



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE
NASIONALE
SENIOR SERTIFIKAAT**

GRADE/GRAAD 10

**TECHNICAL SCIENCES: CHEMISTRY (P2)
TEGNIJSE WETENSKAPPE: CHEMIE (V2)**

EXEMPLAR/MODEL 2016

MEMORANDUM

MARKS/PUNTE: 150

**This memorandum consists of 7 pages.
*Hierdie memorandum bestaan uit 7 bladsye.***

QUESTION/VRAAG 1

- 1.1 A ✓✓ (2)
- 1.2 D ✓✓ (2)
- 1.3 B ✓✓ (2)
- 1.4 B ✓✓ (2)
- 1.5 C ✓✓ (2)
- 1.6 C ✓✓ (2)
- 1.7 A ✓✓ (2)
- 1.8 B ✓✓ (2)
- 1.9 A ✓✓ (2)
- 1.10 B ✓✓ (2)
- [20]**

QUESTION/VRAAG 2

- 2.1 A substance which consists of one type of atoms or particles (that has chemical and physical properties that does not change). ✓✓
'n Stof wat bestaan uit een tipe atoom of deeltjies (dit het chemiese en fisiese eienskappe wat nie verander nie) ✓✓ (2)
- 2.2.1 Mercury ✓, gold ✓, copper ✓, lead ✓, sodium ✓
Kwik ✓, goud ✓, koper ✓, lood ✓, natrium ✓ (5)
- 2.2.2 Sulphur ✓, oxygen ✓, chlorine ✓, fluorine ✓
Swawel ✓, suurstof ✓, chloor ✓, fluoor ✓ (4)
- 2.2.3 Lead sulphide ✓, mercury sulphide ✓
Loodsulfied ✓, kwiksulfied ✓ (2)
- 2.2.4 Sodium chloride ✓✓
Natriumchloried ✓✓ (2)
- 2.2.5 Magnesium oxide ✓✓
Magnesiumoksied ✓✓ (2)
- 2.2.6 Copper chloride ✓✓
Koperchloried ✓✓ (2)
- 2.3 Halogens ✓✓
Halogene ✓✓ (2)
- [21]**

QUESTION/VRAAG 3

- 3.1 Cation is a positively charged atom or molecule.✓✓
 Anion is a negatively charged atom or molecule.✓✓
Katione is positief gelaaide atome of molekule✓✓
Anione is negatief gelaaide atome of molekule✓✓ (4)
- 3.2.1 Magnesium ion✓ charge: +2 ✓
Magnesium-ioon✓*lading: +2*✓ (2)
- 3.2.2 Sulphate ion✓ charge: -2✓
Sulfaatioon✓*lading: -2*✓ (2)
- 3.2.3 Nitrate ion ✓ charge: -1✓/*Nitrat-ioon*✓*lading: -1*✓ (2)
- 3.3.1 NaBr✓✓ (2)
- 3.3.2 MgO✓✓ (2)
- 3.3.3 HCl✓✓ (2)
- 3.4.1 Iron(III) iodide✓✓ *Yster(III)jodied*✓✓ (2)
- 3.4.2 Mercury(II) oxide ✓✓ *Kwik(II)oksied*✓✓ (2)
- [20]**

QUESTION/VRAAG 4

- 4.1 A – H₂O✓✓ (2)
- B – O₂✓✓ (2)
- C – CO₂✓✓ (2)
- 4.2 H : O✓
 Ration is 2 : 1✓ *Verhouding is 2:1*✓ (2)
- 4.3 3 atoms✓ 3 *atome*✓ (1)
- 4.4 Carbon dioxide✓✓ *Koolstofdioksied*✓✓ (2)
- [11]**

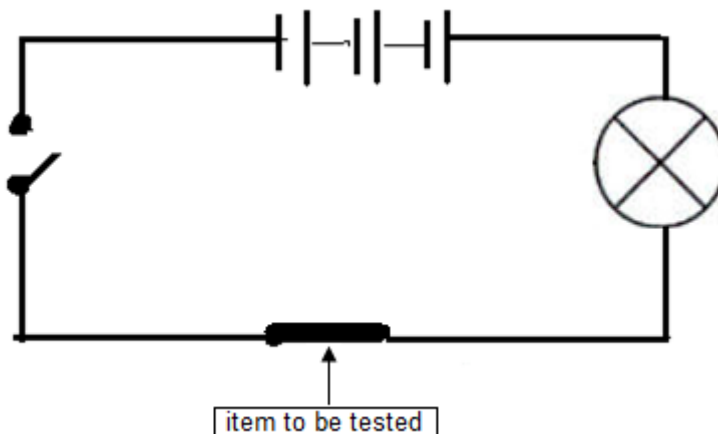
QUESTION/VRAAG 5

- 5.1.1 SO_4^{2-} ✓ (1)
- 5.1.2 Sulphite ✓ *Sulfiet* ✓ (1)
- 5.1.3 CO_3^{2-} ✓ (1)
- 5.1.4 Hydroxide ions ✓ *Hidroksiedione* ✓ (1)
- 5.2.1 $\text{Zn} + 2\text{HCl} \rightarrow \text{ZnCl}_2 + \text{H}_2$ (balancing/*balansering*) ✓ (2)
- 5.2.2 $\text{N}_2 + 3\text{H}_2 \rightarrow 2\text{NH}_3$ (balancing/*balansering*) ✓ (2)
- 5.2.3 $\text{Na}_2\text{CO}_3 + 2\text{HCl} \rightarrow 2\text{NaCl} + \text{H}_2\text{O} + \text{CO}_2$ (balancing/*balansering*) ✓ (3)
- 5.3.1 $2\text{SO}_2 + \text{O}_2 \rightarrow 2\text{SO}_3$ (balancing/*balansering*) ✓ (3)
- 5.3.2 $\text{H}_2\text{S} + 2\text{O}_2 \rightarrow \text{H}_2\text{O} + \text{SO}_3$ (balancing/*balansering*) ✓ (3)

[17]**QUESTION/VRAAG 6**

- 6.1.1 Material used (to test conductivity) ✓
Materiaal wat gebruik word (om geleiding te toets) (1)
- 6.1.2 Conductivity OR brightness of the bulb ✓
Geleiding OF gloeilampsterkte (1)
- 6.1.3 Number and type of cells ✓
Aantal en tipe selle (1)
- 6.2 On the next page/*Op die volgende bladsy*

6.2



Criteria for circuit diagram/*Kriteria vir stroombaan*

Correct symbol for a cell/battery <i>Regte simbool vir 'n sel</i>	✓
Three cells used (Accept parallel connection) <i>Drie selle gebruik (Aanvaar parallelle verbinding)</i>	✓
Correct symbol for a light bulb <i>Regte simbool vir 'n gloeilamp</i>	✓
Correct symbol for a switch <i>Regte simbool vir 'n skakelaar</i>	✓
Item to be tested must be visible/labelled <i>Item wat getoets moet, word moet sigbaar wees/ byskrifte hê</i>	✓

(5)

6.3 The light bulb will glow ✓✓
Die gloeilamp sal brand/gloei ✓✓

(2)

6.4 Ammeter ✓

(1)

[11]

QUESTION/VRAAG 7

7.1.1 A material that does not allow heat energy to pass through it ✓✓
'n Materiaal wat verhoed dat hitte-energie daardeur gaan ✓✓

(2)

7.1.2 Plastic, wool, fibre glass, etc. (ANY 2 insulators) ✓✓
Plastiek, wol, veselglas, ens. (ENIGE 2 isolators) ✓✓

(2)

7.2.1 Magnetic ✓ *Magneties*

(1)

7.2.2 Non-magnetic ✓ *Niemagneties*

(1)

7.2.3 Non-magnetic ✓ *Niemagneties*

(1)

7.3 Electric motors ✓ *Elektriese motors* ✓

Electric cranes with magnets ✓ *Elektriese hyskrane met magnete* ✓

Sound system ✓ *Klankstelsels* ✓

Floppy discs ✓ (ANY THREE uses of magnets)
(*ENIGE DRIE gebruike van magnete*)

(3)
[10]

QUESTION/VRAAG 8

8.1.1 Isotopes are atoms of the same element with the same atomic number ✓
but different mass number. ✓
*Isotope is atome van dieselfde element met dieselfde atoomgetal, maar met
verskillende massagetalle* ✓ ✓

Accept: Atoms of the same element with the same number of protons ✓
but a different number of neutrons ✓

*Aanvaar: Atome van dieselfde element met dieselfde aantal protone ✓,
maar 'n verskillende aantal neutrone* ✓

(2)

8.1.2 Group 4 or 14 ✓ *Groep 4 of 14*

Period 2 ✓ *Periode 2* ✓

(2)

8.1.3 Carbon ✓ (Symbol C ✓) *Koolstof* ✓ *Simbool C* ✓

(2)

8.1.4 X-14 Number of neutrons = mass number - atomic number
= 14 - 6 ✓
= 8 neutrons ✓

X- 12 Number of neutrons = 12 - 6 ✓
= 6 neutrons ✓

(4)

8.2.1 14 ✓

(1)

8.2.2 7 ✓

(1)

8.2.3 13 ✓

(1)

8.2 Valence electrons are electrons in the outermost energy levels ✓ ✓

Valensie-elektrone word in die buitenste energievlakke gevind ✓ ✓

Core electrons are electrons in the inner energy levels of an atom. ✓ ✓

Kernelektrone word in die binneste energievlakke van die atoom gevind ✓ ✓

(4)

[17]

QUESTION/VRAAG 9

- 9.1 Heat is a form of energy (that can cause a rise in the temperature of an object if transferred to that object)✓✓ while temperature is measure of how hot or cold a body is. ✓✓
Hitte is 'n vorm van energie (wat 'n verhoging in die temperatuur van 'n voorwerp kan veroorsaak) ✓✓ terwyl temperatuur aandui hoe koud of warm 'n liggaam is ✓✓ (4)
- 9.2.1 $126 + 273 \checkmark = 399 \text{ K} \checkmark$ (2)
- 9.2.2 $173 - 173 \checkmark = 0 \text{ }^\circ\text{C} \checkmark$ (2)
- 9.3 Alcohol thermometer ✓ *Alkoholtermometer*✓
 Mercury thermometer ✓ *Kwiktermometer*✓
 Thermoelectric thermometer ✓ *Termo-elektriese termometer*✓ (3)
- 9.4 To control and regulate processes in industries.✓/ *Om prosesse te beheer en kontroleer in industrieë* OR/OF
 It is used in meteorology (to study the weather).✓
Word gebruik in meteorologie/weerkunde OR/OF
 It is used in medicine (taking patient's temperature and theatre temperature)
Gebruik in die mediese wetenskap (om pasiënte se temperatuur te meet of die teater se temperatuur.✓ OR/OF
 It is used in scientific research (Accept: Science laboratories) ✓
Gebruik in wetenskaplike navorsing (Aanvaar Wetenskap-laboratoriums) ✓
 (ANY THREE/ENIGE DRIE) (3)
- 9.5.1 A: Thermometer A: *Termometer*✓
 B: Glass rod B *Glasstafie/Roerstafie*✓
 C: Test Tube C: *Proefbuis*✓
 D: Bunsen Burner D: *Bunsen- of gasbrander*✓
 E: Glass beaker E: *Glasbeker*✓ (5)
- 9.5.2 To stir water✓so that heat is evenly distributed ✓
Om water te roer ✓ sodat hitte eweredig versprei word✓ (2)
- 9.5.3 Because it is flammable
Omdat dit vlambaar is ✓✓ (2)

[23]**TOTAL/TOTAAL: 150**