LIMPOPO
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DEPARTMENT OF
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NATIONAL

SENIOR CERTIFICATE

GRADE 10

PHYSICAL SCIENCES: PHYSICS (P1)/*FISIESE WETENSKAPPE: FISIKA (V1)*

JUNE/*JUNIE* 2026

MARKING GUIDELINES/*NASIENRIGLYNE*

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MARKS/*PUNTE*: 100

This Marking Guideline consist of 10 pages including the cover page./*Hierdie nasienriglyn bestaan uit 10 bladsye insluitend die voorblad.*

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QUESTION 1/*VRAAG 1*

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

[16]



QUESTION 2/*VRAAG 2*

2.1 Algebraic sum of the amplitudes of two pulses that occupy the same space at the same time. ✓✓/ *Algebraïese som van die amplitudes van twee pulse wat dieselfde ruimte op dieselfde tyd beset*

(2)

2.2 Destructive interference ✓/ *Destruktiewe interferensie*

(1)

2.3 Resulting pulse/*resulterende puls* = A+ B
= 6 + (- 24) ✓
= -18 cm ✓

Amplitude = 18 cm or/*of* 0,18 m (Accept/a*anvaar* -18 cm or/*of* -0,18 m)

(2)

2.4 Remains the same. ✓/*Bly dieselfde*

(1)

2.5 $V_A = \frac{a}{t}$ ✓

$= \frac{4}{0,5}$ ✓

$= 8\ m.s^{-1}$

$\therefore V_A = V_B = 8\ m.s^{-1}$ ✓

(3)

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QUESTION 3/*VRAAG 3*

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

3.2

3.2.1 50 cm✓ or/*of* 0,5 m (1)

3.2.2 100cm✓ or/*of* 1 m (1)

3.3

3.3.1 $T = \frac{1}{f}$ ✓

$= \frac{1}{30}$ ✓

= 0,03 s✓ (3)

3.3.2 **OPTION 1/*OPSIE 1***
POSITIVE MARKING FROM 3.2.1/*POSITIEWE NASIEN VANAF 3.2.1*

v = f λ✓

= (30)(0,5) ✓

= 15m.s^{-1}✓

$\lambda = \frac{50}{100} = 0,5$ m

OPTION 2/*OPSIE 2*
POSITIVE MARKING FROM 3.2.1 AND 3.3.1/*POSITIEWE NASIEN VANAF 3.2.1 EN 3.3.1*

Speed = $\frac{\text{distance}}{\text{time}}$ ✓ / $spoed = \frac{afstand}{tyd}$

$= \frac{0,5}{0,03}$ ✓

= 16,67 m.s^{-1} ✓ **Accept/*aanvaar*:** 15ms^{-1} to 16,67 m.s^{-1} (3)

POSITIVE MARKING FROM 3.2.1/*POSITIEWE NASIEN VANAF 3.2.1*

3.3.3 Distance= λ × Number of waves/*Afstand = λ x aantal golwe*

= 0,5 × 3 ✓

= 1,5 m ✓ (2)

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3.3.4 **POSITIVE MARKING FROM 3.3.2 AND 3.3.3/ *POSITIEWE NASIEN VAN 3.3.2 EN 3.3.3***

OPTION 1/*OPSIE 1*	**OPTION 2/*OPSIE 2***	**OPTION 3/*OPSIE 3***
t = 3 × 0,03 ✓ = 0,09 s ✓	Speed = $\frac{distance}{time}$ 15 = $\frac{1,5}{time}$ ✓ time = $\frac{1,5}{15}$ time = 0,1 s✓	Speed = $\frac{distance}{time}$ 15 = $\frac{0,5}{time}$ time for 1 wave= 0,03 s time = 3 × 0,03 ✓ = 0, 09 s ✓

(2)

3.4 Remains constant✓/*Bly konstant*

-Frequency does not depend on amplitude.✓/ *Frekwensie hang nie van amplitude af nie* (2)

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QUESTION 4/*VRAAG 4*

4.1

4.1.1 A- Rarefaction ✓/ *Verdunning*

C- Wavelength ✓/ *Golflengte* (2)

4.1.2 - They are not separated by a whole number of wavelengths. ✓/ *Hulle word nie deur 'n hele aantal golflengtes geskei nie*

OR/*OF*

- They are not moving in the same direction at the same time✓. / *Hulle beweeg nie in dieselfde rigting op dieselfde tyd nie* (1)

4.1.3 $v = f\,\lambda$ ✓

$340 = f\,(0,1)$ ✓

$f = 3\,400Hz$

Yes, ✓/*Ja*

Human ear can hear the frequency because it is less than 20 000Hz.✓/ *Die menslike oor kan die frekwensie hoor omdat dit minder as 20 000 Hz is.*

OR/*OF*

3400Hz < 20 000Hz

OR/OF

3,4kHz < 20kHz (4)

4.1.4 No sound will be produced. ✓ In vacuum there is no matter which sound can travel on/ sound require a medium to travel on ✓/ *Geen klank sal geproduseer word nie. In vakuum maak dit nie saak watter klank kan beweeg nie/klank benodig 'n medium om te beweeg* (2)

4.2

4.2.1 Reflection of sound from hard surface. ✓/ *Weerspieëling/refleksie van klank vanaf harde oppervlak* (1)

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4.2.2 **OPTION 1/*OPSIE 1***

Bird/*Voël* A	**Bird/*Voël* B**
$v = \frac{d}{t}$ ✓	$d = 100 - 31,96$
$340 = \frac{d}{0,094}$ ✓	$= 68,04\ m$ ✓
$d = 31,96\ m$	

Boy is closer to bird A than bird B✓, therefore Bird A will hear the sound first. ✓/ *Seun is nader aan voël A as voël B, daarom sal Voël A die geluid eerste hoor.*

OPTION 2/*OPSIE 2*

$v = \frac{d}{t}$ ✓

$340 = \frac{d}{0,094}$ ✓

$d = 31,96\ m$

$distance\ \text{of}\ bird\ A/afstand\ vanaf\ voël\ A = 31,96\ m$

Distance of bird B/*afstand vanaf voël B*

$= 100 - 31,96$

$= 68,04\ m$

$speed/spoed = \frac{d}{t}$

$340 = \frac{68,04}{t}$ ✓

$t = 0,20\ s$

It will take more time for sound to reach bird B than bird A✓, therefore bird A is closer to the boy.✓/ *Dit sal meer tyd neem vir klank om voël B te bereik as voël A, daarom is voël A nader aan die seun.* (5)

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QUESTION 5/*VRAAG 5*

5.1 Packet of energy found in light. ✓✓/ *Pakkie energie wat in lig gevind word* (2)

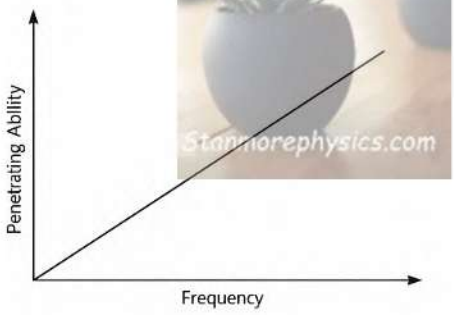
5.2

5.2.1 $E = hf$ ✓
$= (6,63 \times 10^{-34})(3,03 \times 10^{19})$ ✓
$= 2,01 \times 10^{-14} J$ ✓ (3)

5.2.2 $E = \frac{hc}{\lambda}$ ✓
2×10^{-17} ✓ $= \frac{(6,63 \times 10^{-34})(3 \times 10^{8})}{\lambda}$ ✓
$\lambda = 9,95 \times 10^{-9} m$ ✓ Accept/*aanvaar*: $9,95 \times 10^{-9} m$ (4)

5.3 B✓, it has the greatest frequency. ✓/*dit het die grootste frekwensie*
Or/*Of*
B, it has the greatest energy. /*dit het die hoogste energie* (2)

5.4 Frequency vs penetrating ability graph/ *Frekwensie teenoor penetrasievermoë-grafiek*



Marking criteria/*Nasien kriteria*

Criteria/*kriteria*	**Marks/*Punte***
Correct labelling of axes/*korrekte opskrifte vir asse*	1
Correct shape of the graph/*korrekte vorm van grafiek*	1

(2)

5.2
- Scan bones/create image of body's internal structures✓/ *Skandeer bene/skep beeld van die liggaam se interne strukture*
- Detect injuries✓/ *Bespeur beserings*
- To detect tumors✓/ *Om gewasse op te spoor*

(1)

Any correct Answer, ONE MARK/ *Enige korrekte antwoord, EEN PUNT*

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QUESTION 6/*VRAAG 6*

6.1 *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)

6.2 $n = \frac{Q}{qe}$ ✓

$= \frac{-3\times10^{-6}}{-1,6\times10^{-19}}$ ✓

$= 1,875 \times 10^{13}\ electrons/elektrone$ ✓ (3)

6.3

6.3.1 $Q_{new} = \frac{Q_1+Q_2}{2}$ ✓

$-1 \times 10^{-6} = \frac{(-3\times10^{-6}) + Qq}{2}$ ✓

$2(-1 \times 10^{-6}) = -3 \times 10^{-6} + Q_Q$

$Q_Q = 1 \times 10^{-6}C$ ✓ (3)

6.3.2 P to Q ✓ (1)

6.3.3 **OPTION 1/*OPSIE 1***

$n = \frac{\Delta Q}{qe}$ ✓

$n = \frac{Qnew-Qold}{qe}$

$\frac{(-1\times10^{-6})-(-3\times10^{-6})}{1,6\times10^{-19}}$ ✓

$= 1,25 \times 10^{13}\ electrons/elektrone$ ✓

OPTION 2/*OPSIE 2*

$n = \frac{\Delta Q}{qe}$ ✓

$n = \frac{Qnew-Qold}{qe}$

$\frac{(-1\times10^{-6})-(1\times10^{-6})}{1,6\times10^{-19}}$ ✓

$= 1,25 \times 10^{13}\ electrons/elektrone$ ✓

(4)

6.4 The charges on spheres will leak away into the ground. ✓/ *Die ladings op sfere sal in die grond weglek*

OR/*OF*

Spheres will lose a charge and become neutral. ✓/ *Sfere sal 'n lading verloor en neutraal word* (1)

[14]

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QUESTION 7/*VRAAG 7*

7.1 Current- Rate of flow of charge. ✓✓/ *Stroom - Tempo van vloei van lading* (2)

7.2 Combination of series and parallel circuit. ✓/ *Kombinasie van serie- en parallelstroombane* (1)

7.3 **OPTION 1/*OPSIE 1***

$\frac{1}{Rp} = \frac{1}{R1} + \frac{1}{R2}$ ✓

$\frac{1}{Rp} = \frac{1}{4} + \frac{1}{8}$ ✓

$\frac{1}{Rp} = \frac{3}{8}$

$Rp = \frac{8}{3}$

$Rp = 2,67\ \Omega$

$R_T = R_S + R_P$
$= 2 + 2,67$✓
$= 4,67\ \Omega$ ✓

OPTION 2/*OPSIE 2*

$R_P = \frac{R_1 R_2}{R_1 + R_2}$ ✓
$= \frac{4 \times 8}{4 \times 8}$ ✓
$= 2,67\Omega$

(4)

7.4 Smaller than/*Kleiner as*, ✓
$R_T = R_1 + R_2 + R_3$
$= 2 + 4 + 8$✓
$= 14\ \Omega$

$V = IR$ ✓
$14 = 1(14)$
$I = 1\ A$ ✓

(4)

7.5 $I = \frac{Q}{\Delta t}$ ✓

$2 = \frac{Q}{3 \times 60}$ ✓

$Q = 2 \times 3 \times 60$
$Q = 360\ C$ ✓

(3)

7.6 Circuit 2 ✓/*Stroombaan 2*
- Circuit 2 has lower resistance allowing a battery to supply more current. ✓/ *Stroombaan 2 het laer weerstand wat 'n battery toelaat om meer stroom te lewer* (2)

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TOTAL/*TOTAAL*: [100]

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