LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF
EDUCATION

NATIONAL

SENIOR CERTIFICATE

GRADE 12

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ERRATA/AMENDED MG

PHYSICAL SCIENCES/*FISIESE WETENSKAPPE*

CONTROL TEST 1 MARKING GUIDELINE/*KONTROLE TOETS 1 NASIENRIGLYNE*

17 March/*Maart* 2025

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MARKS/*PUNTE* : **100**

This marking guideline consists of 12 pages/*Hierdie nasienriglyne bestaan uit 12 bladsye*

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QUESTION/*VRAAG* 1

1.1 A ✓✓

1.2 D✓✓

1.3 B or/*of* C ✓✓

1.4 B ✓✓

1.5 B✓✓

1.6 B ✓✓

1.7 ~~A ✓✓~~ **(remove)**

1.8 C ✓✓

1.9 C✓✓

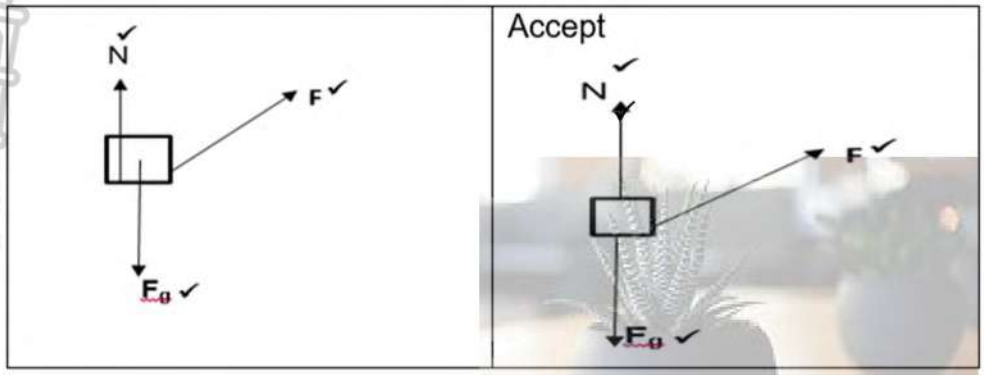
1.10 A✓✓

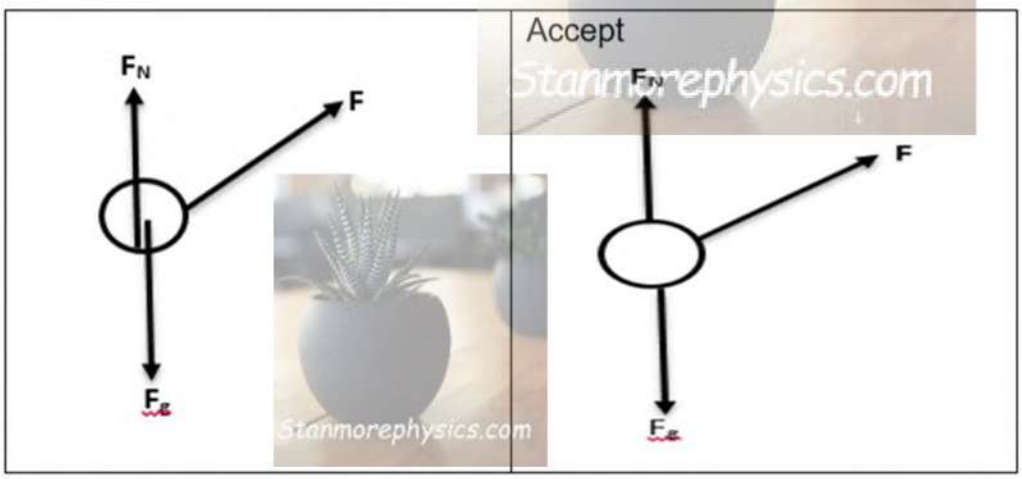


[20 - 2] = [18]

QUESTION/*VRAAG* 2

2.1





ACCEPTABLE LABELS/*AANVAARDE BYSKRIFTE*	**NOTES/*NOTAS***
F_N: Normal force/Normaalkrag F_g: w/weight/force due to gravity / *gewig/krag agv gravitasie* F_A: 10 N/Applied force/*Toegepaste krag*	ONE mark for each force represented by an arrow with a correct label/*Een punt vir elke krag wat deur 'n pyl met 'n korrekte byskrif voorgestel word* **Penalise** ONCE for each of the following:/***Penaliseer** EEN KEER vir elk van die volgende*: • No arrow/*geen pyl* • Gap between the line and the block/*spasie tussen die lyne en die blok* • Dotted line is used/*stippellyn word gebruik* • Free body diagram drawn/Vryeliggaan diagram geteken • *Components are drawn/Komponente geteken*

(3)

2.2 **OPTION 1/*OPSIE 1***

$F_{net} = ma$
$F_x - f_k = ma$
$10\,cos\,15^o - 0{,}53((3 \times 9{,}8) - 10\,sin\,15^o)$✓= 3a✓
$a = -\ 1{,}51712 m.s^{-2}$
$v_f{}^2 = v_i{}^2 + 2a\Delta x$✓
$0 = v_i{}^2 + 2(-1{,}51712)4$✓
$v = 3{,}48\,m.s^{-1}$ ✓$(right/regs)$

Marking criteria for choosing right as positive/*Nasien kritiria as regs as positief gekies word*

- **1 mark for/*punt vir* :**

$0{,}53(3(9{,}8) - 10sin15)$

- **1 mark for/*punt vir*:**

$10\cos 15\ and/en\ 3a$

- **1 mark for/*punt vir*:**

$v_f{}^2 = v_i{}^2 + 2a\Delta x$

- **1 mark for/*punt vir*:**

$0 = v_i{}^2 + 2(-1{,}51712)4$

- **1 mark for/*punt vir*:**

$v = 3{,}48 m.s^{-1}$(right/*regs*)

(5)

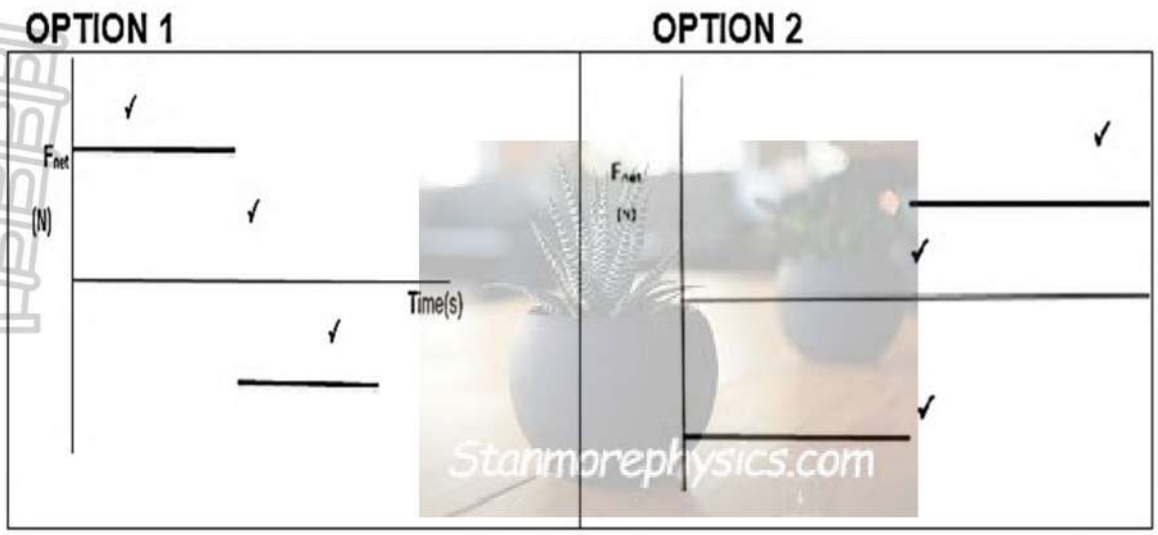
OPTION 2/*OPSIE 2*

$W_{net} = \Delta E_k$
$Fx\Delta xcos\theta + fk\Delta xcos\theta = \frac{1}{2}mv_f{}^2 - \frac{1}{2}mv_i{}^2$ ✓

$10cos15(10)cos0$✓ $+ (14{,}210)(10)cos180$✓ $= \frac{1}{2}(1{,}5)(0)^2 - \frac{1}{2}(1{,}5)v_i{}^2$✓
$v_1 = 3{,}48\,m.s^{-1}$✓

2.3 Increase ✓/*Toeneem*
The resultant force will increase/acceleration will increase causing the velocity to also increase. ✓ / *Die resulterende krag sal toeneem/versnelling sal toeneem, wat veroorsaak dat die snelheid ook toeneem.* (2)

2.4



Marking criteria for choosing right as positive/*Nasien kriteria as regs as positief gekies word*
• 1 mark for the line parallel to the x- axis and intersecting with the y axis in the first quadrant/*1 punt vir die lyn parallel aan die x-as en sny met die y-as in die eerste kwadrant*
• 1 mark for the line parallel to the x axis in the fourth quadrant/ *1 punt vir die lyn parallel aan die x-as in die vierde kwadrant*
• 1 mark for the time of change in direction of the net force/ *1 punt vir die tyd van verandering in rigting van die netto krag.*
Note: Two parallel lines in the fourth and the first quadrant both intersecting with the y axis (2/3)/ *Let wel: Twee parallelle lyne in die vierde en die eerste kwadrant wat albei met die y-as sny (2/3)* **Do not penalize if there is a line joining both graphs/*moenie penaliseer as daar 'n lyn is wat die twee grafieke verbind nie***

(3)
[13]

QUESTION/*VRAAG* 3

3.1 When object A exerts a force on object B, object B simultaneously exert an oppositely directed force of equal magnitude on object A✓✓ */Wanneer voorwerp A 'n krag op voorwerp B uitoefen, oefen voorwerp B gelyktydig 'n teenoorgestelde gerigte krag van gelyke grootte op voorwerp A uit*

OR/OF

In an isolated system the total linear momentum is conserved/ *In 'n geïsoleerde stelsel word die totale lineêre momentum bewaar*

OR/*OF*

The net (or resultant) force acting on an object is equal to the rate of change of momentum of the object in the direction of the net force./ *Die netto (of resulterende) krag wat op 'n voorwerp inwerk is gelyk aan die tempo van verandering van momentum van die voorwerp in die rigting van die netto krag.* (2 or 0)

3.2 Because the direction of resultant force/acceleration is the same as the direction of motion. ✓*/ Omdat die rigting van resulterende krag/versnelling dieselfde is as die rigting van beweging.* (1)

3.3 $F_{net}\,\Delta t = mv_f - mv_i$ ✓
$F_{net}\Delta t = \Delta p$

$F_{net}\Delta t = 5(2,5) - 5(1,5)$ ✓

$F_{net}\Delta t = 5\text{ N.s right}/regs$ ✓ (3)

3.4
$\sum p_i = \sum p_f$
$mv_{ix} + mv_{iy} = mv_{fx} + mv_{fy}$ ✓

$2(3) + 5(1,5)$✓ $= 2v_{fx} + 5(2,5)$✓
$v_{fx} = 0,5\ m.s^{-1}$ ✓**(direction not considered)**

OPTION 2
For 2kg

$\Delta p = m(v_f - v_i)$ ✓
-5✓ $= 2(v_f - 3)$✓
$v_f = 0,5\ m.s^{-1}$✓

(4)
[10]

QUESTION/*VRAAG* 4

4.1 The motion during which the only force acting on an object is the gravitational force. ✓✓/ *Die beweging waartydens die enigste krag wat op 'n voorwerp inwerk, die gravitasiekrag is* (2 or 0)

4.2 **OPTION 1**

$v_f^2 = v_i^2 + 2a\Delta x$ or/*of* $v_f^2 = v_i^2 + 2a\Delta y$✓

0✓ $= v_i^2 + 2(-9{,}8)(7)$ ✓

$v_i = 11{,}71\ m.s^{-1}$✓ $(upwards/up)$/(*boontoe/op)*

OPTION 2

$v_f^2 = v_i^2 + 2a\Delta x$ or $v_f^2 = v_i^2 + 2a\Delta y$✓

0✓ $= v_i^2 + 2(9{,}8)(-7)$ ✓

$v_i = 11{,}71\ m.s^{-1}(upwards/up)$✓

OPTION 3

$v_f^2 = v_i^2 + 2a\Delta x$ or $v_f^2 = v_i^2 + 2a\Delta y$✓

$v_f^2 = 0$✓ $+ 2(9{,}8)(7)$ ✓

$v_i = v_f = 11{,}71\ m.s^{-1}(upwards/up)$✓ (4)

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4.3.1 **Positive marking from 4.2/*Positiewe nasien vanaf 4.2***

OPTION 1/*OPSIE 1*

$E_{k(\ hit\ the\ ground/\ )} = E_{k(that\ it\ bounce\ )} + E_{k(\ converted\ to\ othe\ \ energies)}$

$\frac{1}{2}mv_{(hit)}^2$✓ $= \frac{1}{2}mv_{(bounce)}^2 + \frac{1}{2}mv_{(convert)}^2$

$\frac{1}{2}(1{,}5)v_{(hit)}^2 = \frac{1}{2}(1{,}5)(11{,}71)^2$✓ $+ 344{,}1$✓

$v_{(hit)} = 24{,}41\ m.s^{-1}$✓$(downwards)$ /(*afwaarts)*

OPTION 2/*OPSIE 2*

$\Delta E_K = E_{kf} - E_{ki}$✓

$-344{,}1$✓ $= \frac{1}{2}(1{,}5)(11.71)^2$✓ $- \frac{1}{2}(1.5)v^2$

$v = 24.41m.s^{-1}$✓(downward) (4)

4.3.2 **Positive marking from 4.3.1/*Positiewe nasien vanaf 4.3.1***

$v_f = v_i + at$✓

$24{,}41 = 12 + (9{,}8)t$✓

$t = 1{,}27s$✓ (3)

[13]

QUESTION/*VRAAG* 5

5.1.1 A ✓and/*en* B✓ (2)

5.1.2 C ✓ (1)

5.2.1 3-chloro✓hexane ✓/*3-chloroheksaan*

Marking criteria/*Nasien kriteria*
• 1 mark for 3-chloro/*1 punt vir 3-chloro*
• 1 mark for hexane/*1 punt vir heksaan*

(2)

5.2.2 4-methyl✓pentan-2-one✓✓/*4-metielpentaan-2-oon*

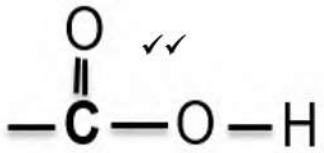
OR/OF

4-methyl✓-2- pentanone✓✓/*4-metiel-2-pentanoon*

Marking criteria/Nasien kriteria
• 1 mark for 4-methyl/*1 punt vir 4-metiel*
• 1 mark for pentanone/*1 punt vir pentaanoon*
• 1 mark for whole name correct/*1 punt vir die hele naam korrek*

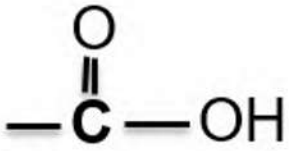
(3)

5.3



✓✓

ACCEPT/*AANVAAR*



(2)

5.4 C_nH_{2n} ✓ (1)

5.5.1 Sulphuric acid ✓ (No mark for H_2SO_4)/ *Swaelsuur (geen punt vir H_2SO_4 nie)* (concentrated removed/*gekonsentreerd uitgelaat)* (1)

5.5.2 Exothermic ✓/*Eksotermies* (1)

[13]

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QUESTION/*VRAAG* 6

6.1 The temperature at which the vapour pressure of the substance is equal to the atmospheric pressure. ✓✓/ *Die temperatuur waarby die dampdruk van die stof gelyk is aan die atmosferiese druk.* (2 or 0)

6.2.1 D and E are Aldehydes ✓ / D en E is *Aldehiede*

OR/*OF*

D is an Aldehyde and E a Ketone/ *of D is 'n Aldehied en E 'n Ketoon* (1)

6.2.2 London force/ induced dipole force/dipole-dipole ✓/*London krag/geïnduseerde dipool krag/dipool-dipool* (1)

6.2.3 **Negative marking from 6.2.1/*negatiewe nasien vanaf 6.2.1***

methylpropanal✓✓/*metielpropanaal*

ACCEPT/*AANVAAR*

2-methylpropanal/2-*metielpropanaal*

OR/*OF*

Butanal/*Butanaal*



(2)

6.3

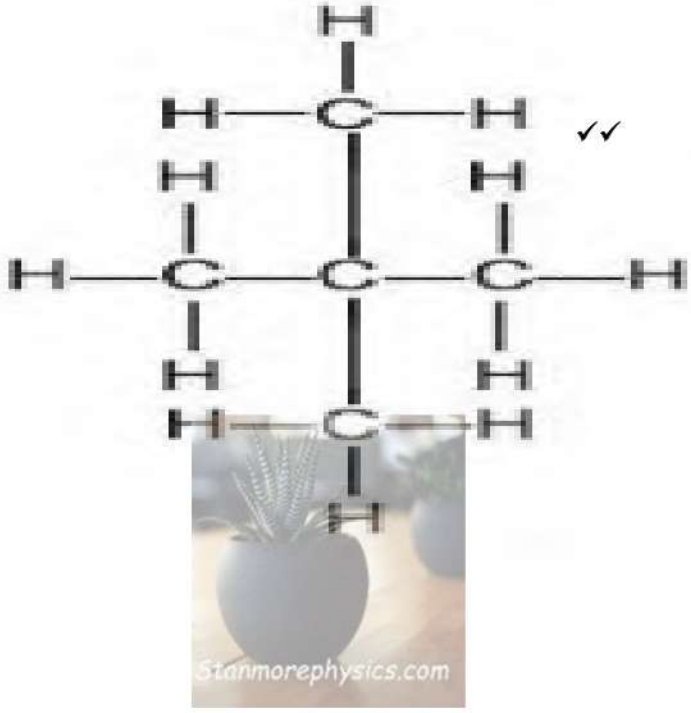
- Compound A has a larger surface area/longer chain length than compound B. ✓/ *Verbinding A het 'n groter oppervlakte/langer kettinglengte as verbinding B*
- Compound A has stronger intermolecular force/London force than compound B. ✓/ *Verbinding A het sterker intermolekulêre krag/Londen-krag as verbinding B*
- More energy is required to overcome the stronger intermolecular force in compound A than compound B ✓/ *Meer energie word benodig om die sterker intermolekulêre krag in verbinding A as verbinding B te oorkom*

Or/*Of*

- Compound B has a smaller surface area/smaller chain length/is more branched than compound A. ✓/ *Verbinding B het 'n kleiner oppervlakte/kleiner kettinglengte/is meer vertak as verbinding A.*
- Compound B has weaker intermolecular force/London force than compound A. ✓/ *Verbinding B het swakker intermolekulêre krag/Londen-krag as verbinding A*

- Less energy is required to overcome the weaker intermolecular force/London force in compound B than in compound A ✓/
  Minder energie word benodig om die swakker intermolekulêre krag/Londen krag in verbinding B te oorkom as in verbinding A (3)

6.4



✓✓

(2)

6.5 C ✓ (1)

[12]

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QUESTION/*VRAAG 7*

7.1.1 Combustion/oxidation ✓/*Verbranding/oksidasie* (1)

7.1.2 Substitution ✓ **ACCEPT:** halogenation/chlorination/
Substitusie ***AANVAAR:*** *halogenasie/chlorinasie* (1)

7.2.1 NaOH / KOH / H_2O / Sodium hydroxide / potassium hydroxide / water
✓/ *Natriumhidroksied / kaliumhidroksied / water* (1)

7.2.2 HCl/ hydrogen chloride ✓/ *waterstofchloried*
(NO MARK FOR HYDROCHLORIC ACID/*GEEN PUNT VIR SOUTSUUR NIE)* (1)

7.3 False✓/*Fals*

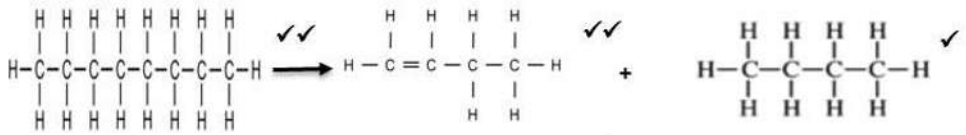
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Compound G and compound C do not have the same molecular formulae / compound G has chlorine while compound C has bromine. ✓/ *Verbinding G en verbinding C het nie dieselfde molekulêre formules nie / verbinding G het chloor terwyl verbinding C broom het* (2)

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7.4 Butan-1-ol✓✓ **ACCEPT** 1-butanol / *butaan-1-ol* ***AANVAAR*** *1-butaanol* (2)

7.5

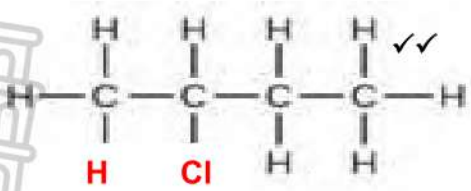


Marking criteria/*Nasien kriteria*

- 2 mark for 8 carbons/*2 punte vir 8 koolstowwe*
- 1 mark for double bonds/*1 punt vir dubbelbindings*
  1 mark for whole structure correct/*1 punt vir hele struktuur korrek*
  If But-2-ene is drawn deduct 1 mark/*as But-2-een geteken trek 1 punt af*
- 1 mark for butane/*1 punt vir butaan*

If molecular formula given/*indien molekulêre formule gegee is*:
C_8H_{18} ✓✓ → C_4H_8 + C_4H_{10} ✓ Max/*maks* 3/5 (5)

7.6

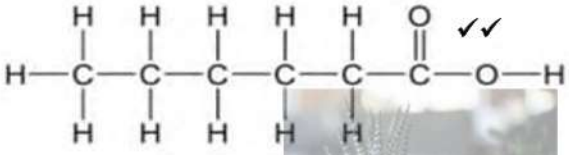


(structure of 2-chlorobutane/*struktuur van 2-chlorobutaan*) (2 or 0)

7.7

- Concentrated strong base/ concentrated NaOH/KOH ✓ */gekonsentreerde sterk basis/gekonsentreerde NaOH/KOH*
- Heat✓/*Hitte* (2)

7.8



- 1 mark for functional group/*1 punt vir funksionele groep*
- 1 mark for whole structure correct/*1 punt vir hele struktuur korrek*

(2)
[19]

TOTAL/*TOTAAL*: 100 – 2
[98]

Rework total of 98 back to 100