Education and Sports Development

Department of Education and Sports Development
Department van Onderwys en Sport Ontwikkeling
Lefapha la Thuto le Tlhabololo ya Metshameko
NORTH WEST PROVINCE

NATIONAL SENIOR CERTIFICATE
NASIONALE SENIOR SERTIFIKAAT

GRADE/*GRAAD* 12

TECHNICAL SCIENCES: P1
TEGNIESE WETENSKAPPE: V1

2019

MARKING GUIDELINES/*NASIENRIGLYNE*

MARKS/*PUNTE*: 150

This memorandum consists of 16 pages.
Hierdie memorandum bestaan uit 16 bladsye.

QUESTION 1/*VRAAG* 1

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

QUESTION 2/*VRAAG* 2

2.1 The rate of change of velocity. ✓✓
Die tempo van verandering in snelheid. ✓✓ (2)

2.2 Take Right/East as Positive
Neem Regs/Oos as positief
Fnet = F_k + Fa ✓

Fnet = - 2 + 5 ✓

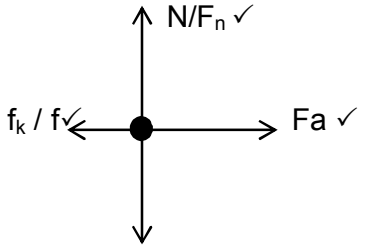
Fnet = 3 N, (to the right/ *na regs*) ✓ (3)

NOTE/*NOTA*: accommodate other means of direction correctly used: e.g to the right depending on the choice of direction.
akkomodeer ander rigtings as korrek: b.v. na regs afhangend van gekose rigting.

2.3

2.3.1 When a net force F_{net} is applied to an object of mass (m) it accelerates in the direction of the net force ✓✓. This acceleration is directly proportional to the net force and inversely proportional to the mass of the object. ✓
Wanneer 'n netto krag op 'n voorwerp inwerk, versnel die voorwerp in die rigting van die netto krag Hierdie versnelling is direk eweredig aan die netto krag en omgekeerd eweredig aan die massa. ✓ (2)

2.3.2



Note/*Nota:*

- Allocate mark for arrow and label.
- *Gee punt vir pylpunt en bemoem.*

Penalise if/ *Penaliseer indien:*

- No arrow (Penalise ONCE)
- *Geen pyle (Penaliseer EENMAAL)*
- Gaps between the line and the dot
- Spasie tussen die lyn en die kol
- Dotted lines are used
- Stippelyne gebruik is
- Additional force is included (-1)
- *Addisionele kragte ingesluit (-1)*

2.4

2.4.1 (Take right as positive/*Neem regs as positief)*

<table>
<tr><th colspan="2">OPTION 1/OPSIE 1</th></tr>
<tr><td>For 2 kg block/ Vir die 2 kg blok</td><td>For 4 kg block/Vir die 4 kg blok</td></tr>
<tr><td colspan="2">for any formula/ vir enige formule</td></tr>
<tr><td colspan="2">✓ one mark/een punt</td></tr>
<tr><td>$F_{net} = ma$
$T = ma$
$\underline{T = 2a}$ ✓
$T = 2a$ ……..(1)</td><td>$F_{net} = ma$
$Fa + (-T) = ma$
$\underline{12 - T}$ ✓$= \underline{4a}$ ✓
$12 - T = 4a$……..(2)</td></tr>
<tr><td colspan="2">Addittion of equation: (1) and (2)/ Optel van vergelyking: (1) en (2)

$T = 2a$ ……..(1)
$\underline{12 - T = 4a}$……(2)
$\underline{12 = 6a}$ ✓
$a = \underline{2\ m.s^{-2}}$; (to the right/na regs) ✓</td></tr>
<tr><th colspan="2">OPTION 2/OPSIE 2</th></tr>
<tr><td colspan="2">$F_{net} = ma$
$F_A + T + (-T) = (m_{2kg} + m_{4kg})a$ ✓ } for any formula/vir enige formule
$\underline{12}$ ✓ + $\underline{0}$ ✓ = $\underline{(2 + 4)a}$ ✓
$\underline{12 = 6a}$ ✓
$a = 2\ m.s^{-2}$; (to the right/ na regs) ✓ (6)</td></tr>
</table>

NOTE/*NOTA*: Accommodate other means of direction correctly used: e.g to the right depending on the choice of direction.
Akkomodeer ander rigtings as korrek: b.v. na regs afhangend van gekose rigting.

2.4.2 **[Positive marking from 2.4.1 above]**
[Positiewe merk vanaf 2.4.1]

OPTION 1/*OPSIE 1*	OPTION 2/*OPSIE 2*
$F_{net} = ma$	$F_{net} = ma$
$T = 2a$ ✓	$12 + T = 4a$ ✓
$T = 2(2)$ ✓	$12 + T = 4(2)$ ✓
$T = 4\ N$ ✓	$T = 4\ N$ ✓ (3)

2.5 Decrease/*Afname* ✓ (1)

[21]

QUESTION 3/*VRAAG* 3

3.1

3.1.1 Impulse is the product of the net/resultant force acting on an object and the time the net/resultant force acts on the object. ✓✓
Impuls is die produk van die netto krag wat op 'n voorwerp inwerk en die tyd wat die netto krag op die voorwerp inwerk. ✓✓ (2)

3.1.2 (Take towards the wall as positive/*Neem na die muur as positief)*

Impulse/*Impuls* = Δp
Impulse/*Impuls* = $mv_f - mv_i$ ✓ any formula/*vir enige formule*
Impulse/*Impuls* = $m(v_f - v_i)$
Impulse/*Impuls* = $\underline{0,15}$ ✓ $(\underline{-16 - 20})$ ✓
Impulse/*Impuls* = - 5, 4
Impulse/*Impuls* = $\underline{5, 4\ N.s}$ (Away from the wall/ Weg vanaf die muur) ✓ (4)

NOTE: Accommodate other means of direction correctly used: e.g towards the wall depending on the choice of direction.
akkomodeer ander rigtings as korrek: b.v. na die muur afhangend van gekose rigting.

3.2

3.2.1 The total linear momentum of an isolated system remains constant/ is conserved (in magnitude and direction). ✓✓
Die totale lineêre momentum van 'n geïsoleerde sisteem bly konstant/(word behou) in grootte en rigting. ✓✓
ACCEPT/*AANVAAR*
In an isolated system, the total linear momentum before the collision/explosion is equal the total linear momentum after the collision/explosion.
In 'n geïsoleerde sisteem is die totale lineêre momentum voor die botsing/ontploffing gelyk aan die totale lineêre momentum na die botsing/ontploffing. ✓✓ (2)

3.2.2 (Take east as positive/*Neem oos as positief)*

$\Delta p_{net} = 0$
$p_{T(before/voor)} = p_{T(after/na)}$ ✓ any formula/*enige formule*
$p_{1i} + p_{2i} = p_{1f} + p_{2f}$
$m_1v_{i2} + m_2v_{i2} = (m_1 + m_2)v_{f1-2}$

$\underline{(2500)(19)}$ ✓ + $\underline{(1\ 000)(-33)}$ ✓ = $\underline{(2500 + 800)}\ v_{f1-2}$ ✓

$47500 - 33000 = 3300v_{f1-2}$
$14500 = 3300v_{f1-2}$
$v_{f1-2} = 4, 39\ m.s^{-1}$; (due east/ *oos*) ✓ (5)

NOTE: accommodate other means of direction correctly used: e.g due East depending on the choice of direction./*akkomodeer ander rigtings as korrek b.v. oos afhangend van gekose rigting*

3.2.3 **(Positive marking from 3.2.2 above)**
(Positiewe merk vanaf 3.2.2)

any formula/*enige formule*

$\Sigma E_{kbefore/voor} = E_{ki-1} + E_{ki-2}$ ✓

$= \frac{m_1 v_{i-2}^2}{2} + \frac{m_2 v_{i-2}^2}{2}$

$= \frac{2500(19)^2}{2} + \frac{1000(33)^2}{2}$ ✓

$= 995750$ J ✓

$\Sigma E_{kafter/na} = E_{kf-1} + E_{kf-2}$

$= \frac{m_1 v_{f-1}^2}{2} + \frac{m_2 v_{f-2}^2}{2}$

$= \frac{2500(24,39)^2}{2} + \frac{1000(24,39)^2}{2}$ ✓

$= 33726,175$ J ✓

$\Sigma E_{kbefore/voor} \neq \Sigma E_{kafter/na}$

∴ The collision is inelastic/*Die botsing is onelasties* ✓ (6)

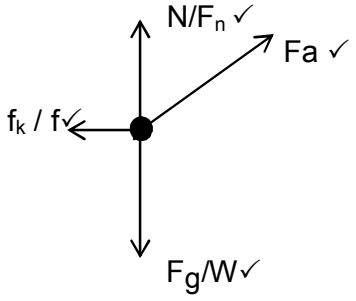
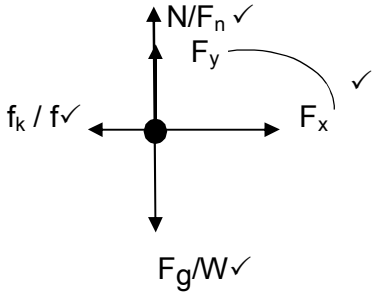
3.2.4 According to the formula $F_{net}.\Delta t = \Delta p$, the contact time between the driver and the airbag will be longer, ✓
while the change in momentum remains constant or remains the same.✓
Thus this effect will reduce the net/resultant force. ✓
Volgens die formule $F_{net}.\Delta t = \Delta p$, sal die kontaktyd tussen die bestuurder en die lugsak verleng, ✓
terwyl die verandering in momentum constant of dieselfde bly. ✓
Dus sal die effek die netto/resultante krag verlaag. ✓ (3)

[22]

QUESTION 4/*VRAAG* 4

4.1 The product of the applied force on an object and the displacement in the direction of the force. ✓✓
Die produk van die toegepaste krag op 'n voorwerp en die verplasing in die rigting van die krag. ✓✓ (2)

4.2

OPTION 1/*OPSIE 1*	**OPTION 2/*OPSIE 2***
	 (4)

Note/*Nota:*

- Allocate a mark for the arrow and label.
- *Gee 'n punt vir die pylpunt en bemoem*

Penalise if/ *Penaliseer indien:*

- No arrow (Penalise ONCE)/*Geen pyle (Penaliseer EENMAAL)*
- Gaps between the line and the dot/*Spasie tussen die lyn en die kol*
- Dotted lines are used/*Stippelyne gebruik is*
- Additional forces included (-1)/*Addisionele kragte (-1)*

4.3

4.3.1

OPTION 1/*OPSIE 1*	**OPTION 2/*OPSIE 2***
$W_{Fa} = Fa.\Delta x.\cos\theta$ $W_{Fx} = Fx.\Delta x.\cos\theta$ ✓ $W_{Fx} = (F.\cos\theta).\Delta x.\cos\theta$ $W_{Fx} = \underline{(15.\ Cos30^0)(5)}$ ✓ $\underline{\cos0^0}$ ✓ $W_{Fx} = 64,95$ J✓ (4)	$W_{Fa} = Fa.\Delta x.\cos\theta$ $W_{Fx} = (F.\cos\theta).\Delta x.\cos\theta$ ✓ $W_{Fx} = 15.\underline{(5)\ \cos0^0}$ ✓ $W_{Fx} = 75$ J **Note/*Nota:***: ($^2\!/_4$)

4.3.2

$W_{fk} = \underline{f_k.\Delta x.\cos\Theta}$

$W_{fk} = \underline{2,5.\cos(180^0)}$ ✓

$W_{fk} = \underline{-10\ J}$ ✓ (2)

[12]

QUESTION 5/*VRAAG 5*

5.1 The total mechanical energy in an isolated system remains constant or is conserved. ✓✓/*Die totale meganiese energie in 'n geslote stelsel bly konstant.* ✓✓

ACCEPT/AANVAAR:
The sum of gravitational potential energy and kinetic energy of an isolated system remains constant or is conserved
Die som van gravitasie potensiële energie en kinetiese energie in 'n geslote stelsel bly konstant. ✓✓ (2)

5.2 $ME = Ep + E_k$
$ME = mgh + \frac{1}{2}mv^2$ ✓ any formula/enige formule

$ME = (1000)(9,8)(1,5) + 0$ ✓
$ME = 14700$ J ✓or $ME = 14,7$ kJ (3)

5.3 **(Positive marking from 5.2 above)**
***(Positiewe merk vanaf 5.2*)**

OPTION 1/*OPSIE 1*

ME at/ by A $= ME$ at/ by B
$(E_k + E_p)_A = (E_k + E_p)_B$
$ME = (\frac{1}{2}mv^2 + mgh)_B$ ✓ any formula/*enige formule*

14700 ✓$= \underline{(1000)(9,8)(0)}$ ✓$+ \frac{1}{2}(1000)v^2$ ✓
$14700 = 0 + 500v^2$
$v = \sqrt{29,4}$
$v = 5,42$ m.s^{-1} ✓ (5)

OPTION 2/*OPSIE 2*	**OPTION 3/*OPSIE 3***
(Take downwards as positive) *(Neem afwaarts as positief)* $v_f^2 = v_i^2 + 2g\Delta y$ ✓ $v_f^2 = 0^2$ ✓$+ \underline{2(9,8)(1,5)}$ ✓ $v_f = \sqrt{29,4}$ $v_f = 5,42$ m.s^{-1} ✓ **Note/*Nota***: (✓/✓)	$v_f = \sqrt{2g\Delta y}$ $v_f = \sqrt{(2)(9,8)(1,5)}$ ✓ $v_f = \sqrt{29,4}$ $v_f = 5,42$ m.s^{-1} ✓ **Note/*Nota***: (✓/✓)

5.4

5.4.1 Power is the rate at which work is done or energy is transferred.✓✓
Drywing is die tempo waarteen arbeid verrig of energie verbruik word.✓✓ (2)

5.4.2 $P = Fv$ ✓

$40 \times 10^3 = F.25$ ✓

$F = 1\,600$ N/1,6 kN ✓ (3)

[15]

QUESTION 6/*VRAAG* 6

6.1 Strain is the ratio of change in the dimension/length of objects to the original dimension/length.✓✓
Vervorming is die verhouding van verandering in dimensie tot die oorspronklike dimensie.✓✓

Accept/*Aanvaar*:
The change in length over the original length of an object.✓✓
Die verandering in lengte van die voorwerp tot die oorspronklike lengte.✓✓ (2)

6.2 Hooke's law states that, within the limit of elasticity, stress is directly proportional to the strain.✓✓
Hooke se wet bepaal dat spanning, in die grens van elastisiteit, direk eweredig is aan die rekking.✓✓ (2)

6.3

6.3.1 $\sigma = \frac{F}{A}$ ✓

1×10^6 ✓ $= \frac{F}{2 \times 10^{-3}}$ ✓

$F = 2\,000$ N/2 kN✓ (4)

6.3.2 $\varepsilon = \frac{\Delta L}{L}$ ✓

$= \frac{1 \times 10^{-3}}{50}$ ✓

$= 2 \times 10^{-5}$ ✓ (3)

NOTE/*NOTA*: Penalise if units are included (**final answer**).
*Penaliseer indien eenhede by **finale** antwoord gegee is*

6.3.3 $K = \frac{\sigma}{\varepsilon}$ ✓

$K = \frac{1 \times 10^6}{2 \times 10^{-5}}$ ✓

$K = 5 \times 10^{10}$ N.m^{-2}/Pa ✓ (3)

[14]

QUESTION 7/*VRAAG* 7

7.1 Viscosity is defined as the property of the fluid to oppose relative motion between the two adjacent layers.✓✓
Viskositeit is die eienskap van die vloeistof om relatiewe beweging tussen die twee aangrensende vlakke te opponeer.✓✓

ACCEPT/*AANVAAR:*
Measure of resistance to flow of a liquid.✓✓
Mate van weerstand teen vloei van 'n vloeistof.✓✓ (2)

7.2 If the temperature of the fluid increases, its viscosity decreases.✓✓
As die temperatuur van die vloeistof toeneem, neem die viskositeit af ✓✓

ACCEPT/*AANVAAR:*
Viscosity increase with a decrease in temperature of the liquid. ✓✓)\
Viskositeit neem toe met 'n afname in temperatuur van die vloeistof.✓✓ (2)

7.3.1 Pascal's law states that in a continuous liquid at equilibrium, the pressure applied at a point is transmitted equally to the other parts of the liquid.✓✓
Pascal se wet bepaal dat in 'n kontinue vloeistof by ewewig, die druk by enige punt eweredig oorgedra word na al die ander dele van die vloeistof. ✓✓ (2)

7.3.2 $\frac{F_1}{A_1} = \frac{F_2}{A_2}$

$\frac{F_A}{A_A} = \frac{F_B}{A_B}$ ✓ any formula/*enige formule*

$\frac{F_A}{0,5} = \frac{100}{2}$ ✓ ✓

F_A = 250 N ✓ (4)

7.3.3

• bulldozer's working systems • hydraulic power brakes on automobiles • dentists' chairs • hydraulic lifts used to lift heavy loads • car jacks, lift • Forklifts • Jack Hammer • Office chairs • Hydraulics press • Hydraulic Excavator **Any Three**	• *stootskraper se sisteme* • *hidrouliese kragremme van motorvoertuie* • *tandartstoele* • *hidrouliese hysers om swaar voorwerpe op te lig* • *Voertuig hyser* • *Vurkhyser* • *"Jack Hammer"* • *Kantoorstoele* • *Hidrouliese pers* • *Hidrouliese laaigraaf* ✓✓✓ ***Enige drie*** (3)

[13]

QUESTION 8/*VRAAG* 8

8.1 Doping is the process of adding impurities to intrinsic semiconductors. ✓✓
Doepatoevoeging/*Dotering is die proses waardeur onsuiwerhede by 'n suiwer halfgeleier gevoeg word*. ✓✓ (2)

8.2 Intrinsic semiconductors have very little current conduction capacity. However, if a very small amount of impurity is added, the conductivity is increased significantly. ✓✓
Intrinsieke halfgeleiers het min geleidingsvermoë. Maar wanneer klein hoeveelhede onsuiwerhede bygevoeg word, vermeerder die geleidingsvermoë aansienlik. ✓✓ (2)

8.3
8.3.1 Capacitor is a device that stores electrical charge.✓✓ (2)
Kapasitor is 'n toestel wat elektriese lading stoor.✓✓ (2)

8.3.2 $C = \frac{\varepsilon_0 A}{d}$ ✓

$C = \frac{8,85 \times 10^{-12} \times 2 \times 10^{-4}}{0,023}$ ✓ ✓

$C = 1,77 \times 10^{-12}$ F or C = 1,77 pF✓ (4)

8.3.3
- The total surface area of the plates. ✓
- *Die totale oppervlakte van die plate.* ✓
- The distance between the TWO plates. ✓
- *Die afstand tussen die TWEE plate*
- The types of dielectric material. ✓
- *Die tipe diëlektriese medium.* ✓ (3)

8.4
8.4.1

OPTION 1/*OPSIE 1*	OPTION 2/*OPSIE 2*	OPTION 3/*OPSIE 3*
P = VI ✓	$P = I^2.R$ ✓	$P = \frac{V^2}{R}$ ✓
P = (240) (24)✓	$P = 24^2.10$ ✓	$P = \frac{240^2}{10}$ ✓
P = 5760 W ✓	P = 5760 W ✓	P = 5760 W ✓ (3)

8.4.2

OPTION 1/*OPSIE 1*	**OPTION 2/*OPSIE 1***
$W = I^2.Rt$ ✓ $W = \frac{(24^2)(10)}{(10 \times 3600)}$ ✓✓ $W = 2,074 \times 10^8$ J ✓	$W = VI.Rt$ ✓ $W = \frac{(240)(24)}{(10 \times 3600)}$ ✓✓ $W = 2,074 \times 10^8$ J ✓

OPTION 3/*OPSIE 1*

$$W = \frac{V^2 \Delta t}{R} \checkmark$$

$$W = \frac{(240^2)(10 \times 3600)}{10} \checkmark$$

$W = 2,074 \times 10^8$ J ✓ (4)

[20]

QUESTION 9/*VRAAG* 9

9.1 Faraday's law states that when the magnetic flux linked with the coil changes, an emf is induced in the coil.✓ The magnitude of the induced emf is directly proportional to the rate of change of magnetic flux.✓
Faraday se wet bepaal dat, wanneer die magnetiese vloed wat met die spoel verbind is verander, 'n emk in die spoel geïnduseer word.✓*Die grootte van die geïnduseerde emk is direk eweredig aan die tempo van verandering van die magnetiese vloed.*✓ (2)

9.2 $\varepsilon = N \frac{\Delta \Phi}{\Delta t}$ ✓

$\varepsilon = 500 \frac{0,06 - 0,05}{0,3}$ ✓ ✓

$\varepsilon = -16.67$ V ✓ (4)

9.3 $\frac{V_s}{V_p} = \frac{N_s}{N_p}$ ✓

$\frac{V_s}{240}$ ✓ $= \frac{100}{200}$ ✓

$V_s = 120$ V ✓ (4)

9.4

9.4.1 Slip ring/*Sleepring* ✓ (1)

9.4.2 Carbon Brushes/*Koolstofborsel* ✓ (1)

9.4.3 Mechanical energy to electrical energy
Meganiese energie na elektriese energie. ✓ (1)

[13]

Question 1						
	Content	Levels				Marks
		1	2	3	4	
1.1	*Newton's laws*	✓				2
1.2	*Momentum*	✓				2
1.3	*Energy*			✓		2
1.4	*Power*		✓			2
1.5	*Electronic Properties*	✓				2
1.6	*Viscosity*		✓			2
1.7	*Hydraulics*	✓				2
1.8	*Electric circuit*				✓	2
1.9	*Capacitors*	✓				2
1.10	*Electric machine*	✓				2
	Total	12	4	2	2	20
Question 2						
	Content	Levels				Marks
		1	2	3	4	
2.1	*Newton's laws*	✓				2
2.2	*Newton's laws*		✓			3
2.3.1	*Newton's laws*	✓				2
2.3.2	*Newton's laws*	✓				4
2.4.1	*Newton's laws*			✓		6
2.4.2	*Newton's laws*		✓			3
2.5	*Newton's laws*				✓	1
	Total	8	6	6	1	21
Question 3						
	Content	Levels				Marks
		1	2	3	4	
3.1.1	*Momentum*	✓				2
3.1.2	*Momentum*		✓			4
3.2.1	*Momentum*	✓				2
3.2.2	*Momentum*			✓		5
3.2.3	*Momentum*				✓	6
3.2.4	*Momentum*				✓	3
	Total	4	4	5	9	22

Question 4						
	Content	Levels				Marks
		1	2	3	4	
4.1	*Work*	✓				2
4.2	*Work*	✓				4
4.3.1	*Work*			✓		4
4.3.2	*Work*		✓			2
	Total	6	2	4	0	12

Question 5						
	Content	Levels				Marks
		1	2	3	4	
5.1	*Energy*	✓				2
5.2	*Energy*		✓			3
5.3	*Energy*			✓		5
5.4.1	*Power*	✓				2
5.4.2	*Power*		✓			3
	Total	4	6	5	0	15

Question 6						
	Content	Levels				Marks
		1	2	3	4	
6.1	*Elasticity*	✓				2
6.2	*Elasticity*	✓				2
6.3.1	*Elasticity*		✓			4
6.3.2	*Elasticity*		✓			3
6.3.3	*Elasticity*		✓			3
	Total	4	10	0	0	14

Question 7						
	Content	Levels				Marks
		1	2	3	4	
7.1	*Viscosity*	✓				2
7.2	*Viscosity*		✓			2
7.3.1	*Hydraulics*	✓				2
7.3.2	*Hydraulics*			✓		4
7.3.3	*Hydraulics*	✓				3
	Total	7	2	4	0	13

Question 8						
	Content	Levels				Marks
		1	2	3	4	
8.1	*Electronic Properties*	✓				2
8.2	*Electronic Properties*		✓			2
8.3.1	*Capacitors*	✓				2
8.3.2	*Capacitors*		✓			4
8.3.3	*Capacitors*	✓				3
8.4.1	*Electric circuits*		✓			3
8.4.2	*Electric circuits*		✓			4
Total		7	13	0	0	20
Question 9						
	Content	Levels				Marks
		1	2	3	4	
9.1	*Electromagnetism*	✓				2
9.2	*Electromagnetism*			✓		4
9.3	*Electromagnetism*		✓			4
9.4.1	*Electromagnetism*	✓				1
9.4.2	*Electromagnetism*	✓				1
9.4.3	*Electromagnetism*	✓				1
Total		5	4	4	0	13

SUMMARY OF THE LEVELS OF THINKING (COGNITIVE LEVELS)

Question	Level 1	Level 2	Level 3	Level 4	Total
1	12	4	2	2	**20**
2	8	6	6	1	**21**
3	4	4	5	9	**22**
4	6	2	4	0	**12**
5	4	6	5	0	**15**
6	4	10	0	0	**14**
7	7	2	4	0	**13**
8	9	13	0	0	**20**
9	5	4	4	0	**13**
Overall total	**57**	**51**	**30**	**12**	**150**
%	**38.00 %**	**34.00 %**	**20.00 %**	**8.00 %**	**100 %**

Weighting of prescribed content (**Adapted from CAPS p. 60**)
(Expected)

Paper 1								
Content	**Marks**	**%**	**Total**	**Duration**	**Weighting of questions across cognitive levels**			
Mechanics	108	72	150 marks	3 hours	40	30	20	10
Electricity and Magnetism	42	28						
Exam(Actual)								
Mechanics	108	**72, 00**	150 marks	3 hours	38, 00	34, 00	20, 00	8, 00
Electricity and Magnetism	42	**28, 00**						