LIMPOPO

PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF
EDUCATION

NATIONAL SENIOR CERTIFICATE

GRADE 10

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PHYSICAL SCIENCES:CHEMISTRY (P2)/*FISIESE WETENSKAPPE: CHEMIE (V2)*

JUNE/*JUNIE* 2026

MARKING GUIDELINES/*NASIENRIGLYNE*

MARKS/*PUNTE*: 100

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

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Turn over please/*Blaai om asb*

QUESTION 1/*VRAAG 1*

1.1 D ✓✓ (2)

1.2 D ✓✓ (2)

1.3 B ✓✓ (2)

1.4 D ✓✓ (2)

1.5 D ✓✓ (2)

1.6 A ✓✓ (2)

1.7 D ✓✓ (2)

1.8 B ✓✓ (2)

[16]

QUESTION 2/*VRAAG 2*

2.1 The ability of a material to be hammered or pressed into thin sheets without breaking or cracking. ✓✓ **(2 or zero)**/ *Potensiaal om in vorms gehamer of gedruk te word sonder om te breek of te kraak* (**2 of nul**) (2)

2.2

- **Step 1:** Add water to the mixture and stir to dissolve the salt. ✓/ ***Stap 1****: Voeg water by die mengsel en roer om die sout op te los*
- **Step 2:** Filter the mixture; sand remains on the filter paper (residue). ✓/ ***Stap 2****: Filtreer die mengsel; sand bly op die filterpapier (residu).*
  OR/*OF*
  Filtration (only: accept) ✓/ *Filtrering (slegs: aanvaar)*
- **Step 3:** Evaporate the water from the filtrate (salt water) to recover the salt. ✓/ **Stap 3**: *Verdamp die water uit die filtraat (soutwater) om die sout te herwin*
  OR/*OF*
  Evaporation (only: accept) ✓/ *Evaporation (only: accept)*

NOTE/*NOTA:*	-1 only if the steps are not in order/*-1 slegs indien die stappe nie in volgorde is nie*	✓✓2/3 total/*totaal*

(3)

2.3

2.3.1 Sample A✓/ *Voorbeeld A* (1)

2.3.2 Pure substances have a **fixed/sharp** melting point ✓✓/ *Suiwer stowwe het 'n vaste/skerp smeltpunt*

Or/*Of*
Pure substances consist of same type of atoms/ *Suiwer stowwe bestaan uit dieselfde tipe atome* (2)

2.3.3 Mixtures contain <u>different substances with different melting</u> <u>points</u>, causing them to melt gradually as temperature increases. ✓✓ / *Mengsels bevat verskillende stowwe met verskillende smeltpunte, wat veroorsaak dat hulle geleidelik smelt soos temperatuur styg.* (2)

2.4

2.4.1 Copper ✓/*Koper* (1)

2.4.2
- It is a good electrical conductor. ✓/ *Dit is 'n goeie elektriese geleier*
- Is ductile (can be drawn into wires). ✓/ *Is rekbaar (kan in drade getrek word).* (2)

[13]

QUESTION 3/*VRAAG 3*

3.1 Cooling curve of an unknown pure substance ✓/ *Verkoelingskurwe van 'n onbekende suiwer stof*

Or/*Of*

Accept: temperature vs time graph of unknown pure substance ✓/
***Aanvaar**: temperatuur teenoor tydgrafiek van onbekende suiwer stof* (1)

3.2 The temperature at which a solid, given sufficient heat, becomes a liquid. ✓✓ (2 or zero) / *Die temperatuur waarby 'n vaste stof, met voldoende hitte, 'n vloeistof word. (2 of nul)* (2)

3.3 Liquid ✓/*Vloeistof* (1)

3.4

3.4.1 E-F ✓ (1)

3.4.2 A-B ✓ (1)

3.4.3 C-D ✓ **Or/*Of*** E-F ✓ (1)

3.4.4 E-F ✓ (1)

3.5 **<u>According to the Kinetic Molecular Theory</u>**

- As temperature decreases in winter ✓
- The average kinetic energy of air particles decreases. ✓

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- Particles move slower and collide with the tyre walls less frequently and with less force. ✓
- This leads to a decrease in internal pressure, making the tyre appear "flat." ✓

Vogens die Kinetiese Molekulêre Teorie:

- *Soos die temperatuur in die winter daal,*
- *neem die gemiddelde kinetiese energie van die lugdeeltjies af.*
- *Die deeltjies beweeg stadiger en bots minder gereeld en met minder krag teen die bandwande.*
- *Dit lei tot 'n afname in die interne druk, wat die band "pap" laat lyk.* (4)

3.6

3.6.1 Diffusion ✓/*Diffusie* (1)

3.6.2 High-energy perfume gas particles move from an area of **high concentration** (the corner) to **low concentration** (the rest of the room) until evenly spread. ✓✓/ *Hoë-energie parfuumgasdeeltjies beweeg van 'n area met **hoë konsentrasie** (die hoek) na **'n lae konsentrasie** (die res van die kamer) totdat dit eweredig versprei is.* (2)

[15]

QUESTION 4/*VRAAG 4*

4.1 The number of protons in an atom of an element. ✓✓ **(2 or zero)**/ *Die aantal protone in 'n atoom van 'n element. (2 of nul)*
Or/*Of*
The number of protons in the nucleus of an atom. ✓✓ **(2 or zero)**/ *Die aantal protone in die kern van 'n atoom. (2 of nul)* (2)

4.2

4.2.1 6 ✓ (1)

4.2.2 Electrons ✓/ *Elektrone* (1)

4.2.3 6 ✓ (1)

4.2.4 Non-metal ✓/ *Nie-metaal* (1)

4.2.5 $^{14}_{6}C$

Criteria/*Kriteria*	
A = 14 Z = 6	✓

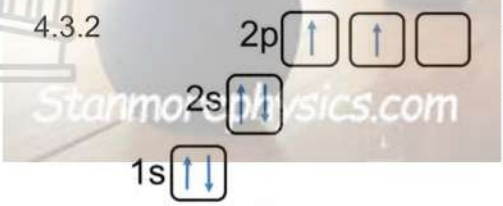
(2)

C (for carbon/*vir koolstof*)	✓
total/*totaal*	✓✓

4.3

4.3.1 $\underline{1s^2}$ ✓ $\underline{2s^2\ 2p^2}$ ✓ (2)

4.3.2



✓
✓
✓ (3)

4.4

4.4.1 Atoms of the same element having the same number of protons, but different numbers of neutrons. ✓✓ **(2 or zero)**/ *Atome van dieselfde element met dieselfde aantal protone, maar verskillende getalle neutrone. (2 of nul)* (2)

4.4.2 $RAM = \left(\frac{32}{100} \times 29\right)$ ✓ $+ \left(\frac{20}{100} \times 30\right) + \left(\frac{48}{100} \times 31\right)$ ✓

$RAM = 30.16\ amu$ ✓ (3)

4.4.3 Phosphorus ✓✓ (or P)/ *Fosfor (of P)* (2)

[20]

QUESTION 5/*VRAAG 5*

5.1 The distance from the nucleus to the outermost stable electron orbital. ✓✓ **(2 or zero)**/ *Die afstand van die kern na die buitenste stabiele elektronorbitaal. (**2 of nul**)* (2)

5.2 ACCEPT/*AANVAAR*: 98 pm – 100 pm ✓

No mark if SI-unit "pm" is omitted/*Geen punt indien SI-eenheid "pm" weggelaat word nie* (1)

5.3

- Both are in the same period on Periodic Table, and they have the same number of energy levels which is 2. ✓/ *Beide is in dieselfde periode op die Periodieke Tabel, en hulle het dieselfde aantal energievlakke, naamlik 2.*
- Fluorine has more protons (higher nuclear charge) than Lithium at the same energy level. ✓/ *Fluoor het meer protone (hoër kernlading) as litium teen dieselfde energievlak.*

- This exerts a stronger pull on the electrons, making the radius smaller. ✓/ *Dit oefen 'n sterker aantrekkingskrag op die elektrone uit, wat die radius kleiner maak*. (3)

5.4
- Both are in the same Group on Periodic Table. ✓/ *Beide is in dieselfde groep op die periodieke tabel.*

- But Potassium has an extra electron shell (energy level) compared to Sodium. ✓/ *Maar kalium het 'n ekstra elektronskil (energievlak) in vergelyking met natrium.*

- Which increases the distance from the nucleus to the outer electrons. ✓/ *Wat die afstand van die kern na die buitenste elektrone vergroot.* (3)

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QUESTION 6/*VRAAG 6*

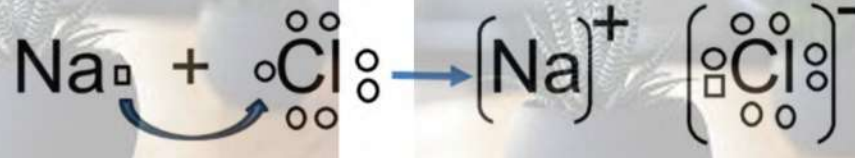
6.1

6.1.1 Sodium Chloride. ✓✓/ *Natriumchloried* (2)

6.1.2 Ionic bond ✓/ *Ioniese binding* (1)

6.1.3 It occurs between a metal (Na) and a non-metal (Cl) ✓ involving the transfer of electrons. ✓/ *Dit vind plaas tussen 'n metaal (Na) en 'n nie-metaal (Cl) wat die oordrag van elektrone behels.* (2)

6.1.4



Reactants/ *Reaktante*	Products/ *Produkte*	Ion atoms/ *Ioonatome*
✓	✓	✓
	total/ *totaal*	✓ ✓ ✓

(3)

6.2

6.2.1 Ionic bonding ✓/ *Ioniese binding* (1)

6.2.2
- It consists of a lattice of positive metal ions surrounded by a sea of delocalized electrons ✓/ *Dit bestaan uit 'n rooster van positiewe metaalione omring deur 'n see van gedelokaliseerde elektrone.*
- Which are free to move and carry charge. ✓/ *Wat vry is om te beweeg en lading te dra* (2)

[11]

QUESTION 7/*VRAAG 7*

7.1 Chemical change ✓/ *Chemiese verandering*

- New chemical substances are formed ✓/ *Nuwe chemiese stowwe word gevorm*
- Mass and atoms are conserved, but the number of molecules is not ✓/ *Massa en atome bly behoue, maar die aantal molekules nie* (3)

7.2 Total mass of reactants = Total mass of products./ *Totale massa van reaktante = Totale massa van produkte*

$Mr(Na_2CO_3) + Mr(HNO_3) = Mr(NaNO_3) + Mr(CO_2) + Mr(X)$

108 ✓ + 126 ✓= 170 + 44 ✓+ Mr(X)

$Mr(X) = 18\ g.mol^{-1}$ ✓ (5)

7.3 H_2O (1)

7.4 (2)

$\underline{Na_2CO_3(s) + 2HNO_3(aq) \rightarrow 2NaNO_3(s) + CO_2(g) + H_2O}$ ✓

7.5 CO_2 **OR** Carbon dioxide/ ***OF*** *Koolstofdioksied* (1)

7.6

V = 2000 cm^3 = 2 dm^3 ✓

$n = V$ ✓

$n = \frac{2}{22,4}$ ✓

$n = 0,089\ mol$ ✓ (4)

[16]

TOTAL/*TOTAAL*: 100

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