



education

Department of
Education
FREE STATE PROVINCE

CONTROL TEST / *KONTROLETOETS*

GRADE 10 / *GRAAD 10*

**PHYSICAL SCIENCES
*FISIESE WETENSKAPPE***

MEMORANDUM

MARCH 2019 / *MAART 2019*

MARKS: 100 / *PUNTE: 100*

TIME: 2 HOURS / *TYD: 2 UUR*

This memorandum consists of SEVEN pages
Hierdie memorandum bestaan uit SEWE bladsye.

QUESTION 1 / VRAAG 1

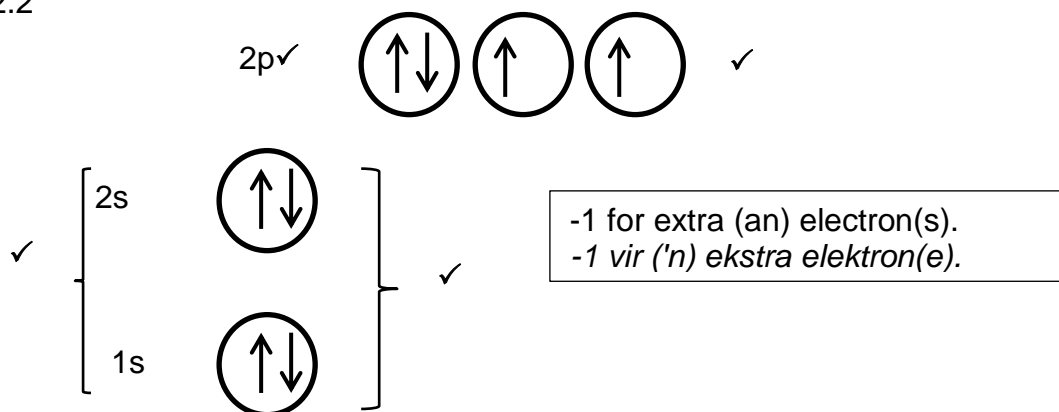
- 1.1 A ✓✓
- 1.2 C ✓✓
- 1.3 A ✓✓
- 1.4 B ✓✓
- 1.5 D ✓✓
- 1.6 C ✓✓
- 1.7 D ✓✓
- 1.8 D ✓✓
- 1.9 A ✓✓
- 1.10 B ✓✓

[20]

QUESTION 2 / VRAAG 2

- 2.1.1 D ✓ (1)
- 2.1.2 A ✓ (1)
- 2.1.3 B ✓ (1)
- 2.1.4 C ✓ (1)
- 2.1.5 C ✓ (1)
- 2.1.6 C ✓ (1)
- 2.1.7 A or/of B or/of D ✓ (1)
- 2.1.8 C ✓ (1)
- 2.2
- 2.2.1 16 ✓ (1)

2.2.2

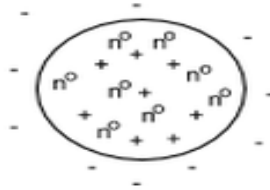


(4)

2.2.3 $\frac{1s^2 2s^2}{\checkmark \checkmark} \frac{2p^4}{\checkmark}$

(2)

2.2.4



Criteria for marking/Nasienkriteria
Count from drawing:/Tel vanaf skets
<ul style="list-style-type: none"> • 8 protons/protone ✓ • 7 – 10 neutrons/neutrone ✓ • 10 electrons/elektrone ✓ • electrons outside the nucleus/elektrone buite die kern ✓

- 2.3.1 Atoms of the same element having the same number of protons✓, but different numbers of neutrons. ✓/ Atome van dieselfde element met dieselfde aantal protone, maar verskillende aantal neutrone. (4)
(2)

2.3.2 Relative atomic mass = $\frac{(99,759 \times 16) \checkmark + (0,037 \times 17) \checkmark + (0,204 \times 18) \checkmark}{100 \checkmark} = 16 \checkmark$

Relatiewe atoommassa = $\frac{(99,759 \times 16) \checkmark + (0,037 \times 17) \checkmark + (0,204 \times 18) \checkmark}{100 \checkmark} = 16 \checkmark$

(5)
[26]

QUESTION 3 / VRAAG 3

- 3.1.1 Energy needed per mole to remove the first electron from an atom✓ in the gaseous phase. ✓ / Energie per mol benodig om die eerste elektron uit 'n atoom in die gasfase te verwyder. (2)
- 3.1.2 The ionization energy decreases for the noble gases from top to bottom in the periodic table. ✓✓ **OR**
As atom number increases the ionisation energy decreases /
Die ioniseringsenergie verminder van die top tot onder vir die edelgasse in die periodieke tabel. **OF**
Namate atoomgetalle toeneem, verminder die ionisasie energie (2)
- 3.1.3 **NEGATIVE MARKING / NEGATIEWE NASIEN**
Size of the atom increases from top to bottom in the periodic table. ✓
Attractive forces between the nucleus and the outer electrons decreases. ✓
Less energy is needed to remove the electron from the outer energy level. ✓/
Die grootte van die atoom styg van bo na onder in die periodieke tabel.
Aantrekkingskragte tussen die kern en die buitenste elektrone neem af.
Minder energie is nodig om die elektron uit die buitenste energievlak te verwyder. (3)
- 3.1.4 $5 \text{ (kJ}\cdot\text{mol}^{-1})$ ✓ (1)
- 3.1.5 They are both in group 1 / alkali metals / metals. ✓✓ / Beide is in groep 1/
alkali-metale / metale (2)
- 3.2.1 Period 2 in the periodic table. ✓/ Periode 2 op die periodieke tabel. (1)
- 3.2.2 The higher the atomic number the lower the melting point. ✓/ Hoe groter die atoomgetal hoe laer is die smeltpunt. (1)
- 3.2.3 The higher the atomic number the smaller the atom. ✓/ Hoe groter die atoomgetal hoe kleiner is die atoom. (1)
- 3.2.4 Electronegativity is a measure of the tendency of an atom in a molecule to attract bonding electrons. ✓✓/ Elektronegatiwiteit is 'n maatstaf van die neiging van 'n atoom in 'n molekule om verbindingselektrone aan te trek. (2)
- 3.2.5 Neon is unable to combine to any element and share an electron pair. ✓✓ **OR**
The second energy level is completely filled with electrons. / Neon kan nie met enige element kombineer en 'n elektronpaar deel nie. **OF** Die tweede energievlak is heeltemal gevul met elektrone. (2)

[17]

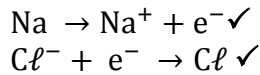
QUESTION 4 / VRAAG 4

4.1 NaCl ✓ (1)

4.2 **NEGATIVE MARKING / NEGATIEWE NASIEN**

Sodium donates its electrons to chlorine ✓ and form positive ion while chlorine forms a negative ion. ✓ / Natrium skenk 'n elektron aan chloor en vorm 'n positiewe ioon en chloor vorm 'n negatiewe ioon.

Accept:/ Aanvaar



(2)

4.3 HCl ✓ (1)

4.4 $\text{H} : \ddot{\text{Cl}} :$ ✓✓ (2)

4.5.1 NaCl forms crystal lattice where the ions are not able to move ✓✓ and therefore cannot conduct electricity. / NaCl vorm 'n kristalrooster waar die ione nie kan beweeg nie en dus nie elektrisiteit kan gelei nie. (2)

4.5.2 Na atoms are held together by metal bonding which means delocalised electrons are free to move ✓✓ and conduct electricity. / Na atome word aangetrek deur 'n metaalbinding waar gedelokaliseerde elektrone vry is om te beweeg en elektrisiteit gelei. (2)
[10]

QUESTION 5 / VRAAG 5

5.1 B ✓ (1)

5.2 C ✓ (1)

5.3 A ✓ (1)

5.4 E ✓ (1)

5.5 D ✓ (1)
[5]

QUESTION 6 / VRAAG 6

6.1 A single disturbance in a medium. ✓✓ / 'n Enkele versteuring in 'n medium. (2)

6.2 Transverse pulse / *Transversale puls* ✓ the movement that creates the wave is perpendicular to the direction of propagation of the wave. ✓ / *Die beweging wat van die deeltjies van die golf is loodreg op die rigting van die golf.* (2)

6.3.1 A single pulse / Constructive interference / Superposition will take place ✓✓ with an amplitude of 0,04 m ✓ / 'n Enkele puls / konstruktiewe interferensie / superposisie met 'n amplitude van 0,04 m vorm. (3)

6.3.2 Longitudinal wave ✓ / *Longitudinale golf* (1)
[8]

QUESTION 7 / VRAAG 7

7.1 A and/en E (✓✓) (2)

7.2 $f = \frac{1}{T}$ ✓
 $= \frac{1}{2}$ ✓
 $= 0,5 \text{ Hz.}$ ✓
OR / OF
 $f = \frac{n}{\Delta t}$ ✓
 $= \frac{1}{2}$ ✓
 $= 0,5 \text{ Hz}$ ✓ (3)

7.3 **POSITIVE MARKING FROM 7.2. / POSITIEWE NASIEN VANAF 7.2.**
 $v = \lambda f$ ✓
 $= 0,5 \times 0,3$ ✓
 $= 0,15 \text{ m} \cdot \text{s}^{-1}$ ✓
OR / OF
 $v = \frac{\Delta x}{\Delta t}$ ✓
 $= \frac{0,30}{2}$ ✓
 $= 0,15 \text{ m} \cdot \text{s}^{-1}$ ✓ (3)

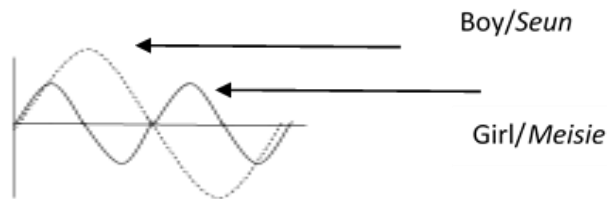
7.5 Downwards ✓ / *Afwaarts* (1)
[9]

QUESTION 8 / VRAAG 8

8.1 The particles in the string vibrate parallel to the string ✓. As one particle vibrates it causes the particle next to it to vibrate ✓ and as a result the sound travels through the string. / *Die deeltjies in die tou vibreer parallel aan die tou. Soos een deeltjie vibreer, veroorsaak dit dat die deeltjie langsaan vibreer en gevolglik beweeg die geluid deur die tou.* (2)

8.2 Sound are able to propagate better through a solid than through a gas. ✓ / *Klank word beter voortgeplant in 'n vaste stof as in 'n gas.* (1)

8.3



Greater amplitude ✓ Larger wavelength ✓ / *Groter amplitude en groter golglengte*

(2)
[5]

GRAND TOTAL/ GROOT TOTAAL: 100