LIMPOPO
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DEPARTMENT OF
EDUCATION

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NATIONAL SENIOR CERTIFICATE

GRADE/GRAAD 10

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

ERRATA MARKING GUIDELINES/*ERRATA NASIENRIGLYNE*

JUNE 2025/*JUNIE 2025*

13 JUNE 2025

MARKS/*PUNTE*: 100

These MARKING GUIDELINES consists of 12 pages including the cover page/*Hierdie NASIENRIGLYNE bestaan uit 12 bladsye, die voorblad ingesluit.*

QUESTION 1/*VRAAG 1*

1.1 B✓✓ (2)

1.2 A ✓✓ (2)

1.3 B✓✓ (2)

1.4 D✓✓ (2)

1.5 B✓✓ (2)

1.6 A✓✓ (2)

1.7 D✓✓ (2)

1.8 C✓✓ (2)



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QUESTION 2/*VRAAG 2*

2.1 Destructive interference✓/ *Destruktiewe interferensie* (1)

2.2 Principle of superposition of pulses✓/ *Beginsel van superposisie van pulse* (1)

2.3.1 Amplitude is the maximum disturbance of a particle from its rest (equilibrium) position. ✓✓/ *Amplitude is die maksimum versteuring van 'n deeltjie vanaf sy rusposisie (ewewigsposisie).* **(2 or/*of* 0)** (2)

2.3.2 Amplitude(X) = 8 + (-6) ✓

= 2 cm✓

= 0,02 m✓ (3)

[07]

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QUESTION 3/*VRAAG 3*

3.1.1 $20\lambda = 0{,}240$

$\lambda = \frac{0.240}{20}$ ✓ (Any one/*enige een*)

$= 0.012$ m ✓ (2)

3.1.2 **Positive marking from question 3.1.1/*Positiewe nasien vanaf vraag 3.1.1***

$v = \frac{d}{\Delta t}$

$= \frac{1{,}260}{3}$✓

$= 0.42$ m.s^{-1}✓

$v = f\lambda$✓

$v = \frac{\lambda}{T}$

$0{,}42 = \frac{0{,}012}{T}$✓

T = 0.029 s✓ (5)

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3.2.1 Transverse wave is a wave in which the particles of the medium vibrate at right angles to the direction of motion of the wave. ✓✓/ *'n Transversale golf is 'n golf waarin die deeltjies van die medium reghoekig met die bewegingsrigting van die golf vibreer.* **(2 or/*of* 0)**

Accept: A transverse wave is a succession of transverse pulses / ***Aanvaar:*** *'n Transversale golf is 'n opeenvolging van transversale pulse*

(2)

3.2.2 B – Wavelength✓/*B – Golflengte*

C – Crest ✓/*C – Kruin* (2)

3.2.3 $T = \frac{1}{f}$

$= \frac{1}{30}$✓

= 0,033 s✓ (2)

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3.2.4 No, ✓ because two points in phase are separated by a complete number of wavelengths. ✓/ *Nee, omdat twee punte in fase deur 'n volledige aantal golflengtes geskei word.*

OR/*OF*

They are not separated by wavelength. ✓/ *Hulle word nie deur golflengte geskei nie*

(2)

3.2.5 v = f λ✓

v = 30 × 4 ✓

= 120 m·s^{-1} ✓

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(3)

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QUESTION 4/*VRAAG 4*

4.1 Longitudinal wave✓/ *Longitudinale golf* (1)

4.2.1 P – Compression ✓/*P - Verdigting* (1)

4.2.2 Q – Wavelength ✓/ *Q - Golflengte* (1)

4.3 $v = f\lambda$✓

$\underline{1480 = f \times 0{,}05}$✓

$f = 29600$ Hz✓

It cannot be heard since it is greater than 20KHz✓/ *Dit kan nie gehoor word nie, aangesien dit groter as 20 kHz is.* (4)

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4.4

OPTION 1/*OPSIE 1*	**OPTION 2/*OPSIE 2***
The distance covered in/ *Die afstand afgelê in* $3s = (2x - 300)m$ ✓ $v = \frac{d}{\Delta t}$✓ 340✓ $= \frac{2x-300}{3}$✓ $x = 660\ m$ Distance/*afstand* = 660 – 300✓ = 360 m Note: If only the answer of 360 m is given without calculations (660 – 300), still award 1 mark./*As slegs die antwoord van 360 m gegee is, sonder bewerkings (660 – 300), gee nogsteeds 1 punt*	Δt for sound to travel from position 1 to position 2/Δt *vir klank om van posisie 1 na posisie 2 te beweeg*. $v = \frac{d}{\Delta t}$✓ 340✓ $= \frac{300}{\Delta t}$ $\Delta t = 0{,}8823529412\ s$ ✓ Δt for sound to travel from position 2 to obstacle/Δt *vir klank om van posisie 2 na hindernis te beweeg* $= \frac{3-0{,}8823529412}{2}$✓ $= 1{,}058823529s$ Distance/*afstand* = $v\Delta t$ $= 340 \times 1{,}058823529$✓ = 360 m (Do not penalise if a learner round of Δt to minimum of two decimals./*Moenie penaliseer as 'n leerder* Δ*t tot 'n minimum van twee desimale afrond nie.)*

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OPTION 3/*OPSIE 3*

Distance covered/ *Afstand afgelê*
= (300 + 2d✓)✓

$v = \frac{d}{\Delta t}$✓

340✓ $= \frac{300+2}{3}$✓

$d = 360\ m$

(5)

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QUESTION 5/*VRAAG 5*

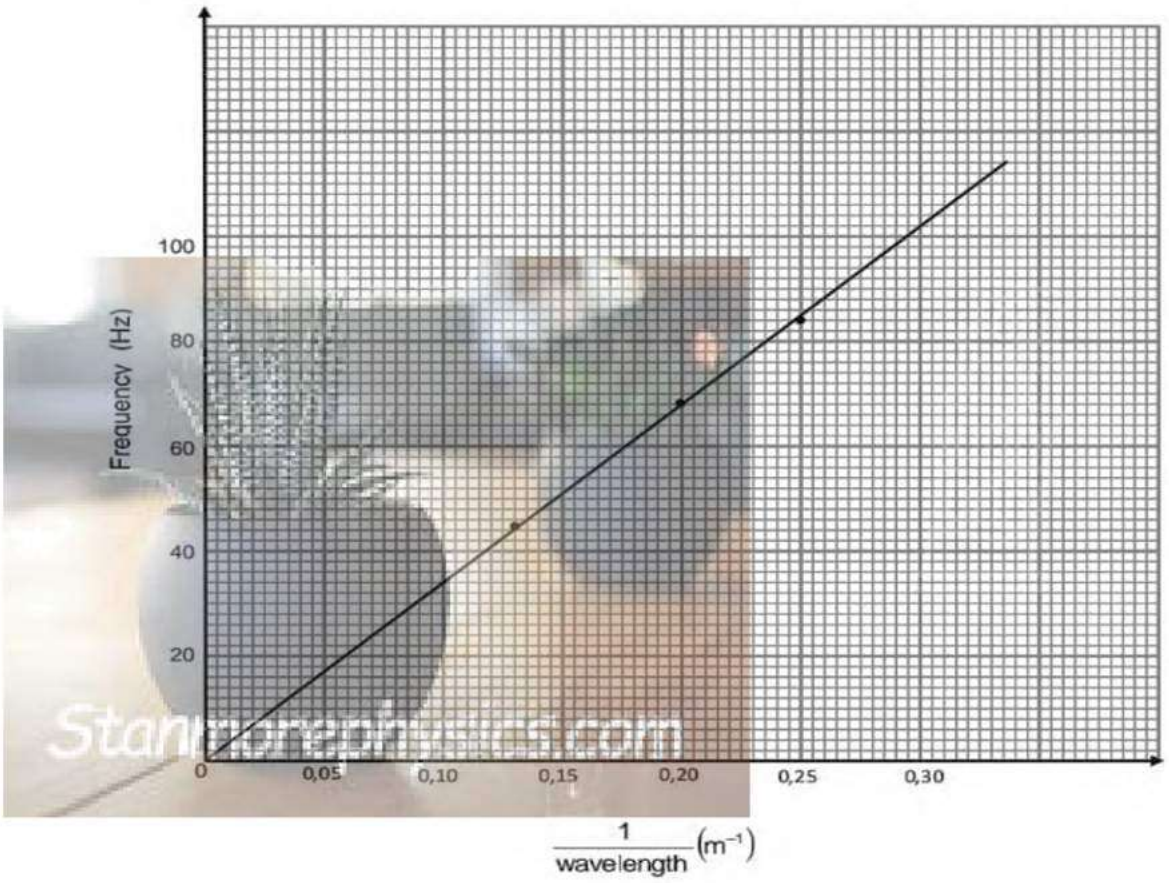
5.1 What is the relationship between the wavelength and frequency of different soun notes? ✓✓/ *Wat is die verband tussen die golflengte en frekwensie van verskillende klanknote?*
OR/*OF*
How does an increase in frequency affect wavelength? ✓✓/ *Hoe beïnvloed 'n toename in frekwensie die golflengte?* (2)

5.2 Temperature ✓ (of the surrounding air) Accept: Instrument/*Temperatuur (van die omliggende omgewing)Aanvaar: Instrument* (1)

5.3

Marking criteria/nasien kriteria :	
Plotting all 3 points correctly/*plot al 3 punte korrek*	✓✓
Plotting two points correctly/*plot twee punte korrek*	✓
Straight line graph passing through the origin/*reguitlyn deur die oorsprong*	✓

(3)



5.4 Frequency is inversely proportional to wavelength✓/ *Frekwensie is omgekeerd eweredig aan golflengte*

OR/*OF*

Frequency is directly proportional to inverse of wavelength. ✓/ *Frekwensie is direk eweredig aan die inverse van die golflengte*

OR/*OF*

As the frequency increases, the wavelength decreases. ✓/ *Soos die frekwensie toeneem, neem die golflengte af* (1)

5.5 $gradient = \frac{84 - 44\checkmark}{0{,}25 - 0{,}13\checkmark}$

= 333,33✓

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OR/*OF*

Any other suitable co-ordinates/ *Enige ander geskikte koördinate* (3)

5.6 Speed ✓ (of sound)/*Spoed (van klank)* (1)

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QUESTION 6/*VRAAG 6*

6.1 **ANY ONE/*ENIGE EEN***

- Wave-particle duality ✓/ *Dubbele aard van deeltjies*
- No need for a medium to propagate✓/ *Geen medium nodig om voort te plant nie*
- Speed of EM waves are constant at 3 x 10^8m.s^{-1} in a vacuum✓/ *Die spoed van elektromagnetiese golwe is konstant teen 3 x 10^8 m.s^{-1} in 'n vakuum.*
- Oscillation between alternating accelerating charges cause magnetic waves✓/ *Ossillasie tussen afwisselende versnellende ladings veroorsaak magnetiese golwe*

(1)

6.2 Originate from an accelerating electric charge. ✓✓/ *Ontstaan uit 'n versnellende elektriese lading.*

(2)

6.3.1 Infrared radiation✓/*Infrarooi radiasie/straling* (1)

6.3.2 Visible light✓/*Sigbare lig* (1)

6.4 $E = \frac{hc}{\lambda}$✓

$6{,}63 \times 10^{-19}$ ✓ $= \frac{6{,}63\times10^{-34}\times3\times10^{8}}{\lambda}$✓

$\lambda = 3{,}00 \times 10^{-7}$ m✓

∴ Ultraviolet light✓/*Ultraviolet lig* (5)

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QUESTION 7/*VRAAG 7*

7.1 $Q = nq_e$ ✓

$= 2 \times 10^{13} \times (-1{,}6 \times 10^{-19})$ ✓

$= -3{,}2 \times 10^{-6}$ C✓ (3)

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)

7.3.1 **POSITIVE MARKING FROM QUESTION 7.1/POSITIEWE NASIEN VANAF VRAAG 7.1**

$Q_f = \frac{Q_1+Q_2}{2}$✓

$6{,}4 \times 10^{-6}$✓ $= \frac{-3{,}2\times10^{-6}+Q_2}{2}$✓

$Q_2 = 1{,}6 \times 10^{-5}C$✓ (4)

7.3.2 ***POSITIVE MARKING FROM QUESTION 7.3.1/POSITIEWE NASIEN VANAF VRAAG 7.3.1***

OPTION 1/*OPSIE1*

$\Delta Q = nq_e$✓

$\underline{6{,}4 \times 10^{-6} - 1{,}6 \times 10^{-5} = n \times (-1{,}6 \times 10^{-19})}$ ✓

$n = 6 \times 10^{13}\ electrons$✓

OPTION 2/*OPSIE 2*

$\Delta Q = nq_e$✓

$\underline{6{,}4 \times 10^{-6} - (-3{,}2 \times 10^{-6}) = n \times 1{,}6 \times 10^{-19}}$✓

$n = 6 \times 10^{13}\ electrons/elektrone$✓ (3)

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QUESTION 8/*VRAAG 8*

8.1 Emf is the work done per unit charge by the source (battery). ✓✓/ *Emk is die werk wat per eenheidslading deur die bron (battery) verrig word.* (2)

8.2 $V_1 = \frac{W}{Q}$✓

$= \frac{3\times10^4}{2{,}5\times10^3}$✓

= 12 V✓ (3)

8.3 $I_1 = \frac{Q}{\Delta t}$✓

$= \frac{3{,}24}{2}$✓

= 1,62 A✓ (3)

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8.4 **POSITIVE MARKING FROM QUESTION 8.3/POSITIEWE NASIEN VANAF VRAAG 8.3**

A_3 = 1,62 – 0,65

= 0,97 A✓ (1)

8.5 **OPTION 1/*OPSIE 1***

$\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2}$ ✓

$= \frac{1}{6} + \frac{1}{4}$ ✓

$\therefore R_p = 2.40\ \Omega$

$R_t = R_p + R_R$

$7{,}40 = 2{,}40 + R_R$✓

$R_R = 5\ \Omega$ ✓

Carry over mark in multi-step question. Award the mark for substitution of R_p, even if wrongly calculated. BUT then the (wrong) answer of R_R is not marked. / *Oordrag punt in multi-stap vraag. Gee die punt vir die substitusie van Rp, al is dit verkeerdelik uitgewerk, MAAR dan word die (verkeerde) antwoord van RR nie gemerk nie.*

OPTION 2/*OPSIE 2 (*POSITIVE MARKING FROM QUESTION 8.3/*POSITIEWE NASIEN VANAF VRAAG 8.3)*

$V_1 = 12$ V

$V_2 = 0,65 \times 6$

$= 3,9$ V

$V_R = 12 - 3,9$✓

$= 8,1$ V

$R = \frac{V}{I}$✓

$= \frac{8,1}{1,62}$✓

$= 5\ \Omega$ ✓



(4)

8.6 $V_2 = 0$ V✓/zero (1)

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TOTAL/*TOTAAL* = 100

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