



education

Department of
Education
FREE STATE PROVINCE

CONTROL TEST / *KONTROLETOETS*

GRADE 10 / *GRAAD 10*

**PHYSICAL SCIENCES
*FISIESE WETENSKAPPE***

MEMORANDUM

SEPTEMBER 2017

MARKS: 100 / *PUNTE: 100*

TIME: 2 HOURS / *TYD: 2 URE*

**This memorandum consists of SIX pages.
*Hierdie memorandum bestaan uit SES bladsye.***

QUESTION 1/VRAAG 1

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

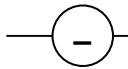
[20]

QUESTION 2 / VRAAG 2

- 2.1 The net charge of an isolated system remains constant ✓ during any physical process ✓
Die netto lading van 'n geïsoleerde sisteem bly konstant ✓ gedurende enige fisiese proses. ✓ (2)

- 2.2 More than ✓ Meer as ✓ (1)

- 2.3 They are oppositely charged ✓ Hulle is teenoorgesteld gelaai. ✓ (1)

- 2.4 Q to/na P ✓  Q has an excess of electrons. ✓
Q het 'n oormaat van elektrone. (2)

- 2.5

$$Q = \frac{Q_1 + Q_2}{2} \checkmark$$

$$Q = \frac{4 + (-12)}{2} \checkmark$$

$$Q = -4C \checkmark$$

 (3)

- 2.6

$$Q = nq_e \checkmark$$

$$4 = n \times 1,6 \times 10^{-19} \checkmark$$

$$n = 2,5 \times 10^{19} \checkmark$$

OR/OF

$$Q = nq_e \checkmark$$

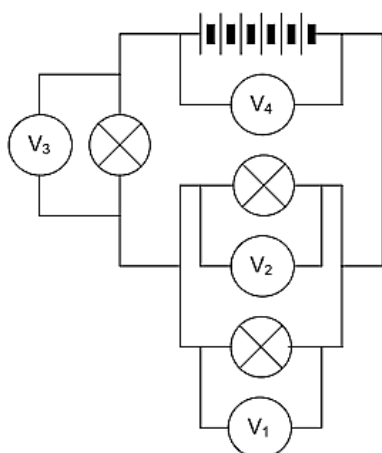
$$-4 = n \times -1,6 \times 10^{-19} \checkmark$$

$$n = 2,5 \times 10^{19} \checkmark$$

 (3)
[12]

QUESTION 3 / VRAAG 3

3.1



Marking criteria

Six cells connected in series with one another and in series with rest of circuit.	✓
Two bulbs in parallel with one in series.	✓
V ₃ connected in parallel across the bulb that is connected in series with other bulbs.	✓
V ₁ and V ₂ connected in parallel across the bulbs that are connected in parallel.	✓

Nasienriglyne

Ses selle in serie verbind met mekaar en in serie met res van stroombaan.	✓
Twee gloeilampe in parallel met een in serie.	✓
V ₃ in parallel verbind met die gloeilamp wat in serie met ander gloeilampe verbind is.	✓
V ₁ en V ₂ in parallel verbind met die gloeilampe in parallel.	✓

(4)

3.2 Potential difference across the ends of a conductor ✓ is the energy transferred per unit electric charge flowing through it. ✓

Potensiaalverskil oor die ente van 'n geleier ✓ is die energie oorgedra per eenheidslading wat daardeur vloei. ✓

(2)

3.3.1 2 V (✓✓)

(2)

3.3.2 4 V (✓✓)

(2)

3.3.3 6 V (✓✓)

Units are no required.

(2)

3.3.4 1 V (✓✓)

Eenhede word nie vereis nie.

(2)

3.4 1 A (✓✓)

(2)

3.5

$$\begin{aligned} \frac{1}{R_p} &= \frac{1}{R_1} + \frac{1}{R_2} \quad \checkmark \\ &= \frac{1}{2} + \frac{1}{2} \quad \checkmark \\ R_p &= 1\Omega \end{aligned}$$

$$\begin{aligned} R_T &= R_p + R \quad \checkmark \\ &= 1 + 2 \quad \checkmark \\ &= 3\Omega \quad \checkmark \end{aligned}$$

(5)

[21]

QUESTION 4 / VRAAG 4

4.1

$$\begin{aligned} W &= VQ \checkmark \\ &= (1,2 \times 10^9)(18) \checkmark \\ &= 2,16 \times 10^{10} \text{ J } \checkmark \end{aligned}$$

(3)

4.2

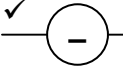
$$\begin{aligned} I &= \frac{Q}{\Delta t} \checkmark \\ &= \frac{18}{2} \checkmark \\ &= 9 \text{ A } \checkmark \end{aligned}$$

(3)

[6]

QUESTION 5 / VRAAG 5

5.1 Dissociation is the process in which solid ionic crystals are broken up into ions ✓ when dissolved in water. ✓
Dissosiasie is die proses waar ioniese kristalle in ione opgebreek word ✓ wanneer dit in water oplos. ✓ (2)

5.2 Yes / Ja ✓  The ions can move ✓ to conduct electricity.
Die ione kan beweeg ✓ om elektrisiteit te gelei. (2)

5.3

$$\begin{aligned} n &= \frac{m}{M} \checkmark \\ n &= \frac{2,235}{74,5} \checkmark \\ n &= 0,03 \text{ mol } \checkmark \\ c &= \frac{n}{v} \checkmark \\ c &= \frac{0,03}{0,25} \checkmark \\ c &= 0,12 \text{ mol} \cdot \text{dm}^{-3} \checkmark \end{aligned}$$

(6)

[10]

QUESTION 6 / VRAAG 6

6.1.1 0°C OR/OF 273 K ✓ (1)

6.1.2 101,3 kPa ✓ (1)

6.2.1
$$n = \frac{m}{M} \checkmark$$
$$= \frac{7,2}{48} \checkmark$$
$$= 0,15 \text{ mol} \checkmark$$
 (3)

6.2.2
$$n = \frac{m}{M} \checkmark$$
$$0,15 = \frac{m}{46} \checkmark$$
$$m = 6,9 \text{ g} \checkmark$$
 (3)

6.2.3
$$n = \frac{V}{V_M} \checkmark$$
$$0,15 = \frac{V}{22,4} \checkmark$$
$$m = 3,36 \text{ dm}^3 \checkmark$$
 OR/OF
$$1 \text{ mol} \Rightarrow 22,4 \text{ dm}^3 \checkmark$$
$$0,15 \text{ mol} \Rightarrow (0,15)(22,4) \text{ dm}^3 \checkmark$$
$$= 3,36 \text{ dm}^3 \checkmark$$
 (3)
[11]

QUESTION 7 / VRAAG 7

7.1.1 Na₂CO₃ OR/OF sodium carbonate / *natriumkarbonaat* (✓✓) (2)

7.1.2 Na₂SO₄ OR/OF sodium sulphate / *natriumsulfaat* (✓✓) (2)

7.2.1 BaCO₃ OR/OF barium carbonate / *bariumkarbonaat* (✓✓) (2)

7.2.2 BaSO₄ OR/OF barium sulphate / *bariumsulfaat* (✓✓) (2)

7.3 Acid-base / *Suur-basis* ✓ (1)
[9]

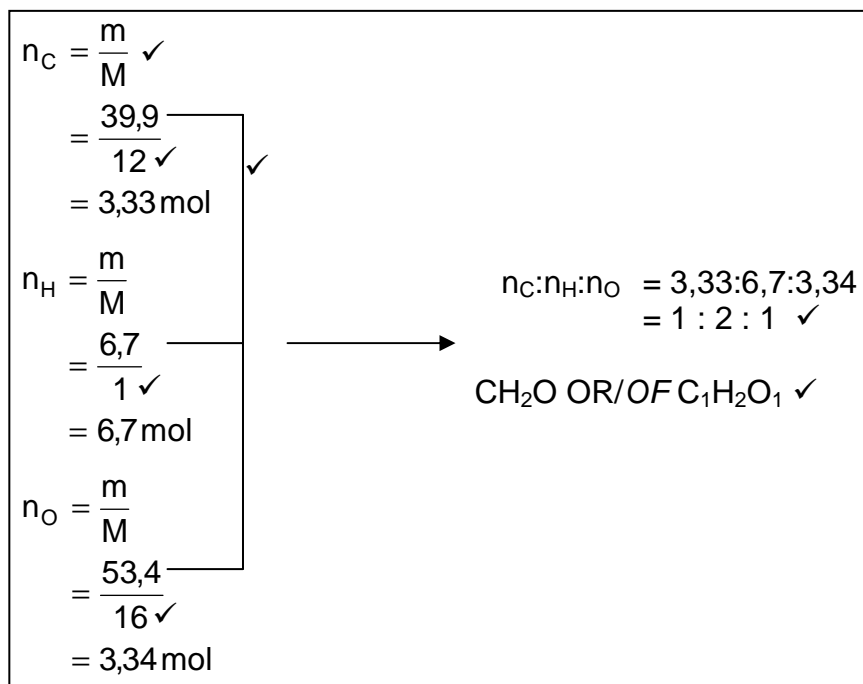
QUESTION 8 / VRAAG 8

- 8.1 Empirical formula is the simplest whole-number ratio ✓ of atoms in a compound. ✓

Empiriese formule is die eenvoudigste heelgetalverhouding ✓
van atome in 'n verbinding. ✓

(2)

8.2



(7)

- 8.3 $\text{C}_2\text{H}_4\text{O}_2$ (✓✓)

(2)

[11]

GRAND TOTAL / GROOTTOTAAL: 100