



education

Department of
Education
FREE STATE PROVINCE

CONTROL TEST / *KONTROLETOETS*

GRADE 10 / *GRAAD 10*

**TECHNICAL SCIENCES
*TEGNIJSE WETENSKAPPE***

MEMORANDUM

SEPTEMBER 2019

MARKS: 100 / *PUNTE: 100*

TIME: 2 HOURS / *TYD: 2 UUR*

**This memorandum consists of five pages.
*Hierdie memorandum bestaan uit vyf bladsye.***

QUESTION 1 / VRAAG 1

- | | | | |
|-----|------|------|------|
| 1.1 | A ✓✓ | 1.6 | A ✓✓ |
| 1.2 | A ✓✓ | 1.7 | A ✓✓ |
| 1.3 | A ✓✓ | 1.8 | B ✓✓ |
| 1.4 | A ✓✓ | 1.9 | C ✓✓ |
| 1.5 | D ✓✓ | 1.10 | D ✓✓ |

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QUESTION 2 / VRAAG 2

- 2.1.1 Substances which have both metallic and non-metallic properties.
Accept: substances that mostly have non-metallic properties. ✓✓
Stowwe wat beide metaal- en nie-metaaleienskappe het. Aanvaar: stowwe wat meestal nie-metaaleienskappe het. (2)
- 2.1.2 Silicon/*Silikon* ✓ (1)
- 2.1.3 Paper clip/*Skuifspeld* ✓ (1)
- 2.1.4 Neon ✓ (1)
- 2.2.1 3 ✓ (1)
- 2.2.2 Oxygen/*Suurstof* ✓ (1)
- 2.2.3 O ✓ (1)
- 2.2.4 26 ✓ (1)
- 2.2.5 56 ✓ (1)
- 2.2.6 Na ✓ (1)
- 2.2.7 12 ✓ (1)
- [12]**

QUESTION 3 / VRAAG 3

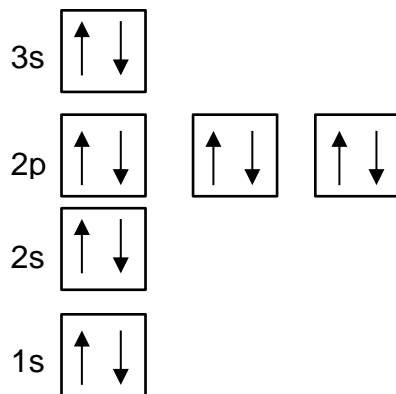
- 3.1 Alkali metals/*Alkalimetale* ✓ (1)
- 3.2 7 ✓ (1)
- 3.3 Noble gases/*Edelgasse* ✓ (1)

- 3.4.1 T (boron/boor/B) ✓ (1)
- 3.4.2 X (oxygen/suurstof/O) ✓ (1)
- 3.4.3 N (hydrogen/waterstof/H) ✓ (1)
- 3.4.4 Q (potassium/kalium/K) ✓ (1)
- 3.4.5 Z (helium/He) ✓ (1)
- 3.4.6 W (phosphorus/fosfor/P) ✓ (1)
- 3.4.7 Y (fluorine/fluor/F) ✓ (1)

3.4.1–3.4.7

Accept answers that refer to the real element or its symbol.
Aanvaar antwoorde wat na die werklike element of sy simbool verwys.

3.5



- Energy level order
Energievlakvolgorde ✓
- 1s and 2s orbitals filled.
1s- en 2s-orbitaal gevul ✓
- 2p orbitals filled.
2p-orbitaal gevul. ✓
- Valence electrons (3s filled).
Valenselektrone (3s gevul). ✓

(4)
[14]

QUESTION 4 / VRAAG 4

- 4.1.1 Negative/Negatief ✓✓ (2)
- 4.1.2 Equal in magnitude (6 nC)/Gelyk in grootte (6 nC) ✓
Positively (oppositely) charged./Positief(teenoorgesteld)gelaai ✓ (2)
- 4.2.1 P ✓ (1)
- 4.2.2 The net charge of an isolated system remains constant.
Die netto lading van 'n geïsoleerde sisteem bly konstant. ✓✓ (2)
- 4.2.3 $Q = \frac{(Q_1 + Q_2)}{2} \checkmark = \frac{-4 \checkmark + 2 \checkmark}{2} = -1 \text{ C} \checkmark$ (4)
- 4.2.4 On rubbing ✓ the hairs obtain the same charge. ✓
Like charges repel. ✓ (3)
- As die hare gevryf ✓ word, kry hulle dieselfde lading. ✓
Gelyke ladings stoot mekaar af. ✓ (3)

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QUESTION 5 / VRAAG 5

5.1 Flow of charge./Vloei van lading. ✓✓ (2)

5.2 P to/na Q. ✓

NEGATIVE MARKING/NEGATIEWE NASIEN

Charge move from positive to negative ✓ terminal through the circuit. ✓
Ladings beweeg van die positiewe na negatiewe pool deur die
stroombaan. ✓ (3)

5.3 $I = \frac{V}{R} \checkmark = \frac{4}{2} \checkmark = 2 \text{ A} \checkmark$ (3)

5.4 **Positive marking from Q5.3./Positiewe nasien vanaf V5.3.**
2 A ✓ (1)

5.5 6 V ✓✓ (2)

5.6 Emf is the total potential difference across the battery (terminals) ✓ when
there is no charge flowing in the circuit. ✓

OR

Maximum amount of energy ✓ given to each coulomb of charge. ✓

Potential difference is the voltage between two points in a circuit ✓ when
there is charge flowing. ✓

Emk is die totale potensiaalverskil oor die battery(pole) ✓ wanneer daar
geen lading in die stroombaan vloei nie. ✓

OF

Maksimum hoeveelheid energie ✓ wat aan een coulomb lading gegee word. ✓

Potensiaalverskil is die spanning tussen twee punte ✓ in a stroombaan
wanneer ladings vloei. ✓

OR/OF Correct alternative/Korrekte alternatief (4)

5.7 $V = \frac{W}{Q} \checkmark$

$$2 \checkmark = \frac{W}{120 \checkmark}$$

$$W = 240 \text{ J} \checkmark$$

(4)
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QUESTION 6 / VRAAG 6

6.1 The same/*Dieselfde* ✓✓ (2)

6.2.1 $R_T = R_1 + R_2 + R_3 ✓ = 20 + 20 + 30 ✓ = 70 \Omega ✓$ (3)

6.2.2 $V_T = V_1 + V_2 ✓$
 $12 = 5,1 + V_2 ✓$
 $V_2 = 6,9 V ✓$ (3)

6.3 $I = \frac{Q}{\Delta t} ✓ = \frac{1,71}{10} ✓ = 0,171 A ✓$ (3)

6.4.1 Increases/*Vermeerder* ✓✓ (2)

6.4.2 Decreases/*Verminder* ✓✓ (2)

6.5.1 Decreases/*Verminder* ✓✓ (2)

6.5.2 Increases/*Vermeerder* ✓✓ (2)

6.6 $\frac{12}{1,5} = 6 \text{ cells} ✓✓$ (2)

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GRAND TOTAL: 100