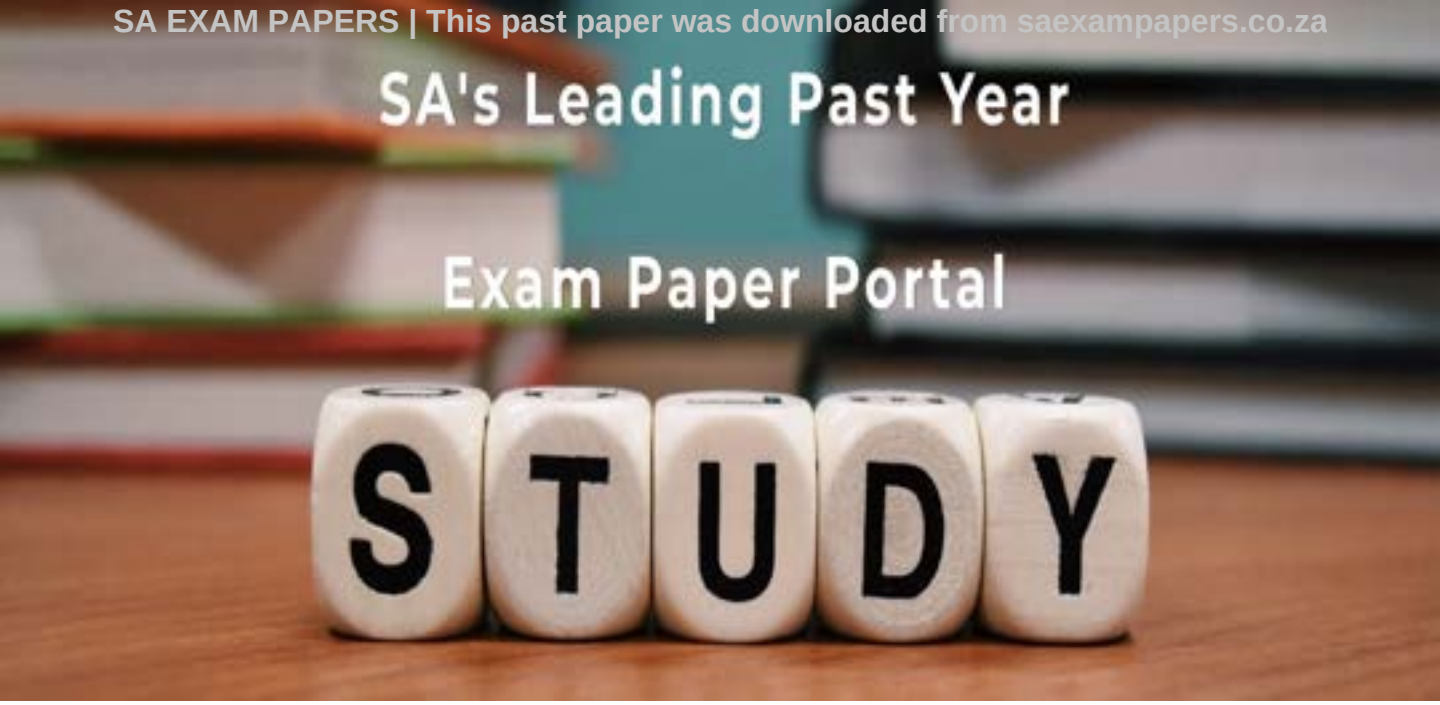


LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF
EDUCATION
VHEMBE EAST DISTRICT

VHEMBE EAST DISTRICT

NATIONAL
SENIOR CERTIFICATE

GRADE 12

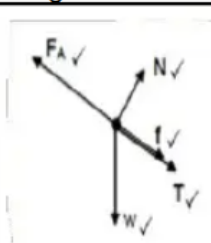
PHYSICAL SCIENCES P1
PRE-JUNE MEMO
19 MAY 2025

MARKS: 150

This Marking Guideline consists of 18 pages including the cover page.

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

QUESTION 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 ✓✓	(2)
2.2		(5)

Accepted labels	
w	F_g / F_w /force of earth on block / weight / mg / gravitational force
N	Normal force/F_N
T	Tension / F_T
F_A	F / $F_{applied}$/40 N
f	Frictional force / F_f

2.3.1	**OPTION 1/*OPSIE 1*** For the 1 kg block/*Vir die 1 kg blok*; $f_k = \mu_k N$ $= \mu_k mg\cos\theta$ ✓ $= 0,29\ (1 \times 9,8 \cos 30°)$ ✓ $= 2,46$ N ✓ **OPTION 2/*OPSIE 2*** BY PROPORTION:/*DEUR EWEREDIGHEID* The smaller mass = ¼ of the larger mass ✓ *Die kleiner massa = ¼ die groter massa* ∴frictional force/*wrywingskrag* = ¼ (10) ✓ = 2,5 N ✓	(3)
2.3.2	$F_{net} = ma$ ✓ For 1 kg block/*Vir 1 kg blok* $F_A - \{(T + f_k) + mg\sin\theta\} = ma$ $40 - \{T + 2,46 + 1(9,8)(\sin 30°)\}$ ✓ $= (1 \times a)$ ✓ $40 - T - 7,36 = a$ $32,64 - T = a$.....(1) For 4 kg block/*Vir 4 kg blok* $T - (mg\sin\theta + f_k) = 4a$ $T - (4 \times 9,8 \sin 30° + 10) = 4a$ ✓ $T - 29,6 = 4a$.....(2) From (1) and (2)/*Vanaf (1) en (2)* $a = 0,61\ m{\cdot}s^{-2}$ $T = 29,6 + (4(0,61)$ ✓ $T = 32,04$ N ✓	(6)
2.4	$F = \frac{Gm1m2}{r2}$ ✓ On the mountain $F = \frac{(6.67 \times 10^{-11})(5.98 \times 10^{24})(65)}{(6.38 \times 10^{6} + 6 \times 10^{6})^2}$ ✓✓ $= 627.2$ N On the ground Fg = mg $= (65 \times 9,8)$ ✓ $= 637$ N Difference = (637 – 627,2) ✓ = 9,8 N ✓	(6)

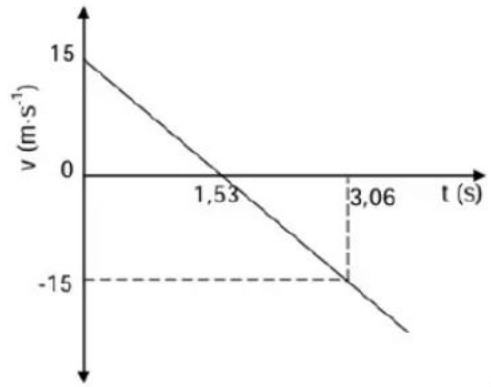
QUESTION 3

3.1	*Free fall* is motion during which the only force acting on an object is the gravitational force ✓✓	(2)
3.2	**OPTION 1/*OPSIE 1*** **Upwards positive/*Opwaarts positief*:** $\Delta y = v_i\Delta t + \frac{1}{2} a\Delta t^2$✓ 0 ✓= $\underline{15\ \Delta t + \frac{1}{2}(-9,8)\ \Delta t^2}$✓ Δt = 3,06 s It takes/*Dit neem* 3,06 s✓ **Downwards positive/*Afwaarts positief*:** $\Delta y = v_i\Delta t + \frac{1}{2} a\Delta t^2$✓ 0✓ = $\underline{-15\ \Delta t + \frac{1}{2}(9,8)\ \Delta t^2}$✓ Δt = 3,06 s It takes/*Dit neem* 3,06 s✓ **OPTION 2/*OPSIE 2*** **Upwards positive/*Opwaarts positief*:** $v_f = v_i + a\Delta t$✓ 0✓ = $\underline{15 + (-9,8)\Delta t}$✓ Δt = 1,53 s It takes (2)(1,53) = 3,06 s✓ **Downwards positive/*Afwaarts positief*:** $v_f = v_i + a\Delta t$✓ 0✓ = $\underline{-15 + (9,8)\Delta t}$✓ Δt = 1,53 s It takes/*Dit neem* 3,06 s✓ **OPTION 3 / *OPSIE 3*** **Upwards positive/*Opwaarts positief*:** $v_f = v_i + a\Delta t$✓ -15 ✓= $\underline{15 + (-9,8)\Delta t}$✓ Δt = 3,06 s✓ **Downwards positive/*Afwaarts positief*:** $v_f = v_i + a\Delta t$✓ 15 ✓= $\underline{-15 + (9,8)\Delta t}$✓ Δt = 3,06 s✓	(4)

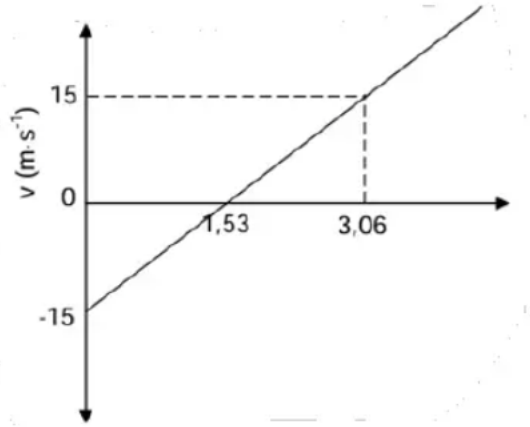
OPTION 3/*OPSIE 3*

Upwards positive/*Opwaarts positief:*	**Downwards positive/*Afwaarts positief:***
Ball A/*Bal A* $\Delta y_A = v_i\Delta t + \frac{1}{2} a\Delta t^2$✓ $\Delta y_A = 15(1,53)$ ✓$+ \frac{1}{2}(-9,8)(1,53)^2$✓ $= 11,48$ m	Ball A/*Bal A* $y_A = v_i\Delta t + \frac{1}{2} a\Delta t^2$✓ $\Delta y_A = -15(1,53)$ ✓$+ \frac{1}{2}(9,8)(1,53)^2$✓ $= -11,48$ (m) $= 11,48$ m upward/*opwaarts*
For ball B/*Vir bal B* $v_f = v_i + a\Delta t$ $v_f = 0 + (-9,8)(1,53)$ $v_f = 14,99\ m{\cdot}s^{-1}$	For ball B/*Vir bal B* $v_f = v_i + a\Delta t$ $v_f = 0 + (9,8)(1,53)$ $v_f = 14,99\ m{\cdot}s^{-1}$
$v_f^2 = v_i^2 + 2a\Delta x$ $14,99^2$✓ $= 0 + 2(-9,8)\ \Delta y_B$✓ $\Delta y_B = -11,47$ (m) $= 11,47$ m downward/*afwaarts*	$v_f^2 = v_i^2 + 2a\Delta x$ $14,99^2$ ✓$= 0 + 2(9,8)\ \Delta y_B$✓ $\Delta y_B = 11,47$ (m)
Distance/*Afstand* $= (y_A + y_B)$ $= 11,48 + 11,47$✓ $= 22,95$ m✓	Distance/*Afstand* $= (y_A + y_B)$ $= 11,48 + 11,47$✓ $= 22,95$ m✓

3.4 **CONSIDER DOWNWARD AS NEGATIVE**



CONSIDER MOTION DOWNWARD AS POSITIVE



Criteria	Marks
Graphs starts at correct initial velocity shown.	✓
Time for maximum height shown (1,53 s)	✓
Time for return shown (3,06)	✓
Shape / Straight line extending beyond 3,06	✓

(4)

[17]

QUESTION 4

4.1	Momentum is the product of mass and velocity of the object. ✓✓	(2)
4.2	$\Delta p = 0$ ✓ $F_{net} = \frac{\Delta p}{\Delta t} = 0$ ✓ **OR/*OF*** $\Delta p = 0$ ✓ $\Delta v = 0 \therefore a = 0 \therefore F_{net} = ma$ ✓ **OR** Gradient of graph $= \frac{\Delta p}{\Delta t} = F_{net}$ ✓ Gradient of the graph between t = 10 s and 20 s ✓	(2)
4.3	**OPTION 1** $F_{net}\Delta t = \Delta p$ ✓ $= -120 - 50$ ✓ $= -170$ $\therefore F_{net}\Delta t = 170$ N·s / kg·m·s^{-1} ✓ **OPTION 2** $F_{net} = \frac{\Delta p}{\Delta t}$ ✓ $= \frac{-120 - 50}{50 - 20}$ $\therefore F_{net} = -5,67$ $F_{net}\Delta t = (-5,67)(30)$ ✓ $= -170$ $\therefore F_{net}\Delta t = 170$ N·s / kg·m·s^{-1} ✓	(3)
4.4	**OPTION 1/ *OPSIE 1*** $\Sigma p_i = \Sigma p_f$ ✓ $-120 + 70$ ✓ $= 50 + p_{Bf}$ ✓ $\therefore p_{Bf} = -100$ $\therefore p_{Bf} = 100$ kg·m·s^{-1} ✓ west / *wes* ✓ **OPTION 2/*OPSIE 2*** $\Delta p_A = -\Delta p_B$ ✓ $50 - (-120)$ ✓ $= -(p_{Bf} - 70)$ ✓ $\therefore p_{Bf} = -100$ $\therefore p_{Bf} = 100$ kg·m·s^{-1} ✓ west / *wes* ✓ **Other formulae/*Ander formules*:** $m_1v_{i1} + m_2v_{i2} = m_1v_{f1} + m_2v_{f2}$ or $m_1u_1 + m_2u_2 = m_1v_1 + m_2v_2$ or $m_Av_{iA} + m_Bv_{iB} = m_Av_{fA} + m_Bv_{fB}$ $p_{total\ before} = p_{total\ after}$ Accept /*Aanvaar*: $p_{before} = p_{after}$ $p_i = p_f$ **Notes/*Aantekeninge*:** • If no formula/principle – Max. $\frac{4}{5}$ *Indien geen formule/beginsel – Maks.* $\frac{4}{5}$ • Mark direction independently. *Sien rigting onafhanklik na.*	(5)
4.5	$P_i = mv_i$ ✓ Let mass of B is M ✓	

	$100 = MV_i$ $V_i = \frac{100}{M}$ ✓	(3)
		[15]

QUESTION 5		
5.1.1	The total mechanical energy (sum of gravitational potential energy and kinetic energy) in an isolated system remains constant / is conserved. ✓✓	(2)
5.1.2	NO✓	(1)
5.1.3	Due to the presence of a non-conservative force between points B and C, energy is converted to other forms. ✓✓	(2)
5.1.4	**OPTION 1/*OPSIE 1***	

Along **AB**/*Langs* **AB**	Along **AB**/*Langs* **AB**
$E_{mechanical\ at\ A} = E_{mechanical\ at\ B}$ $(E_p + E_k)_A = (E_p + E_k)_B$ $(mgh + ½ mv^2)_A = (mgh + ½ mv^2)_B$ } ✓ $(10)(9,8)(4) + 0 = 0 + ½ (10) v_f^2$ ✓ $v_f = 8,85\ m{\cdot}s^{-1}$	$W_{net} = \Delta E_k$ ✓ $F_g \Delta h \cos\theta = ½ m(v_f^2 - v_i^2)$ $(10)(9,8)(4)\cos 0^\circ = ½ (10)(v_f^2 - 0)$ ✓ $v_f = 8,85\ m{\cdot}s^{-1}$

OPTION 1/*OPSIE 1*

Along **AB**/*Langs* **AB**	Along **AB**/*Langs* **AB**
$E_{mechanical\ at\ A} = E_{mechanical\ at\ B}$ $(E_p + E_k)_A = (E_p + E_k)_B$ $(mgh + ½ mv^2)_A = (mgh + ½ mv^2)_B$ } ✓ $(10)(9,8)(4) + 0 = 0 + ½ (10) v_f^2$ ✓ $v_f = 8,85\ m{\cdot}s^{-1}$	$W_{net} = \Delta E_k$ ✓ $F_g \Delta h \cos\theta = ½ m(v_f^2 - v_i^2)$ $(10)(9,8)(4)\cos 0^\circ = ½ (10)(v_f^2 - 0)$ ✓ $v_f = 8,85\ m{\cdot}s^{-1}$

3.3

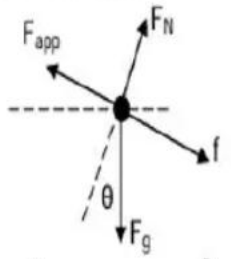
OPTION 1/*OPSIE 1*

Upwards positive/*Opwaarts positief:*	**Downwards positive/*Afwaarts positief:***
$v_f^2 = v_i^2 + 2a\Delta y$ ✓ For ball A/*Vir bal A* $0 = (15)^2$✓ + 2 (-9,8)Δy✓ Δy_A = 11,48 m When A is at highest point *Wanneer A op hoogste punt is* $\Delta y_B = v_i\Delta t + \frac{1}{2} a\Delta t^2$ $= 0 + \frac{1}{2}(-9,8)(1,53)^2$✓✓ Δy_B = -11,47 m Δy_B = 11,47 m downward/*afwaarts* Distance/*Afstand* = $y_A + y_B$ = 11,47 + 11,48 ✓ = 22,95 m✓	$v_f^2 = v_i^2 + 2a\Delta y$ ✓ For ball A/*Vir bal A* $0 = (-15)^2$✓ + 2 (9,8)Δy✓ Δy_A = -11,48 m When A is at highest point *Wanneer A op hoogste punt is* $\Delta y_B = v_i\Delta t + \frac{1}{2} a\Delta t^2$ $= 0 + \frac{1}{2}(9,8)(1,53)^2$✓✓ Δy_B = 11,47 m Δy_B = 11,47 m downward/*afwaarts* Distance/*Afstand* = $y_A + y_B$ = 11,48 + 11,47 ✓ = 22,95 m✓

OPTION 2/*OPSIE 2*

Upwards positive/*Opwaarts positief:*	**Downwards positive/*Afwaarts positief:***
At maximum height v_f = 0: *By maksimum hoogte v_f = 0:* Ball/*Bal* A $\Delta y_A = v_i\Delta t + \frac{1}{2} a\Delta t^2$✓ = 15 (1,53) ✓ + ½ (-9,8) $(1,53)^2$✓ = 11,48 m	At maximum height v_f = 0: *By maksimum hoogte v_f = 0:* Ball/*Bal* A $\Delta y_A = v_i\Delta t + \frac{1}{2} a\Delta t^2$✓ = (-15) (1,53) ✓+ ½ (9,8) $(1,53)^2$✓ = -11,48 m
When A is at highest/point *Wanneer A op hoogste punt is* $\Delta y_B = v_i\Delta t + \frac{1}{2} a\Delta t^2$ $= 0 + \frac{1}{2}(-9,8)(1,53)^2$✓✓ Δy_B = -11,47 m Δy_B = 11,47 m downward/*afwaarts* Distance/*Afstand* = $y_A + y_B$ = 11,48 + 11,47✓ = 22,95 m✓	When A is at highest point *Wanneer A by hoogste punt is* $\Delta y_B = v_i\Delta t + \frac{1}{2} a\Delta t^2$ $= 0 + \frac{1}{2}(-9,8)(1,53)^2$✓✓ Δy_B = -11,47 m Δy_B = 11,47 m downward/*afwaarts* Distance/*Afstand* = ($y_A + y_B$) = 11,48 + 11,47 ✓ = 22,95 m✓

(7)

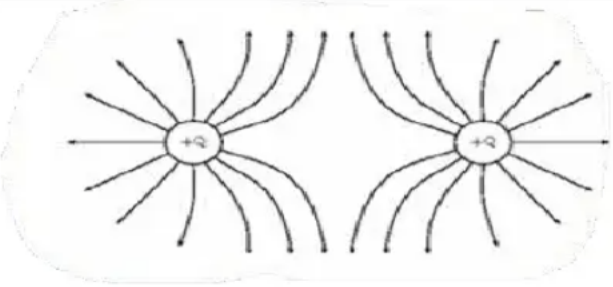
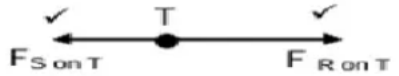
	OPTION 2/*OPSIE 2* Along **AC**/*Langs* **AC** $W_{nc} = \Delta K + \Delta U$✓ $f\Delta x\cos\theta = \Delta K + \Delta U$ $(f)(8)$✓$(\cos 180^{o})$✓ $= (0 - 0)$ ✓ $+ 10\ (9,8)(0 - 4)$ ✓ $f = 49$ N ✓	(6)
5.2.1	$f_k = \mu_k N$✓ $= \mu_k mg\cos\theta$ $= (0,19)(300)(9,8)\cos 25^{o}$✓ $= 506,26$ N✓	(3)
5.2.2	**OPTION 1/*OPSIE 1***  $F_{net} = 0$ $F_{app} + (-F_g\sin\theta) + (-f) = 0$ ✓ $F_{app} - (300)(9,8)\sin 25^{o}$✓ $- 506,26$✓ $= 0$ $F_{app} = 1\ 748,76$ N $P_{ave} = Fv_{ave}$ ✓ $= 1748,76 \times 0,5$✓ $= 874,38$ W ✓	

	OPTION 2/*OPSIE 2* $W_f + W_{app} + W_N + W_g = 0$ ✓ $F\Delta x\cos\theta + F_{app}\Delta x\cos\theta + 0 + F_g\Delta x\cos\theta = 0$ $(506,26\Delta x\cos 180^0)$✓ + $(F_{app}\Delta x\cos 0) + 300(9,8)\Delta x\cos 115^0$✓ = 0 $F_{app} = 1748,76$ N $P_{ave} = Fv_{ave}$✓ $= (1748,76)(0,5)$✓ $= 874,38$ W✓ **OPTION 3/*OPSIE 3*** $W_f + W_{app} + W_N + W_g = 0$✓ $F\Delta x\cos\theta + F_{app}\Delta x\cos\theta + 0 + F_g\sin\theta\Delta x\cos\theta = 0$ $(506,26\Delta x\cos 0)$ ✓ + $(F_{ap}\Delta x\cos 0) + 300(9,8)\sin 25^0\ \Delta x\cos 180)$ ✓ = 0 $F_{app} = 1\,748,76$ N $P_{ave} = Fv_{ave}$✓ $= (1\,748,76)(0,5)$✓ $= 874,38$ W✓	(6)
		[20]

QUESTION 6

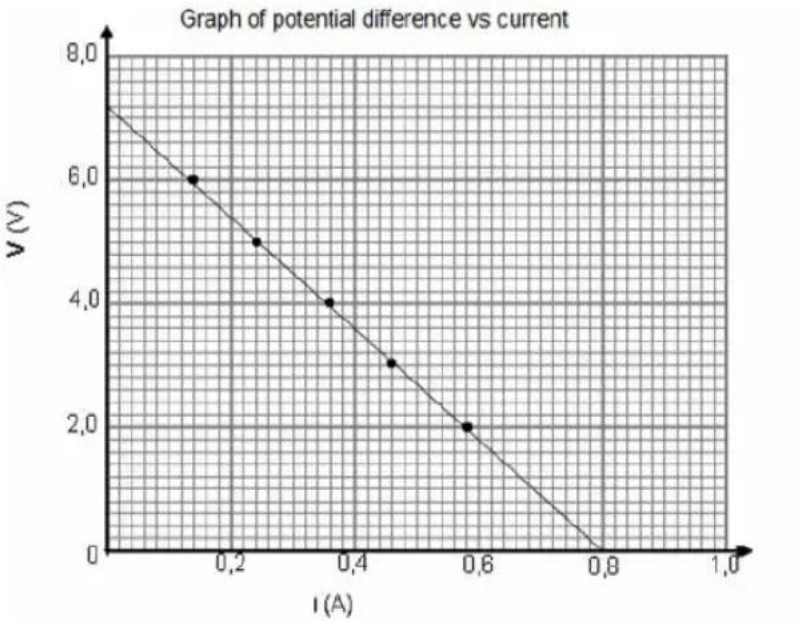
6.1	Red shift is a shift in the spectra of distant stars towards the longer wavelength / red end of the spectrum. ✓✓	(2)
6.2	Moving away from the earth. ✓ The wavelength of the light coming from the distant star has increased / shift towads longer wavelength. ✓	(2)
6.3.1	The difference between the speed of the car and the speed of light is very large. ✓ The frequency shift / increase is too small to observe. ✓	(2)
6.3.2	$f_L = \frac{v \pm v_L}{v \pm v_S} f_S$ OR $f_L = \frac{v}{v - v_S} f_S$ ✓ $\therefore f_L = \frac{340}{340 - 77,78}(1200)$ ¿ $1555,95\ Hz$	(4)
		[10]

QUESTION 7

7.1	To ensure that charge does not leak to the ground. / In order to retain the charge / to insulate the charges. ✓✓	(2)
7.2	$Net\ charge = \frac{Q_R + Q_s}{2} = \frac{+8+(-4)}{2} = 2\mu C$	(3)
7.3	 **Criteria for sketch** / **Marks** Correct direction of field lines Shape of the electric field No lines crossing each other / No field lines inside the spheres	(3)
7.4		(2)
7.5	**OPTION 1** $F = k\frac{Q_1 Q_2}{r^2}$ ✓ $F_{ST} = (9\times10^{9})\frac{(1\times10^{-6})(2\times10^{-6})}{(0,2)^2}$ ¿$0,45\ N / 4,5\times10^{-1}\ N$left **OR** $F = k\frac{Q_1 Q_2}{r^2}$	

	$F_{TS}=\frac{1}{4}F_{RT}=\frac{1}{4}(1,8)=0,45\,N$ right ✓ ¿ $0,45\,N/4,5\times10^{-1}\,N$ $F_{RT}=(9\times10^{9})\frac{(2\times10^{-6})(1\times10^{-6})}{(0,1)^2}=1,8N$ right OR $F_{RT}=4F_{ST}=4(0,45)=1,8\,N$ right $F_{net}=F_{ST}+F_{RT}=1,8+(-0,45)$ ✓ ¿ $1,35\,N$ or towards sphere S or right of S ✓ **OPTION 2** $E_R=\frac{kQ}{r^2}=\frac{(9\times10^{9})(2\times10^{-6})}{(0,1)^2}=1,8\times10^{6}N.C^{-1}$ right $E_S=\frac{kQ}{r^2}=\frac{(9\times10^{9})(2\times10^{-6})}{(0,2)^2}=4,5\times10^{5}N.C^{-1}$ left $E_{net}=1,8\times10^{6}-4,5\times10^{5}=1,35\times10^{6}N.C^{-1}$ right $F=EQ=(1,35\times10^{6})(1\times10^{-6})$ ¿ $1,35\,N$ towards sphere S ✓	(7)
7.6	Force experienced per unit positive charge placed at that point.	(2)
7.7	**OPTION 1** $E=\frac{F}{q}=\frac{1,35}{1\times10^{-6}}=1,35\times10^{6}N.C^{-1}$ **OPTION 2** $E_R=\frac{kQ}{r^2}=\frac{(9\times10^{9})(2\times10^{-6})}{(0,1)^2}=1,8\times10^{6}N.C^{-1}$ right $E_S=\frac{kQ}{r^2}=\frac{(9\times10^{9})(2\times10^{-6})}{(0,2)^2}=4,5\times10^{5}N.C^{-1}$ left $E_{net}=1,8\times10^{6}-4,5\times10^{5}=1,35\times10^{6}N.C^{-1}$ **OPTION 3** $E=\frac{F}{q}=\frac{1,8}{1\times10^{-6}}=1,8\times10^{6}N.C^{-1}$ $E=\frac{F}{q}=\frac{0,45}{1\times10^{-6}}=4,5\times10^{5}N.C^{-1}$ $E_{net}=1,8\times10^{6}-4,5\times10^{5}=1,35\times10^{6}N.C^{-1}$	(4)
		[23]

QUESTION 8

8.1.1	The temperature of the battery must be kept constant ✓	(1)
8.1.2 .	 Criteria for drawing line of best fit: ALL points correctly plotted (at least 4 points) ✓ ✓ Correct line of best fit if all plotted points are used (at least 3 points)✓	(3)
8.1.3	7,2 V (accept any answer between 7,0 -7,4 V) ✓ ✓	(2)
8.1.4	Slope $= \frac{\Delta V}{\Delta I}$ $= \frac{0-7,2}{0,8-0} = -9$ $r = 9\Omega$	(3)
8.2.1	**OPTION 1** $P = VI$ ✓ $100 = 20(I)$ ✓	

	$I=5\,A$ ✓ **OPTION 2** $P=\frac{V^2}{R}$ $100=\frac{(20)^2}{R}$ $R=4\,\Omega$ $V=IR$ $20=I(4)$ $I=5\,A$ **OPTION 3** $P=\frac{V^2}{R}$ $100=\frac{(20)^2}{R}$ $R=4\,\Omega$ $P=I^2R$ $100=I^2(4)$ ✓ $I=5\,A$ ✓	(3)
8.2.2 .		

OPTION 1/*OPSIE 1*

$P = \frac{V^2}{R}$ ✓

$R = \frac{(20)^2}{150}$ ✓

$= 2,67\ \Omega$ ✓

OPTION 2/OPSIE 2

$P = VI$ ✓

$150 = (20)I$

$I = 7,5\ A$

$V = IR$

$20 = (7,5)R$ ✓

$R = 2,67\ \Omega$ ✓

OR/*OF*

$P = I^2R$

$150 = (7,5)^2R$ ✓

$R = 2,67\ \Omega$ ✓

OPTION 3/*OPSIE 3*

$I_X : I_Y$

$5 : 7,5$

$1 : 1,5$

$R_X : R_Y$

$1,5 : 1$ ✓

4 ✓: 2,67 Ω ✓

(3)

8.2.3

OPTION 1/*OPSIE 1*

$P = VI$ **OR/*OF*** $P = I^2R$

$I_{150W} = \frac{150}{20}$ ✓ $= 7,5\ A$ $I_{150W} = \sqrt{\frac{150}{2,67}}$ ✓ $= 7,5\ A$

$I_{tot} = (5 + 7,5)$ ✓

$\varepsilon = I(R + r)$ ✓

$24 = 12,5(R + r)$

$24 = V_{ext} + V_{ir}$

$24 = 20 + 12,5(r)$ ✓

$r = 0,32\ \Omega$ ✓

	OPTION 2/*OPSIE 2*
	$V = Ir$ ✓
	$I_{tot} = (5 + 7,5)$ ✓
	$(24 - 20)$ ✓ $= 12,5\,r$ ✓
	$\therefore r = \frac{4}{12,5}$
	$r = 0,32\ \Omega$ ✓
	
	OPTION 3/*OPSIE 3*
	$\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2}$
	$\frac{1}{R_{//}} = \frac{1}{4} + \frac{1}{2,67}$ ✓ OR/*OF* $R_{//} = \frac{(4)(2,67)}{4 + 2,67}$
	$\therefore R_{//} = 1,6\ \Omega$
	$I_{tot} = \frac{20}{1,6} = 12,5\ A$ ✓
	$\varepsilon = I(R + r)$ ✓
	$24 = 12,5(R + r)$
	$24 = V_{ext} + V_{ir}$
	$24 = 20 + 12,5(r)$ ✓
	$r = 0,32\ \Omega$ ✓
		(5)

8.2.4	**D**evice Z is a voltmeter ✓✓	(2)
8.2.5	Device Z should be a voltmeter (or a device with very high resistance) because it has a very high resistance and will draw very little current. ✓ The current through X and Y will remain the same hence the device can operate as rated. ✓	(2)
		[24]