LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF EDUCATION

GRADE/*GRAAD* 10

Stanmorephysics.com

PHYSICAL SCIENCES/*FISIESE WETENSKAPPE*

CONTROL TEST/*KONTROLE TOETS* 1

18 MARCH/*MAART* 2026

MARKING GUIDELINES/*NASIENRIGLYNE*

Stanmorephysics.com

MARKS/*PUNTE* **: 100**

This marking guideline consists of 7 pages/*Hierdie nasienriglyne bestaan uit 7 bladsye*

Copyright reserved/*Kopiereg voorbehou*

QUESTION 1: MULTIPLE OF CHOICE QUESTIONS/*VRAAG 1: MEERVOUDIGE KEUSE VRAE*





1.1	C✓✓	(2)
1.2	B✓✓	(2)
1.3	C✓✓	(2)
1.4	A✓✓	(2)
1.5	C✓✓	(2)
1.6	C✓✓	(2)
1.7	A✓✓	(2)

[14]

QUESTION 2/*VRAAG 2*

2.1 The algebraic sum of the amplitudes of two pulses that occupy the same space at the same time. ✓✓/ *Die algebraïese som van die amplitudes van twee pulse wat dieselfde ruimte op dieselfde tyd beset* (2)

2.2 Destructive interference ✓/ *Destruktiewe interferensie*

The crest of one pulse from the left overlaps with the trough from the right, resulting in a pulse of reduced amplitude. ✓✓/ *Die kruin van een puls van links oorvleuel met die trog van regs, wat lei tot 'n puls van verminderde amplitude.* (3)

2.3 Right✓/*regs* (1)

2.4

$$W+(-8) = -4\checkmark$$
$$W = 4\text{cm}\checkmark$$

(2)

[8]

QUESTION 3/*VRAAG 3*

3.1. Transverse wave✓/ *Transversale golf* (1)

3.2. 1,5 m✓ (1)

3.3. The distance between two successive points in phase ✓✓/ *Die afstand tussen twee opeenvolgende punte in fase* (2)

3.4. $\lambda = \frac{distance}{number\ of\ waves}$ / $\lambda = \frac{\text{afstand}}{\text{aantal golwe}}$

$= \frac{6}{1,5}$✓

$= 4m$✓ (2)

Stanmorephysics.com

3.5. A and/*en* E✓

OR/*OF*

D and/*en* F✓ (1)

3.6. 2,5 / $2\frac{1}{2}$ waves/*golwe*✓ (1)

3.7.

3.7.1 $f = \frac{1}{T}$✓

$= \frac{1}{0,5}$✓

$= 2Hz$✓ (3)

3.7.2 **POSITIVE MARKING FROM 3.4 AND 3.7.1/*POSITIEWE NASIEN VANAF 3.4 EN 3.7.1***

v = f.λ✓

$= 2 \times 4$✓

$= 8\ m.s^{-1}$✓

(3)

[15]

QUESTION 4/*VRAAG 4*

4.1. A wave in which the particles of the medium vibrate parallel to the direction of motion of the wave. ✓✓/ *'n Golf waarin die deeltjies van die medium parallel met die bewegingsrigting van die golf vibreer* (2)

4.2. Compression is a region of high pressure in a longitudinal wave. ✓✓/ *Verdigting is 'n gebied van hoë druk in 'n longitudinale golf*

Rarefaction is the region of low pressure in a longitudinal wave. ✓✓/ *Verdunning is die gebied van lae druk in 'n longitudinale golf* (4)

4.3. $v = \frac{Distance}{Time}$ / $v = \frac{af\ stand}{tyd}$

$= \frac{6}{2}$✓✓

$= 3\ m.s^{-1}$✓ (3)

[9]

QUESTION 5/*VRAAG 5*

5.1.

5.1.1 Distance travelled by the sound✓/ *Afstand wat deur die klank afgelê word* (1)

5.1.2 The speed of sound✓./ *Die spoed van klank*

Accept: The time taken for sound to travel✓/ *Aanvaar: Die tyd wat dit neem vir klank om te afstand af te lê* (1)

5.1.1. How does temperature affect speed of sound in air? ✓✓

OR

What is the effect of temperature on the speed of sound in air? ✓✓ (2)

5.2 $speed = \frac{Distance}{Time}$ /spoed $= \frac{\text{afstand}}{\text{tyd}}$

$= \frac{75}{0,236}$✓✓

$= 317,797\ m.s^{-1}$✓ (3)

Copyright reserved/*Kopiereg voorbehou*

5.3

5.3.1 Wave A✓/*golf A*

It has higher frequency✓/ *Dit het 'n hoër frekwensie* (2)

5.3.2 Wave A✓/ *golf A* (1)

5.4

5.4.1 It is a sound with frequency higher than 20 kHz up to about 100 kHz✓✓ / *Dit is 'n klank met 'n frekwensie hoër as 20 kHz tot ongeveer 100 kHz* (2)

5.4.2 Time taken for sound waves to travel towards the moth / Tyd *wat dit neem vir klankgolwe om na die mot te beweeg:*

$= \frac{0,08}{2}$✓

=0,04 m

$Distance = speed \times time$ /afstand = spoed x tyd

$= 340 \times 0,04$ ✓

$= 13,6\ m$ ✓ (3)

[15]

QUESTION 6/*VRAAG 6*

6.1. Electromagnetic radiation can best be explained as wave nature and as a particle nature✓✓/ *Elektromagnetiese straling kan die beste verduidelik word as golfaard en as 'n deeltjieaard* (2)

6.2. Acceleration of charges✓/ *Versnelling van ladings* (1)

6.3.
- Can travel through a vacuum✓/ *Kan deur 'n vakuum beweeg*
- Have a speed of $3\times 10^{8} m.s^{-1}$✓/ *Het 'n spoed van* $3\times 10^{8} m.s^{-1}$ (2)

6.4.

6.4.1. TV remote: Infrared waves✓/ *TV-afstandbeheer: Infrarooi golwe* (1)

6.4.2. Cellphone: Radio waves✓/ *Selfoon: Radiogolwe* (1)

6.5. Treatment of cancer✓/ *Behandeling van kanker* (1)

Stanmorephysics.com

6.6.

6.6.1 Photon is a packet of energy found in light✓✓/ *Foton is 'n pakkie energie wat in lig voorkom* (2)

6.6.2 $E = \frac{hc}{\lambda}$✓

$E = \frac{(6.63\times10^{-34})(3\times10^{8})}{850\times10^{-9}}$✓✓

$E = 2{,}34 \times 10^{-19}\ J$✓ (4)

[14]

Stanmorephysics.com

QUESTION 7/*VRAAG 7*

7.1. To prevent charges from leaking✓/ *Om te verhoed dat ladings lek* (1)

7.2. The net charge of an isolated system remains constant during any physical process. ✓✓/ *Die netto lading van 'n geïsoleerde stelsel bly konstant tydens enige fisiese proses* (2)

7.3. Sphere L✓/*Sfeer L* (1)

7.4 7.4.1 $Q_{NEW} = \frac{Q_V + Q_L}{2}$✓

$= \frac{(-5\times10^{-9})+(9\times10^{-9})}{2}$✓

$= 2 \times 10^{-9}\ C$✓ (3)

7.4.2 **POSITIVE MARKING FROM 7.4.1/** ***POSITIEWE NASIEN VANAF 7.4.1***

$\Delta Q = Q_{new} - Q_{Initial}$

$= 2 \times 10^{-9} - (-5 \times 10^{-9})$ ✓

$= 7 \times 10^{-9}$✓ (2)

7.4.3 **POSITIVE MARKING FROM 7.4.2/** ***POSITIEWE NASIEN VANAF 7.4.2***

$n = \frac{Q}{e^-}$✓

$= \frac{7\times10^{-9}}{1{,}6^{-1}}$✓

$= 4{,}375 \times 10^{10}\ (electrons/elekrone)$ ✓ (3)

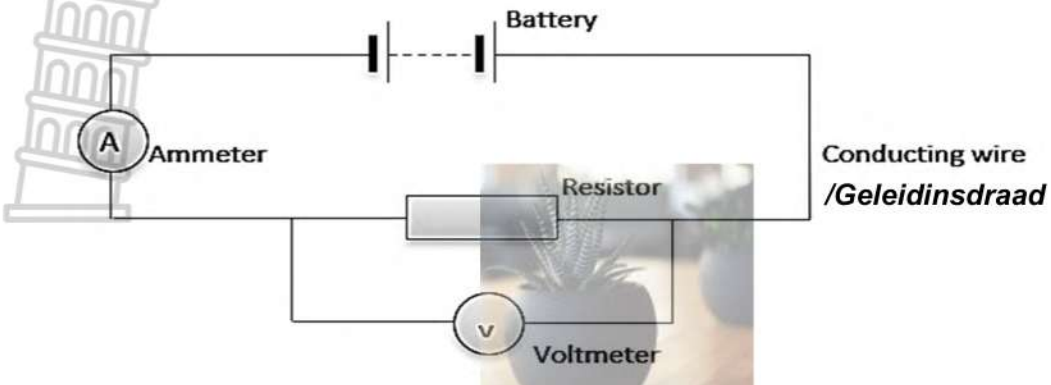
7.5 Charge quantization✓/ *Ladingkwantisering* (1)

[13]

Copyright reserved/*Kopiereg voorbehou*

QUESTION 8/*VRAAG 8*

8.1



Marking criteria/*Nasien kriteria*	
Cells connected correctly/ *Selle korrek gekoppel*	✓
Voltmeter connected across the resistor/ battery/ *Voltmeter gekoppel oor die weerstand/battery*	✓
Ammeter connected correctly/ *Ampèremeter korrek gekoppel*	✓
All labels/ *Alle byskrifte*	✓

(4)

8.2

8.2.1 Current strength is the rate of flow of charge. ✓✓/ *Stroomsterkte is die tempo van vloei van lading* (2)

8.2.2 $Q = I\Delta t$✓

$= 0{,}5 \times 120$✓

$= 60\ C$✓ (3)

8.2.3 POSITIVE MARKING FROM 8.2.2/ *POSITIEWE NASIEN VANAF 8.2.2*

$v = \frac{W}{Q}$✓

$12 = \frac{W}{60}$✓

$= 720\ J$✓ (3)

[12]

TOTAL/*TOTAAL* = 100 MARKS/*PUNTE*

Copyright reserved/*Kopiereg voorbehou*