



# education

Department:  
Education  
North West Provincial Government  
**REPUBLIC OF SOUTH AFRICA**

## **NATIONAL SENIOR CERTIFICATE NASIONALE SENIOR SERTIFIKAAT**

**GRADE/GRAAD 12**

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

**SEPTEMBER 2023**

**MARKING GUIDELINES/NASIENRIGLYNE**

**MARKS/PUNTE: 150**

**These marking guidelines consist of 13 pages and a cognitive table/  
Hierdie nasienriglyne bestaan uit 13 bladsye en 'n kognitiewe tabel.**



**QUESTION 1/VRAAG 1**

1.1	B	✓✓	(2)
1.2	C	✓✓	(2)
1.3	C	✓✓	(2)
1.4	D	✓✓	(2)
1.5	A	✓✓	(2)
1.6	B	✓✓	(2)
1.7	C	✓✓	(2)
1.8	D	✓✓	(2)
1.9	C	✓✓	(2)
1.10	C	✓✓	(2)
			<b>[20]</b>



## QUESTION 2/VRAAG 2

2.1.1

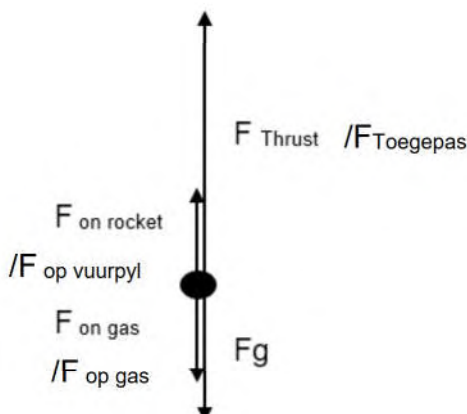
$F_s = \mu_s F_g$ $F_s = \mu_s N$ $= (0,6)(400)(9,8) \checkmark$ $F_s = 2352 \text{ N} \checkmark$	any one ✓	(3)
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2.1.2

<b>OPTION 1/OPSIE 1</b>	<b>OPTION 2/OPSIE 2</b>	(2)
$F_f = \mu_k F_g$ $= \mu_k N$ $= (0,4)(400)(9,8) \checkmark$ $= 1568 \text{ N} \checkmark$	$F_{\text{net}} = ma$ $F_A - f_k = 400 \times 0$ $F_A - 0,4 \times 400 \times 9,8 = 0 \checkmark$ $F_A = 1568 \text{ N} \checkmark$	

2.2.1 When object A exerts a force on object B, object B simultaneously exerts an oppositely directed force of equal magnitude on object A. ✓✓  
*Wanneer voorwerp A 'n krag op voorwerp B uitoefen, sal voorwerp B gelyktydig 'n krag van gelyke grootte en in die teenoorgestelde rigting op voorwerp A uitoefen.* (2)

2.2.2



$F_{\text{Thrust}}/F_{\text{Applied by gas}}/F_{\text{Toegepas}}$	✓
$F_g/mg/\text{weight}/\text{gravitational force}/w/\text{gravitasiekrag}$	✓
$F_{\text{on rocket}}/F_{\text{op vuurpyl}}$	
$F_{\text{on gas}}/F_{\text{op gas}}$	

Accept any of the 2 forces/Aanvaar enige 2 kragte (2)

2.2.3

$v_f = v_i + a\Delta t \checkmark$ $40 = 0 + (a)(1,6) \checkmark$ $a = 25 \text{ m} \cdot \text{s}^{-2}$ $F_{\text{Total}}/Totaal = w + ma$ $= (20\,000)(9,8) + (20\,000)(25) \checkmark$ $= 696\,000 \text{ N} \checkmark$	(4)
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2.2.4

$F_{\text{net}} = ma - w$ $= (80)(25) - (80)(9,8) \checkmark$ $= 1216 \text{ N} \checkmark$	(2)
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[15]

**QUESTION 3/VRAAG 3**

- 3.1 Motion during which the only force acting on an object is the force of gravity. ✓✓  
*Beweging waar die enigste krag wat op die voorwerp inwerk gravitasiekrag is. (2 or/of 0)* (2)

- 3.2 It has an initial velocity as it is rising with the helicopter. ✓  
*Dit het 'n aanvanklike snelheid soos dit saam met die helikopter opwaarts beweeg.*

**OR/OF**

Package has same initial velocity of that of the helicopter. ✓  
*Dit het 'n aanvanklike snelheid dieselfde as die helikopter.*

**Accept explanation based on Newton's first law**

***Aanvaar verduideliking gebaseer op Newton se eerste wet*** (1)

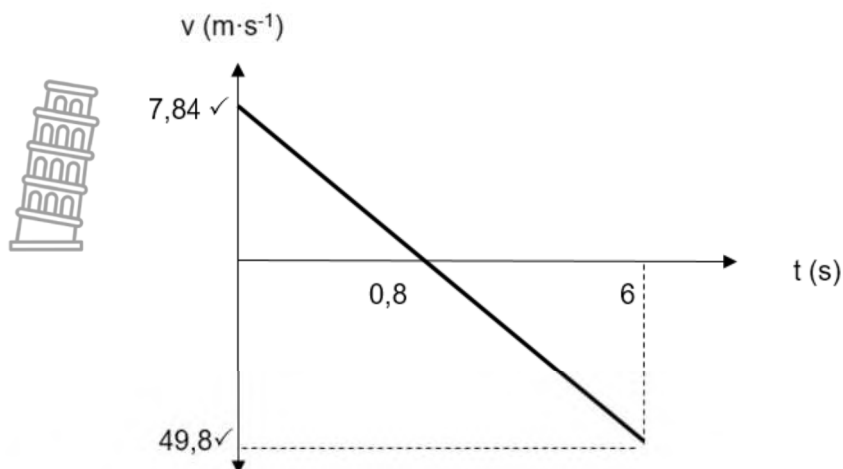
- 3.3 Consider upward motion of the package/*Beskou opwaartse beweging van die pakkie:*  
 $v_f = v_i + a\Delta t$  ✓  
 $0 = v_i + (-9,8)(0,8)$  ✓  
 $v_i = 7,84 \text{ m}\cdot\text{s}^{-1}$  upwards/*opwaarts* ✓  
Initial velocity of the package is same as the velocity of helicopter.  
*Die aanvanklike snelheid van die pakkie is dieselfde as die snelheid van die helikopter.* (3)

- 3.4  $v_f^2 = v_i^2 + 2a\Delta y$  ✓  
 $(-49,8)^2 = (7,84)^2 + (2)(-9,8) \Delta y$  ✓  
 $\Delta y = -123,4 \text{ m}$   
 $= 123,4 \text{ m above the ground/bo die grond}$  ✓ (3)





3.5 **POSITIVE MARKING FROM QUESTION 3.3**  
**POSITIEWE NASIEN VANAF 3.3**



**Marking criteria/Nasienkriteria**

Labelling/Benoem 7,84 and/en 49,8 on the graph/op die grafiek ✓✓

Labelling/Benoem 0,8 s and/en 6 s on the graph/op die grafiek ✓

(3)

- 3.6 Height reached = area under the graph/  
*Hoogte = oppervlak onder die grafiek*  
 Height/Hoogte =  $\frac{1}{2}bh$   
 $= \frac{1}{2}(0,8)(7,84)$  ✓  
 $= 3,14 \text{ m}$  ✓

(2)

- 3.7  $\Delta y = v_i \Delta t$   
 $= (7,84)(6)$  ✓  
 $= 47,04 \text{ m}$  ✓

(2)

[16]

**QUESTION 4/VRAAG 4**

- 4.1 The total linear momentum of a closed system remains constant  
 (is conserved). ✓✓

(2)

*Die totale lineêre momentum in 'n geslote sisteem bly konstant.*

**(2 or/of 0)**

- 4.2  $\Sigma p_{\text{before/voor}} = \Sigma p_{\text{after/na}}$   
 $m_1 v_i + m_2 v_i = m_1 v_f + m_2 v_f$  } any one/enige een ✓  
 $0 \checkmark = (0,5)(-2,4) + (0,3)(v_f)$  ✓  
 $v_f = 4 \text{ m} \cdot \text{s}^{-1}$  towards right/na regs ✓

(3)



4.3

**Marking criteria/Nasienkriteria**

Formula ✓

Substitution to calculate  $F_{\text{net}}$  ✓

Final answer ✓

**OPTION 1/OPSIE 1**

$$\left. \begin{aligned} F_{\text{net}} \Delta t &= \Delta P \\ F_{\text{net}} \Delta t &= m(v_f - v_i) \end{aligned} \right\} \begin{array}{l} \text{any one } \checkmark \\ \text{enige een} \end{array}$$

$$F_{\text{net}} = \frac{(0,5)(-2,4) - (0,5)(0)}{0,12} \checkmark$$

$$F_{\text{net}} = -10 \text{ N } \checkmark$$

= 10 N against the trolley/  
teen die trollie

**OPTION 2/OPSIE 2**

$$\left. \begin{aligned} F_{\text{net}} \Delta t &= \Delta P \\ F_{\text{net}} \Delta t &= m(v_f - v_i) \end{aligned} \right\} \begin{array}{l} \text{any one } \checkmark \\ \text{enige een} \end{array}$$

$$F_{\text{net}} = \frac{(0,3)(4) - (0,3)(0)}{0,12} \checkmark$$

$$F_{\text{net}} = 10 \text{ N against the trolley/} \\ \text{teen die trollie } \checkmark$$

(3)

4.4

Decreases/Afneem ✓

Acceleration is inversely proportional to the mass/Versnelling is omgekeer eweredig aan die massa ✓

$$a \propto \frac{1}{m}$$

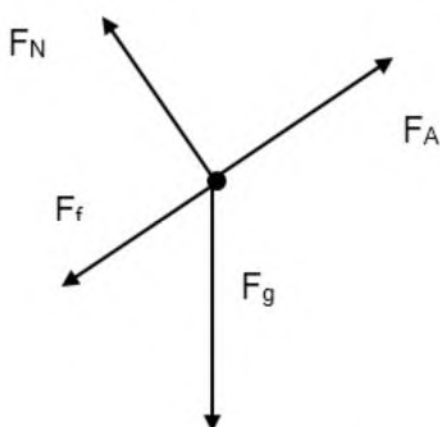
(2)

[10]

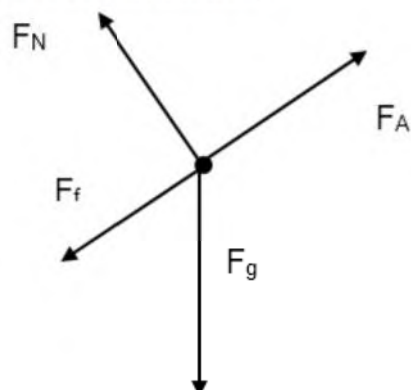
**QUESTION 5/VRAAG 5**

5.1

**OPTION 1/OPSIE 1**



**OPTION 2/OPSIE 2**



**Accepted labels/Aanvaarde benoemings**

N ✓	$F_N$ /Normal/Normal force Normaal /Normaalkrag
F ✓	$F_A$ /Applied force force $F_A$ /Toegepaste krag
$F_f / f$ ✓	Force of friction/Wrywingskrag
w ✓ OR/OF $F_{g\parallel}$ and/en $F_{g\perp}$	$F_g$ /mg/weight/ gravitational force $F_g$ /mg/gewig/ gravitasiekrag

(4)



5.2.1  $W_{Ff} = F_f \Delta x \cos\theta \checkmark$   
 $W_{Ff} = (55)(50) (\cos 180^\circ) \checkmark$   
 $= -2750 \text{ J} \checkmark$  (3)

5.2.2  $F_{g\parallel} = mg \sin\theta$   
 $= (70)(9,8)(\sin 30^\circ) \checkmark$   
 $= 343 \text{ N}$   
 $W_{g\parallel} = F_{g\parallel} \Delta x \cos\theta$   
 $= (343)(50)(\cos 180^\circ) \checkmark$   
 $= -17150 \text{ J} \checkmark$  (3)

5.2.3 **POSITIVE MARKING FROM QUESTION 5.2.1 and 5.2.2**  
**POSITIEWE NASIEN VANAF 5.2.1 and 5.2.2**

OPTION 1/OPSIE 1	OPTION 2/OPSIE 2
$W_{\text{net}} = W_{F_{\text{app}}} + W_{Ff} + W_{F_{g\parallel}} \checkmark$ $0 \checkmark = W_{F_{\text{app}}} - 2750 - 17150 \checkmark$ $W_{F_{\text{app}}} = 19900 \text{ J} \checkmark$	$W_{FA} = F_A \Delta x \cos\theta \checkmark$ $= (70 \times 9,8 \times \sin 30^\circ + 55) \checkmark (50)(\cos 0^\circ) \checkmark$ $= 19900 \text{ J} \checkmark$

(4)

5.3 **POSITIVE MARKING FROM QUESTION 5.2.3**  
**POSITIEWE NASIEN VANAF 5.2.3**

OPTION 1/OPSIE 1	OPTION 2/OPSIE 2
$W_{F_{\text{app}}} = F_{\text{app}} \Delta x \cos\theta$ $19900 = F_{\text{app}} \times 50 \times \cos 0^\circ \checkmark$ $F_{\text{app}} = 398 \text{ N} \checkmark$	$F_{\text{app}} = F_f + F_{g\parallel}$ $F_{\text{app}} = 55 + 343 \checkmark$ $F_{\text{app}} = 398 \text{ N} \checkmark$
<b>OPTION 3/OPSIE 3</b> $F_{\text{net}} = ma$ $F_A - (F_{g\parallel} + f) = ma$ $F_A = (70 \times 9,8 \times \sin 30^\circ) + 55 \checkmark$ $= 398 \text{ N} \checkmark$	

(2)

[16]

## QUESTION 6/VRAAG 6

6.1.1 The change in frequency (or pitch) ✓ of the sound detected by a listener because the sound source and the listener have different velocities relative to the medium of sound propagation. ✓ / Die verandering in die frekwensie (toonhoogte) van die waargenome klank deur die luisteraar agv die klankbron en die luisteraar wat verskillende snelhede relatief tot mekaar het.  
**OR/OF**  
 An (apparent) change in (observed/detected) frequency (pitch), ✓ as a result of the relative motion between a source and an observer ✓ (listener).  
 'n (Skynbare) verandering in (waargenome) frekwensie (toonhoogte), as gevolg van die relatiewe beweging tussen die bron en 'n waarnemer/luisteraar. (2)

6.1.2 Doppler flow meter/Doppler vloeimeter ✓ (1)

6.1.3 Less than/Minder as 800 Hz. ✓

As the police car moves away, fewer waves arriving per second ✓✓ and  
lesser the frequency/Soos die polisiemotor weg beweeg, verminder die  
golwe per sekonde en verminder die frekwensie

OR/OF

wavelength is inversely proportional to the frequency  
golflengte is omgekeerd eweredig aan die frekwensie

(3)

6.1.4 **Marking criteria/Nasienkriteria**

Formula to calculate  $f_L$  ✓

Substitution of (340-0) ✓

Substitution of (800) ✓

Final answer ✓

$$f_L = \frac{v \pm v_L}{v \pm v_s} f_s \quad \checkmark$$

$$v_s = 100 \text{ km} \cdot \text{h}^{-1}$$

$$v_s = 27,78 \text{ m} \cdot \text{s}^{-1}$$

$$f_L = \frac{(340-0) \checkmark}{(340+27,78)} (800) \checkmark$$

$$f_L = 739,57 \text{ Hz} \checkmark$$

(4)

6.2 Galaxy/Sterrestelsel B ✓

The more distant the galaxy is, ✓ the greater the speed at which it is  
moving. ✓

Hoe verder weg die sterrestelsel is, hoe groter is die spoed waarteen dit  
beweeg.

(3)

[13]



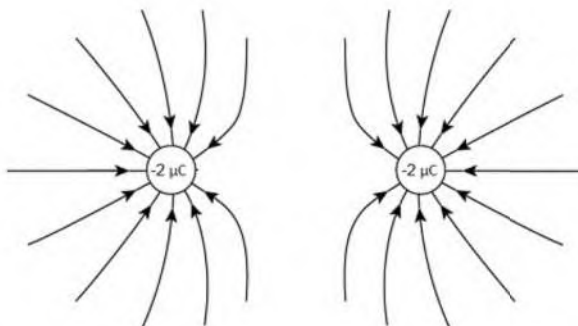


### QUESTION 7/VRAAG 7

7.1 Electrostatic force/*Elektrostatiese krag* ✓ (2)  
They repel each other/*stoot mekaar weg* ✓

7.2 By friction/*deur wrywing* ✓ (1)

7.3



#### Marking criteria/Nasienkriteria

Shape/*Vorm* ✓

Correct direction/*Korrekte rigting* ✓

(2)

7.4

$$F = \frac{kQ_1Q_2}{r^2} \quad \checkmark$$

$$6,48 \times 10^{-3} \checkmark = \frac{(9 \times 10^9)(6 \times 10^{-9})(3 \times 10^{-9})}{(r)^2} \quad \checkmark$$

$$r = 0,005 \text{ m} \checkmark / 5 \times 10^{-3} \text{ m}$$

(4)

7.5

#### Marking criteria/Nasienkriteria

Formula to calculate  $E$ /*Formule om  $E$  te bereken* ✓

Correct substitution to calculate  $E_{6nC}$ /*Korrekte vervanging om  $E_{6nC}$  te bereken* ✓

Correct substitution to calculate  $E_{3nC}$ /*Korrekte vervanging om  $E_{3nC}$  te bereken* ✓

Vector addition (subtraction) to calculate  $E_{net}$ /*Vektor addisie (aftrekking) om  $E_{net}$  te bereken* ✓

Final answer/*Finale antwoord* ✓

#### **POSITIVE MARKING FROM QUESTION 7.4**

#### **POSITIEWE NASIEN VAN VRAAG 7.4**

$$E = \frac{kQ}{r^2} \quad \checkmark$$

$$E_{6nC} = \frac{(9 \times 10^9)(6 \times 10^{-9})}{(2,5 \times 10^{-3})^2} \quad \checkmark$$

$$= 8,64 \times 10^6 \text{ N} \cdot \text{C}^{-1} \text{ to the left/na links}$$

$$E_{3nC} = \frac{(9 \times 10^9)(3 \times 10^{-9})}{(2,5 \times 10^{-3})^2} \quad \checkmark$$

$$= 4,32 \times 10^6 \text{ N} \cdot \text{C}^{-1} \text{ to the right/na regs}$$

$$E_{net} = (8,64 \times 10^6) - (4,32 \times 10^6) \quad \checkmark$$

$$= 4,32 \times 10^6 \text{ N} \cdot \text{C}^{-1} \text{ to the left/na links} \quad \checkmark$$



(5)

[14]

### QUESTION 8/VRAAG 8

8.1.1 18 V ✓ (1)

8.1.2 0 A ✓ (1)

8.2.1 When the charges moves through the battery, some of the energy is lost ✓  
in the form of heat due to internal resistance. ✓ Therefore there is less  
potential difference available to the charges. ✓  
*Soos wat ladings deur die battery beweeg, sal van die energie verlore gaan*  
*in die vorm van hitte a.g.v. interne weerstand. Daarom is daar minder*  
*potensiaalverskil bekikbaar vir die ladings.* (3)

8.2.2  $V_{\text{lost/verlore}} = I_r$  ✓  
 $0,72 = 7,2 r$  ✓  
 $r = 0,1 \Omega$  ✓ (3)

8.2.3 **POSITIVE MARKING FROM QUESTION 8.1.1 and 8.2.2**  
**POSITIEWE NASIEN VAN VRAAG 8.1.1 EN 8.2.2**  
 $\text{emf } (\mathcal{E}) = I(R + r)$  ✓  
 $18 \checkmark = 7,2 (R_T + 0,1)$  ✓  
 $R_T = 2,4 \Omega$   
 $\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2} + \dots$   
 $\frac{1}{2,4} = \frac{1}{6} + \frac{1}{R}$  ✓  
 $R = 4 \Omega$  ✓ (5)

8.3 Decreases/Afneem ✓  
There are fewer bulbs in parallel. Total resistance of the external circuit  
increases and total current decreases. ✓ Decrease in current results in a  
decrease in the power. ✓  
*Daar is minder gloeilampe in parallel. Totale weerstand van die eksterne*  
*stroombaan verhoog en totale stroom(sterkte) neem af. Afname in*  
*stroom(sterkte) lei tot 'n afname in drywing.* (3)  
**[16]**





## QUESTION 9/VRAAG 9

- 9.1 A current carrying conductor will experience a force, ✓ when placed in a magnetic field. ✓

**Accept:** Fleming's left hand motor rule.

*'n Stroomdraende geleier sal 'n krag ervaar wanneer dit in 'n magnetiese veld geplaas word.*

**Aanvaar:** Fleming se linkerhand motorreël

(2)

- 9.2 Direct current motor/Gelykstroom motor ✓

(1)

- 9.3 Split ring commutator/Split ring kommutator ✓

(1)

- 9.4 A to B/A na B ✓

(1)

9.5.1 
$$T = \frac{1}{50}$$
  
$$= 0,02 \text{ s} \checkmark$$

(1)

9.5.2 
$$I_{\text{rms}} = \frac{I_{\text{max}}}{\sqrt{2}} \checkmark$$
  
$$= \frac{10,6}{\sqrt{2}} \checkmark$$
  
$$I_{\text{rms}} = 7,5 \text{ A} \checkmark$$

(3)

- 9.5.3 **POSITIVE MARKING FROM QUESTION 9.5.2**  
**POSITIEWE MERK VAN VRAAG 9.5.2**  
**OPTION 1/OPSIE 1**

$$P_{\text{ave}} = I_{\text{rms}}^2 \times R \checkmark$$
  
$$1800 \checkmark = 7,5^2 \times R \checkmark$$
  
$$R = 32 \Omega \checkmark$$

- POSITIVE MARKING FROM QUESTION 9.5.2**  
**POSITIEWE MERK VAN VRAAG 9.5.2**  
**OPTION 2/OPSIE 2**

$$P_{\text{ave}} = \frac{V_{\text{rms}}^2}{R} \checkmark$$
  
$$1800 \checkmark = \frac{240^2}{R} \checkmark$$
  
$$R = 32 \Omega \checkmark$$

(4)

- 9.6.1 Use stronger magnets/Gebruik sterker magnete ✓  
Use a higher voltage battery/Gebruik 'n battery met hoër potensiaalverskil ✓  
Increase number of turns of the armature (coil)./Verhoog die aantal draaie(windings) van die spoel.

**Any two/enige twee**

(2)

- 9.6.2 Rotate poles of the magnet ✓ **OR** change the poles of the battery ✓  
Roteer die pole van die magneet **OF** verander die pole van die battery

(2)

**[17]**



**QUESTION 10/VRAAG 10**

10.1 Light energy converts to electrical energy/*Lig energie omgeskakel in elektriese energie* ✓✓ (2)

10.2 To determine which wavelengths of light are suitable for use in a solar cell ✓✓  
*Om te bepaal watter golflengtes lig geskik sal wees vir 'n sonsel* (2)

10.3

**OPTION 1/ OPSIE 1**

**Marking criteria/Nasienkriteria**

Any of the formula/*Enige formule* ✓

Correct substitution to calculate E for blue light/*Korrekte substitusie om E vir die blou lig te bereken* ✓

Correct substitution of kinetic energy/*Korrekte substitusie van kinetiese energie* ✓

Final answer for  $W_0$  /*Finale antwoord vir  $W_0$*  ✓

Correct substitution to calculate E for red light/*Korrekte substitusie om E vir die rooi lig te bereken* ✓

Final answer for E for red light/*Finale antwoord vir E van die rooi lig* ✓

Writing the answer/*Skryf van die antwoord  $E_{\text{red/rooi}} > W_0$*  ✓

$$\left. \begin{aligned} E &= W_0 + E_{k(\text{max})} \\ \frac{hc}{\lambda} &= hf_0 + \frac{1}{2}mv^2 \\ E &= \frac{hc}{\lambda} \end{aligned} \right\} \text{any one/enige een } \checkmark$$

$$W_0 = \frac{(6,63 \times 10^{-34})(3 \times 10^8)}{(460 \times 10^{-9})} - (1,6 \times 10^{-19}) \checkmark$$

$$= 2,72 \times 10^{-19} \text{ J } \checkmark$$

Energy of a red light photon/*Energie van 'n rooilig foton*

$$E = \frac{hc}{\lambda}$$

$$E = \frac{(6,63 \times 10^{-34})(3 \times 10^8)}{(700 \times 10^{-9})} \checkmark$$

$$= 2,84 \times 10^{-19} \text{ J } \checkmark$$

Red light will emit electrons since/*Rooilig sal fotone vrystel want*

$$E_{\text{red/rooi}} > W_0 \checkmark$$



**OPTION 2/ OPSIE 2**

**Marking criteria/Nasienkriteria**

Any of the formula/Enige formule ✓

Correct substitution to calculate E for blue light/Korrekte substitusie om E vir die blou lig te bereken ✓

Correct substitution of kinetic energy/Korrekte substitusie van kinetiese energie ✓

Final answer for  $W_0$ /Finale antwoord vir  $W_0$  ✓

Correct substitution to calculate  $f_0$ /Korrekte substitusie om  $f_0$  te bereken ✓

Correct substitution to calculate f for red light/Korrekte vervanging om f van die rooi lig te bereken. ✓

Writing the answer/Skryf die antwoord  $f > f_0$  ✓

$$\left. \begin{aligned} E &= W_0 + E_{k(\max)} \\ \frac{hc}{\lambda} &= hf_0 + \frac{1}{2}mv^2 \\ E &= \frac{hc}{\lambda} \end{aligned} \right\} \text{any one/enige een } \checkmark$$

$$E = \frac{(6,63 \times 10^{-34})(3 \times 10^8)}{(460 \times 10^{-9})} \checkmark$$

$$= 4,32 \times 10^{-19} \text{ J}$$

$$E = W_0 + E_{k(\max)}$$

$$(4,32 \times 10^{-19}) = W_0 + (1,6 \times 10^{-19}) \checkmark$$

$$W_0 = 2,72 \times 10^{-19} \text{ J } \checkmark$$

$$W_0 = hf_0$$

$$(2,72 \times 10^{-19}) = (6,63 \times 10^{-34}) (f_0) \checkmark$$

$$f_0 = 4,10 \times 10^{14} \text{ Hz}$$

$$f = \frac{c}{\lambda}$$

$$f = \frac{3 \times 10^8}{700 \times 10^{-9}} \checkmark$$

$$= 4,29 \times 10^{14} \text{ Hz } \checkmark$$

Red light will emit electrons since/Rooilig sal fotone vrystel want  $f > f_0$  ✓

(7)

10.4 Yes/Ja ✓

Red light has the longest wavelength in the visible light spectrum. ✓

If red light could emit electrons from the material, all other light colours will emit electrons.

Rooilig het die langste golflengte in die sigbare lig spektrum.

Indien rooilig elektrone vrystel vanuit die materiaal, sal alle ander kleure lig ook elektrone kan vrystel.

(2)

[13]

**TOTAL/TOTAAL: 150**



SUBJECT: PHYSICAL SCIENCES PAPER 1										GRADE 12			
ANALYSIS GRID										SEPTEMBER 2023			
QUESTION	Mark	Cognitive Levels				Topics				TOTAL	Difficulty Levels		
		1	2	3	4	Mechanics ≈ 65 Marks	Waves, Sound & Light ≈ 15 Marks	Electricity & Magnetism ≈ 55 Marks	Matter & Materials ≈ 15 Marks		Easy	Moderate	Difficult
1.1	2	2				2				2	2		
1.2	2		2			2				2	2		
1.3	2			2		2				2			2
1.4	2			2		2				2	2		
1.5	2		2				2			2		2	
1.6	2			2				2		2			2
1.7	2	2						2		2		2	
1.8	2			2				2		2			2
1.9	2		2					2		2	2		
1.10	2	2							2	2	2		
<b>Ques 1</b>	<b>20</b>	<b>6</b>	<b>6</b>	<b>8</b>	<b>0</b>	<b>8</b>	<b>2</b>	<b>8</b>	<b>2</b>	<b>20</b>	<b>10</b>	<b>4</b>	<b>6</b>
2.1.1	3			3		3				3	3		
2.1.2	2		2			2				2		2	
2.2.1	2	2				2				2	2		
2.2.2	2		2			2				2		2	
2.2.3	4			4		4				4			4
2.2.4	2			2		2				2		2	
<b>Ques 2</b>	<b>15</b>	<b>2</b>	<b>4</b>	<b>9</b>	<b>0</b>	<b>15</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>15</b>	<b>5</b>	<b>6</b>	<b>4</b>
3.1	2	2				2				2	2		
3.2	1			1		1				1			1
3.3	3			3		3				3		3	
3.4	3			3		3				3			3
3.5	3				3	3				3			3
3.6	2		2			2				2	2		
3.7	2			2		2				2		2	
<b>Ques 3</b>	<b>16</b>	<b>2</b>	<b>2</b>	<b>9</b>	<b>3</b>	<b>16</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>16</b>	<b>4</b>	<b>5</b>	<b>7</b>
4.1	2	2				2				2	2		
4.2	3		3			3				3		3	
4.3	3			3		3				3			3
4.4	2		2			2				2			2
<b>Ques 4</b>	<b>10</b>	<b>2</b>	<b>5</b>	<b>3</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>2</b>	<b>3</b>	<b>5</b>
5.1	4			4		4				4		4	
5.2.1	3		3			3				3		3	
5.2.2	3		3			3				3		3	
5.2.3	4			4		4				4			4
5.3	2				2	2				2			2
<b>Ques 5</b>	<b>16</b>	<b>0</b>	<b>6</b>	<b>8</b>	<b>2</b>	<b>16</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>16</b>	<b>0</b>	<b>10</b>	<b>6</b>
6.1.1	2	2					2			2	2		
6.1.2	1		1				1			1	1		
6.1.3	3		3				3			3			
6.1.4	4		4				4			4			4
6.2	3			3			3			3		3	
<b>Ques 6</b>	<b>13</b>	<b>2</b>	<b>8</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>13</b>	<b>0</b>	<b>0</b>	<b>13</b>	<b>6</b>	<b>3</b>	<b>4</b>
7.1	2	2						2		2	2		
7.2	1		1					1		1	1		
7.3	2		2					2		2	2		
7.4	4		4					4		4		4	
7.5	5			5				5		5		5	



SUBJECT: PHYSICAL SCIENCES PAPER 1										GRADE 12			
ANALYSIS GRID										SEPTEMBER 2023			
QUESTION	Mark	Cognitive Levels				Topics				TOTAL	Difficulty Levels		
		1	2	3	4	Mechanics = 65 Marks	Waves, Sound & Light = 15 Marks	Electricity & Magnetism = 55 Marks	Matter & Materials = 15 Marks		Easy	Moderate	Difficult
Ques 7	14	2	7	5	0	0	0	14	0	14	5	9	0
8.1.1	1	1						1		1	1		
8.1.2	1	1						1		1	1		
8.2.1	3		3					3		3		3	
8.2.2	3			3				3		3		3	
8.2.3	5		5					5		5			5
8.3	3			3				3		3		3	
Ques 8	16	2	8	6	0	0	0	16	0	16	2	9	5
9.1	2	2						2		2	2		
9.2	1		1					1		1	1		
9.3	1		1					1		1	1		
9.4	1				1			1		1			1
9.5.1	1	1						1		1	1		
9.5.2	3		3					3		3		3	
9.5.3	4			4				4		4		4	
9.6.1	2			2				2		2	2		
9.6.2	2			2				2		2		2	
Ques 9	17	3	5	8	1	0	0	17	0	17	7	9	1
10.1	2	2							2	2	2		
10.2	2		2						2	2	2		
10.3	7				7				7	7			7
10.4	2			2					2	2		2	
Ques 10	13	2	2	2	7	0	0	0	13	13	4	2	7
SUMMARY													
QUES 1	20	6	6	8	0	8	2	8	2	20	10	4	6
QUES 2	15	2	4	9	0	15	0	0	0	15	5	6	4
QUES 3	16	2	2	9	3	16	0	0	0	16	4	5	7
QUES 4	10	2	5	3	0	10	0	0	0	10	2	3	5
QUES 5	16	0	6	8	2	16	0	0	0	16	0	10	6
QUES 6	13	2	8	3	0	0	13	0	0	13	6	3	4
QUES 7	14	2	7	5	0	0	0	14	0	14	5	9	0
QUES 8	16	2	8	6	0	0	0	16	0	16	2	9	5
QUES 9	17	3	5	8	1	0	0	17	0	17	7	9	1
QUES 10	13	2	2	2	7	0	0	0	13	13	4	2	7
Total mark	150	23	53	61	13	65	15	55	15	150	45	60	45
Norm mark	150	22,5	52,5	60	15	65	15	55	15	150	45	60	45
Total %	100	15	35	41	9	100	100	100	100	100	30	40	30
Norm %	100	15	35	40	10					0	30	40	30

