education

Department of Education
FREE STATE PROVINCE

CONTROL TEST / *KONTROLETOETS*

GRADE 10 / *GRAAD 10*

PHYSICAL SCIENCES
FISIESE 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.

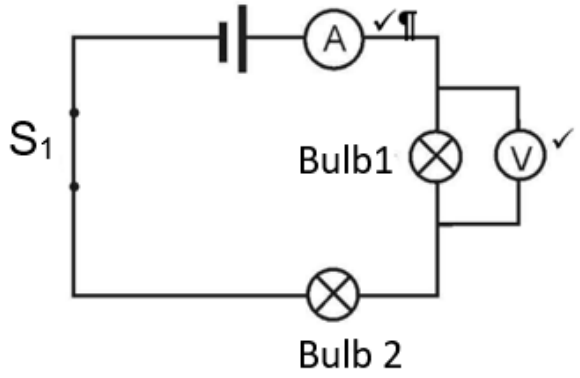
QUESTION 1 / *VRAAG 1*

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

QUESTION 2 / *VRAAG 2*

2.1 Rate of flow of electric charges. ✓✓
Tempo van elektriese ladingvloei. (2)

2.2



(2)

2.3 $I_C = 0{,}6\ A$ ✓ (1)

2.4 $I = \frac{Q}{\Delta t}$ ✓
$0{,}6 = \frac{Q}{120}$ ✓
$Q = 72\ C$ ✓ (3)

2.5 $V_{CD} = 1{,}2\ V$ ✓

The resistance of the bulbs are different **OR** V_{CD} is the difference between the emf and V_{AB} **OR** the total potential difference across AD is $1{,}8\ V + 1{,}2\ V$. ✓

*Die weerstand van die gloeilampe is verskillend **OF** V_{CD} is die verskil tussen die emk en V_{AB} **OF** die totale potensiaalverskil oor AD is 1,8 V + 1,2 V.* (2)

2.6 Bulb one is brighter. / *Gloeilamp een is helderder.* ✓
Current in the lamps is the same. ✓ Stroom in die gloeilampe is dieselfde.
Potential difference across one ✓ Potensiaalverskil oor een is groter.
is higher. (3)
[13]

QUESTION 3 / *VRAAG 3*

3.1 Is the energy transferred per unit electric charge flowing through it. ✓✓
Die energie oorgedra per eenheidslading wat daardeur vloei. (2)

3.2 $V = \frac{W}{Q}$ ✓
$= \frac{90}{20}$ ✓
$= 4{,}5\ V$ ✓ (3)

3.3 $\frac{4{,}5}{3} = 1{,}5\ V$ ✓ (1)

3.4 $I = \frac{Q}{\Delta t}$ ✓
$= \frac{30}{40}$ ✓
$= 0{,}75\ A$ ✓ (3)

3.5 $\frac{0{,}75}{3}$ ✓
$= 0{,}25\ A$ ✓ (2)
[11]

QUESTION 4 / *VRAAG 4*

4.1.1 Displacement is the change in position/difference in position in space. ✓✓
Verplasing is die verandering van posisie/verskil in posisie in die ruimte. (2)

4.1.2 The distance travelled divided by the time.
Die afstand afgelê gedeel deur die tyd. ✓✓ (2)

4.2 Scalar/*skalaar* ✓
Negative marking / *Negatiewe nasien*
It has magnitude only./*Dit het slegs grootte.* ✓ (2)

4.3 $\text{Average speed} = \frac{\text{total distance}}{\text{total time}}$ ✓
$= \frac{10000}{3900}$ ✓
$= 2{,}56\ m \cdot s^{-1}$ ✓ (4)

4.4 $v = \frac{\Delta x}{\Delta t}$ ✓ **OR/*OF*** $v = \frac{\Delta x}{\Delta t}$ ✓

$= \frac{3000}{1200}$ ✓ $= \frac{-3000}{1200}$ ✓
$= 2{,}5\ m \cdot s^{-1}$ $= -2{,}5\ m \cdot s^{-1}$

v = 2,5 m·s^{-1} towards his house/*in die rigting van sy huis*. ✓ (3)

4.5 $v = \frac{\Delta x}{\Delta t}$ **OR/*OF*** $v = \frac{\Delta x}{\Delta t}$

$= \frac{4000}{900}$ ✓ $= \frac{-4000}{900}$ ✓

$= 4{,}44\ m \cdot s^{-1}$ $= -4{,}44\ m \cdot s^{-1}$

v = 4,44 m·s^{-1} towards the school/*in die rigting van skool* ✓ (2)

[15]

QUESTION 5 / *VRAAG 5*

5.1 40 m·s^{-1} (1)

5.2 20 m·s^{-1} ✓ west/*wes* ✓ (2)

5.3 The <u>speed/velocity decreases/car slows down</u> ✓ <u>uniformly</u> ✓ and finally the car <u>stops</u>.✓

Die <u>spoed/snelheid verminder/kar verminder spoed/snelheid</u> ✓ teen <u>konstante temp/uniform</u> ✓ en <u>stop</u>.✓

(3)

5.4 $a = \frac{\Delta y}{\Delta x}$✓

$= \frac{(0)-40}{25-20}$ ✓✓

$= -8\ m \cdot s^{-2}$

$= 8\ m \cdot s^{-2}$ opposite direction ;west/*teenoorgestelde rigting/wes* ✓ (4)

5.5 $v_f = v_i + a\Delta t$ ✓

= 40 ✓ + (-8)(6,3) ✓

= -10,4 m·s^{-1}

v_f = 10,4 m·s^{-1} west/*wes* ✓ (4)

5.6 Equal to/*Gelyk aan* ✓ (1)

5.7 Same gradient/*Dieselfde gradiënt* ✓ (1)

5.8 Displacement = Area under the graph✓

$= ½\ (40 + 30)(5)$✓ $+ (15x40)$✓ $+ ½\ (5\ x40)$✓ $- [½\ (2{,}5\ x\ 20)]$✓

$= 850$ m

$= 850$ m east/*oos*✓

Accept a solution with equations of motion.
Aanvaar bewegingsvergelykings as oplossing. (6)

[22]

QUESTION 6 / *VRAAG 6*

6.1.1 The maximum amount of a substance (the solute) that may be dissolved in another (the solvent).✓✓ (2)

6.1.2 Hydration is the process in which ions✓ become surrounded by water molecules. ✓ (2)

6.1.3 $Na_2SO_4(s) \rightarrow 2Na+ (aq)$ ✓ + $SO_4^{2-}(aq)$ ✓ phases ✓ (3)

$A\ell_2(CO_3)_3(s) \rightarrow 2A\ell_3+$✓ (aq) + $3CO_3^{2-}$(aq) ✓ phases✓ (3)

6.2 Sugar does not form ions when sugar dissolves in water. ✓
There are no charges that can move✓ to produce a current. ✓ (3)

6.3.1 Higher concentration of ions in a solution; greater current ✓✓

6.3.2 Some substances dissolve to a greater extent than others. The greater the extent of solution the greater the current. ✓✓ (4)

6.5 Precipitation reaction ✓

NEGATIVE MARKING

One of the products is a solid.✓ (2)
[19]

GRAND TOTAL / *GROOTTOTAAL*: 100