2.2 Z ✓/ butane / *butaan* (1)

3.3 Ketones ✓/ *Ketoon* (1)

3.4
- Compound **X**/ Propanone contain (London forces and) dipole-dipole forces. ✓
- Compound **Z**/ Butane contain London forces/ induced dipole forces/ dispersion forces ✓
- Dipole- dipole forces /intermolecular forces in compound **X**/ Propanone are stronger than London forces/intermolecular forces/ induced dipole forces/ dispersion forces in compound **Z** /Butane. ✓
- More energy needed to overcome the intermolecular forces/bonds in compound **X**/Propanone than in compound **Z**/Butane, thus compound **X** / Propanone have a lower vapour pressure ✓ /

- *Verbinding **X**/Propanoon bevat (Londen-kragte en) dipool-dipool kragte.*
- *Verbinding **Z**/Butaan bevat Londen-kragte/geïnduseerde dipool kragte/dispersiekragte*
- *Dipool-dipool kragte/intermolekulêrekragte in verbinding **X**/ Propanoon is sterker as Londen-kragte/intermolekulêre kragte/geïnduseerde dipool kragte/dispersiekragte in verbinding **Z**/Butaan.*
- *Meer energie word benodig om die intermolekulêre kragte/bindings in verbinding **X**/Propanoon te oorkom as in verbinding **Z**/Butaan, dus het verbinding **X**/Propanoon 'n laer dampdruk*

OR/*OF*

Thank you for choosing www.ecexams.co.za to download examination documents.

- Compound **Z**/Butane contain London forces/ induced dipole forces/ dispersion forces.
- Compound **X**/Propanone contain (London forces and) dipole-dipole forces.
- London forces/intermolecular forces/ induced dipole forces/ dispersion forces in compound **Z**/Butane are weaker than dipole-dipole forces/intermolecular forces in compound **X**/Propanone.
- Less energy needed to overcome the intermolecular forces/bonds in compound **Z** /Butane than in compound **X**/Propanone, thus compound **Z**/Butane have higher vapour pressure /

- *Verbinding **Z**/Butaan bevat Londen-kragte/geïnduseerde dipoolkragte/ dispersiekragte.*
- *Verbinding **X**/Propanoon bevat (Londen-kragte en) dipool-dipoolkragte.*
- *Londen-kragte/intermolekulêre kragte/geïnduseerde dipoolkragte/dispersiekragte in verbinding **Z**/Butaan is swakker as dipool-dipoolkragte/intermolekulêre kragte in verbinding **X**/Propanoon.*
- *Minder energie word benodig om die intermolekulêre kragte/bindings in verbinding **Z**/Butaan te oorkom as in verbinding **X**/Propanoon, dus het verbinding **Z**/Butaan 'n hoër dampdruk.* (4)

[10]

Copyright reserved/*Kopiereg voorbehou*

Thank you for choosing www.ecexams.co.za to download examination documents.

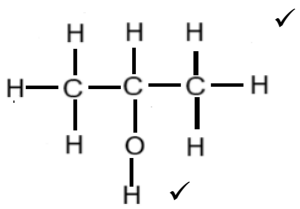
QUESTION/*VRAAG 4*

4.1 4.1.1 Addition/Hydrogenation ✓/ *Addisie/Hidrogenasie* (1)

4.1.2 Substitution Hydrolysis (of haloalkanes) ✓ /
Substitusie/Hidrolise (van haloakane) (1)

4.2. 4.2.1 H_2O ✓ (1)

4.2.2



✓ ✓

Marking criteria/
Nasienkriteria

- Correct functional group ✓/
  Korrekte funksionele groep
- Whole structure correct ✓/
  Hele struktuur korrek

NOTE: If a bond or hydrogen is missing ½
LET WEL: *As 'n binding of waterstof ontbreek ½*

(2)

4.2.3 Hydroxyl (group) ✓ / *Hidroksiel (groep)* (1)

✓

4.3 2-bromo ✓ propane ✓/ *2-bromopropaan* ✓

Marking criteria/ *Nasienkriteria*
- Penalise if hyphen is not used /
  Penaliseer as koppelteken nie gebruik is nie

(2)

4.4 No water must be present. **OR** Anhydrous solution ✓ /
Geen water mag teenwoordig wees nie. ***OF*** *Watervrye oplossing* (1)

4.5 $C_3H_8 + 5O_2$ ✓→ $3CO_2 + 4H_2O$ ✓ (Balancing / B*alansering*) ✓

Marking criteria/*Nasienkriteria*
- 1 mark for reactants/ *1 punt vir reaktante*
- 1 mark for products / *1 punt vir produkte*
- 1 mark for balancing / *1 punt vir balansering*

(3)
[12]

Thank you for choosing www.ecexams.co.za to download examination documents.

QUESTION/*VRAAG 5*

5.1 A pure semiconductor ✓✓ / *'n Suiwer halfgeleier* (2)

5.2 Ge(Germanium) / Sn(Grey tin/*Grys tin*) / $C_{(s)}$(Diamond/*Diamant)* ✓ (1)

5.3 FORWARD BIASED ✓ / *MEEVOORSPANNING*
APPLY NEGATIVE MARKING / TOEPASSING VAN NEGATIEWE NASIEN
The positive terminal of the battery is connected to the p-type material, ✓ and the negative terminal is connected to the n-type material ✓/
Die positiewe terminaal van die battery is aan die p-tipe materiaal gekoppel, en die negatiewe terminaal is aan die n-tipe materiaal gekoppel. (2)
[5]

Thank you for choosing www.ecexams.co.za to download examination documents.

QUESTION/*VRAAG 6*

6.1 The decomposition of a substance when an electric current is passed through it ✓✓

OR

The chemical process in which electrical energy is converted to chemical energy.

OR

The use of electrical energy to produce a chemical change./

Die ontbinding van 'n stof wanneer 'n elektriese stroom daardeur gelei word.

OF

Die chemiese proses waarin elektriese energie in chemiese energie omgeskakel word.

OF

Die gebruik van elektriese energie om 'n chemiese verandering te veroorsaak. (2)

6.2 The reaction is non-spontaneous ✓, therefore electrical energy is required to drive the reaction. ✓/
Die reaksie is nie-spontaan, daarom is elektriese energie nodig om die reaksie aan te dryf (2)

6.3 Chloride ions ✓ **OR** Cl^-
APPLY NEGATIVE MARKING
It loses electrons ✓at the anode.

OR

It undergoes oxidation ✓ at the anode.

OR

It is oxidised ✓ at the anode./

*Chloriedione **OF** Cl^-*
TOEPAS VAN NEGATIEWE NASIEN
Dit verloor elektrone by die anode.

OF

Dit ondergaan oksidasie by die anode.

OF

Dit word geoksideer by die anode. (2)

6.4 A red-brownish layer is formed ✓/Copper(Cu) is formed.

OR

The mass of the electrode increases./

'n Rooibruinerige laag word gevorm /Koper(Cu) word gevorm.

OF

Die massa van die elektrode neem toe. (1)

Copyright reserved/*Kopiereg voorbehou*

Thank you for choosing www.ecexams.co.za to download examination documents.

6.5 $Cu^{2+}_{(aq)} + 2e^- \rightarrow Cu_{(s)}$ ✓✓

Marking criteria/*Nasienkriteria*

$Cu^{2+}_{(aq)} + 2e^- \rightarrow Cu_{(s)}$ $^2/_2$ $Cu^{2+}_{(aq)} + 2e^- \rightleftharpoons Cu_{(s)}$ $^1/_2$

$Cu_{(s)} \rightarrow Cu^{2+}_{(aq)} + 2e^-$ $^0/_2$ $Cu_{(s)} \rightleftharpoons Cu^{2+}_{(aq)} + 2e^-$ $^0/_2$

NOTE:

- Do not penalise if the phases are omitted.
- Ignore if charge on electron is omitted./

LET WEL:

- *Moenie penaliseer as die fases weggelaat word nie.*
- *Ignoreer as lading op elektron weggelaat word*

(2)

6.6 Electroplating ✓
OR
Extraction of metals
OR
Purification of metals /

Elektroplatering
OF
Ekstraksie van metale
OF
Suiwering van metale (1)

[10]

Copyright reserved/*Kopiereg voorbehou*

Thank you for choosing www.ecexams.co.za to download examination documents.

QUESTION/ *VRAAG 7*

7.1 An electrochemical cell that converts chemical energy to electrical energy. ✓✓ /
'n Elektrochemiese sel wat chemiese energie na elektriese energie omskakel. (2)

7.2 Salt bridge ✓/ *Soutbrug*
(1)

7.3 It completes the circuit. ✓
OR
It maintains electrical neutrality.
OR
It separates the two compartments, so that they do not mix./

Dit voltooi die stroombaan.
OF
Dit handhaaf elektriese neutraliteit.
OF
Dit skei die twee kompartemente, sodat hulle nie meng nie. (1)

7.4 Zn to/*na* Ag ✓ (1)

7.5.1 $Zn_{(s)} \rightarrow Zn^{2+}_{(aq)} + 2e^-$ ✓✓

Marking criteria/*Nasienkriteria*
$Zn_{(s)} \rightarrow Zn^{2+}_{(aq)} + 2e^-$ $^2/_2$ $Zn_{(s)} \rightleftharpoons Zn^{2+}_{(aq)} + 2e^-$ $^1/_2$
$Zn^{2+}_{(aq)} + 2e^- \rightarrow Zn_{(s)}$ $^0/_2$ $Zn^{2+}_{(aq)} + 2e \rightleftharpoons Zn_{(s)}$ $^0/_2$

NOTE:
- Do not penalise if the phases are omitted
- Ignore if charge on electron is omitted.

LET WEL:
- *Moenie penaliseer as die fases weggelaat word nie.*
- *Ignoreer as lading op elektron weggelaat word.*

(2)

7.5.2 $Zn_{(s)} \mid Zn^{2+}_{(aq)}$ ✓ ‖ ✓ $Ag^+_{(aq)} \mid Ag_{(s)}$ ✓

Marking criteria/*Nasienkriteria*
- Do not penalise if phases/concentrations are omitted. /
- *Moenie penaliseer as fases/konsentrasies weggelaat word nie*

(3)

Copyright reserved/*Kopiereg voorbehou*

Thank you for choosing www.ecexams.co.za to download examination documents.

7.6 **OPTION 1/*OPSIE 1***

$E^{\theta}_{cell/sel} = E^{\theta}_{cathode/katode} - E^{\theta}_{anode/anode}$ ✓
$2,46 = 0,80 - E^{\theta}_{(X)}$ ✓
$E^{\theta}_{(X)} = -1,66\ V$ ✓
X is Aluminium (Aℓ) ✓

OPTION 2/*OPSIE 2*

$X \rightarrow X^{3+} + 3e^-$
$Ag^+ + e^- \rightarrow Ag$ ✓
$E^{\theta}_{(X)} = -1,66\ V$ ✓
$E^{\theta}_{cathode/katode} = 0,80\ V$
$E^{\theta}_{cell/sel} = 2,46\ V$ ✓

X is Aluminium (Aℓ) ✓ (4)
[14]

TOTAL/*TOTAAL:* 75

Copyright reserved/*Kopiereg voorbehou*

Thank you for choosing www.ecexams.co.za to download examination documents.