



Province of the
EASTERN CAPE
EDUCATION

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

**NATIONAL
SENIOR CERTIFICATE/
NASIONALE
SENIOR SERTIFIKAAT**

GRADE/GRAAD 11

NOVEMBER 2025

**TECHNICAL SCIENCES P2 (CHEMISTRY)/
TEGNIESE WETENSKAPPE V2 (CHEMIE)
MARKING GUIDELINE/NASIENRIGLYN**

MARKS/PUNTE: 75

This marking guideline consists of 7 pages./
Hierdie nasienriglyn bestaan uit 7 bladsye.

QUESTION/VRAAG 1

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

QUESTION/VRAAG 2

- 2.1 2.1.1 A system which can exchange energy and matter with the surroundings. ✓✓
’n Sisteem wat deeltjies en energie met die omgewing kan uitruil. (2)
- 2.1.2 The sum of the kinetic and potential energies of all the molecules of the system. ✓✓
Die som van die kinetiese en potensiële energie van al die molekules van die sisteem. (2)
- 2.2 Temperature/*Temperatuur* ✓
Pressure/*Druk* ✓
Volume ✓ (3)
- 2.3 2.3.1 If heat energy is given to a system, it is used in increasing the internal energy of the system ✓ and doing work against external pressure. ✓
Indien warmte-energie aan ’n sisteem verskaf word, word dit gebruik om die interne energie van die sisteem te verhoog en om arbeid teen eksterne druk te verrig. (2)
- 2.3.2 $\Delta Q = \Delta U + \Delta W$ ✓
 $550\ 000 = 145\ 000 + \Delta W$ ✓
 $\Delta W = 405\ 000\ \text{J}$ **OR/OF** 405 kJ ✓ (3)
- 2.3.3 By the system ✓
Deur die sisteem
APPLY NEGATIVE MARKING/PAS NEGATIEWE MERK TOE.
The value of the work is positive ✓
Die waarde van die arbeid is positief (2)
- [14]**

QUESTION /VRAAG 3

3.1 3.1.1 The amount heat required to increase the temperature of the whole substance by 1°C or 1K. ✓✓
Die hoeveelheid warmte benodig om die temperatuur van die hele stof met 1°C of 1K te laat styg. (2)

3.1.2 $C = cm$ ✓
 $= (400)(2)$ ✓
 $= 800 \text{ J.K}^{-1}$ ✓ (3)

3.1.3 **POSITIVE MARK FROM QUESTION 3.1.2**
POSITIEWE NASIEN VANAF VRAAG 3.1.2

OPTION/OPSIE 1

$$Q = cm \Delta T \checkmark$$

$$= (400)(2)(40) \checkmark$$

$$= 32\,000 \text{ J} \checkmark$$

OPTION/OPSIE 2

$$C = \frac{Q}{\Delta T}$$

$$800 = \frac{Q}{40}$$

$$\therefore Q = 32\,000 \text{ J} \quad (3)$$

3.2 3.2.1 Thermometer/*Termometer* ✓ (1)

3.2.2 The amount of heat lost equals the amount of heat gained, when no heat is lost. ✓✓
Die hoeveelheid warmte wat afgegee word is gelyk aan die hoeveelheid warmte wat opgeneem word indien geen warmte verlore gaan nie. (2)

3.2.3 $Q_{\text{gained/opgeneem}} = Q_{\text{lost/verlore}} \checkmark$
 $(cm\Delta T)_{\text{gained/opgeneem}} = (cm\Delta T)_{\text{lost/verlore}} \}$ ANY ONE/ENIGE EEN
 $4200 \checkmark \times 0,4 \checkmark \times 2 \checkmark = c \times 0,358 \checkmark \times 72 \checkmark$
 $\therefore c = 130,35 \text{ J.kg}^{-1}.\text{K}^{-1} \sim 130 \text{ J.kg}^{-1}.\text{K}^{-1}$ (6)
[17]

QUESTION/VRAAG 4

- 4.1 Oxidation is the loss of electrons. ✓✓
 Reduction is the gain of electrons. ✓✓
Oksidasie is die verlies van elektrone.
Reduksie is die wins van elektrone. (4)

- 4.2 4.2.1 $\underline{\text{Mg}}\text{Cl}_2$
 $\text{Mg} + 2(-1) = 0$
 $\therefore \text{Mg} = +2$ ✓✓

NOTE/LET WEL:

- Full marks awarded ($\frac{2}{2}$) in Question 4.2 for answers only.

Volpunte word toegeken ($\frac{2}{2}$) in Vraag 4.2 vir slegs die antwoorde. (2)

- 4.2.2 $\underline{\text{N}}\text{O}_3^-$
 $\text{N} + 3(-2) = -1$
 $\therefore \text{N} = +5$ ✓✓ (2)

- 4.2.3 $\text{Na}_2\underline{\text{C}}\text{O}_3$
 $2(+1) + \text{C} + 3(-2) = 0$
 $\therefore \text{C} = +4$ ✓✓ (2)

- 4.3 4.3.1 It involves the transfer of electrons (between substances). ✓✓
Dit behels die oordrag van elektrone (tussen stowwe). (2)

- 4.3.2 Iron(III)ions/Yster(III)ione/ Fe^{3+} ✓✓ (2)

- 4.3.3 Al/Aluminium ✓
APPLY NEGATIVE MARKING/PAS NEGATIEWE MERK TOE
 Oxidation number increases (from 0 to +3) ✓✓
Oksidasiegetal neem toe (vanaf 0 tot +3) (3)

[17]

QUESTION/VRAAG 5

- 5.1 The decomposition of a substance when an electric current passes through it ✓✓
Die opbreek van 'n stof wanneer 'n elektriese stroom daardeur beweeg.

OR/OF

The chemical process in which electrical energy is converted to chemical energy.
Die chemiese proses waarin elektriese energie in chemiese energie omskakel word.

OR/OF

The use of electrical energy to produce a chemical change.
Die gebruik van elektriese energie om 'n chemiese verandering te bewerkstellig.

(2)

- 5.2 Copper(II)chloride/*Koper(II)chloried* ✓ (1)
- 5.3 Cell/ Battery/Power source ✓
Sel/ Battery/Kragbron (1)
- 5.4 A substance that undergoes reduction. ✓✓
'n Stof wat self reduksie ondergaan.

OR/OF

A substance that gains electrons.
'n Stof wat elektrone bygekry het.

OR/OF

A substance that is reduced.
'n Stof wat self gereduseer word

(2)

- 5.5 Copper(II)ions/*Koper(II)ione*/ Cu^{2+} ✓ (1)

5.6 Electrode/Elektrode Y ✓

APPLY NEGATIVE MARKING/PAS NEGATIEWE MERK TOE

It is the positive electrode. ✓✓

Dit is die positiewe elektrode.

OR/OF

In an electrolytic cell the anode is positive.

In 'n elektrolitiese sel is die anode positief.

OR/OF

Oxidation will take place at the anode/positive electrode/electrode Y.

Oksidasie sal by die anode/positiewe elektrode/elektrode Y plaasvind.

OR/OF

It is positively charged.

Dit is positief gelaai.

(3)

5.7 Cations/Katione ✓

(1)

5.8 Gas bubbles formed/bubbles formed/gas formed/chlorine gas formed ✓✓

Gasborrels het gevorm/ borrels het gevorm/gas het gevorm/chloorgas het gevorm

(2)

5.9 5.9.1 $\text{Cu}^{2+}_{(\text{aq})} + 2\text{e}^{-} \rightarrow \text{Cu}_{(\text{s})}$ ✓✓

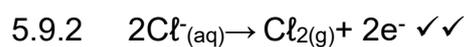
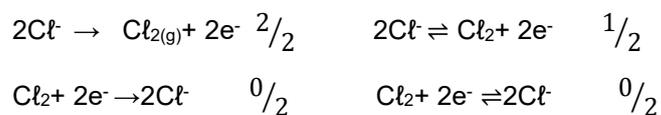
MARKING CRITERIA/NASIENKRITERIA:



NOTE/LET WEL:

- Do not penalise if the phases are omitted./
Moenie penaliseer indien die fases uitgelaat word nie.

(2)

**MARKING CRITERIA/NASIENKRITERIA:****NOTE/LET WEL:**

- Do not penalise if the phases are omitted./
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(2)
[17]**TOTAL/TOTAAL: 75**