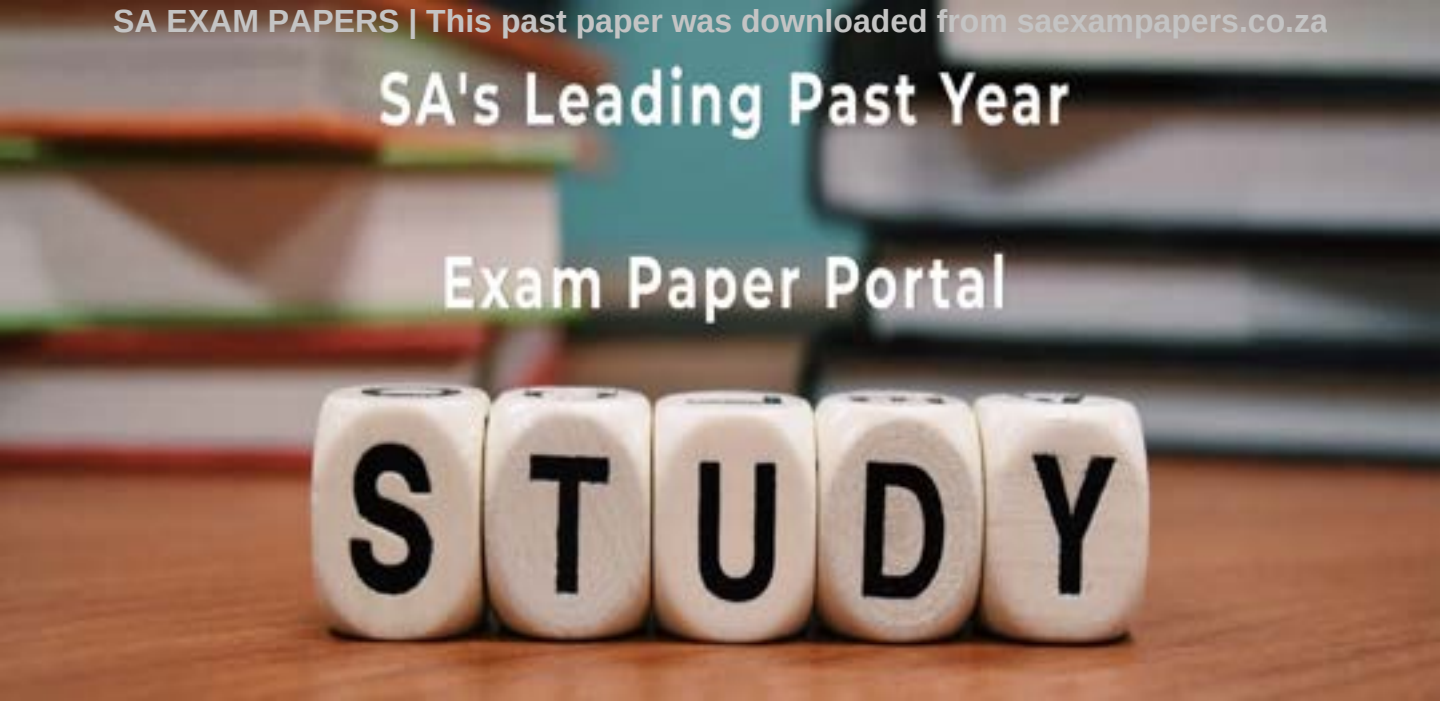


LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF
EDUCATION

NATIONAL

SENIOR CERTIFICATE

GRADE 12

PHYSICAL SCIENCES/*FISIESE WETENSKAPPE*

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

17 March/*Maart* 2025

MARKS/*PUNTE* : 100

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

QUESTION/*VRAAG* 1

1.1 A ✓✓

1.2 D✓✓

1.3 B ✓✓

1.4 B ✓✓

1.5 B✓✓

1.6 B ✓✓

1.7 A ✓✓

1.8 C ✓✓

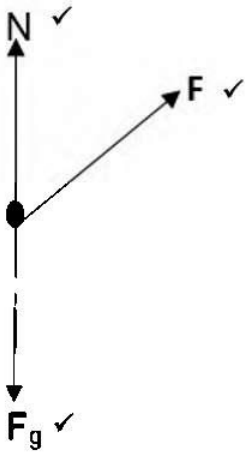
1.9 C✓✓

1.10 A✓✓

[20]

QUESTION/*VRAAG* 2

2.1



ACCEPTABLE LABELS/*AANVAARDE BYSKRIFTE*	**NOTES/*NOTAS***
F_N: Normal/Normaal 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* • There is no dot/*daar is nie 'n kol nie* • Gap between the line and the dot/*spasie tussen die lyne en die kol* • Dotted line is used/*stippellyn word gebruik* • A force diagram is used/*kragtediagram is gebruik*

(3)

2.2 $F_{net} = ma$

$F_x - f_k = ma$

$10\cos 15^o - 0,53(3\times 9,8) - 10\sin 15^o$ ✓= 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*:**

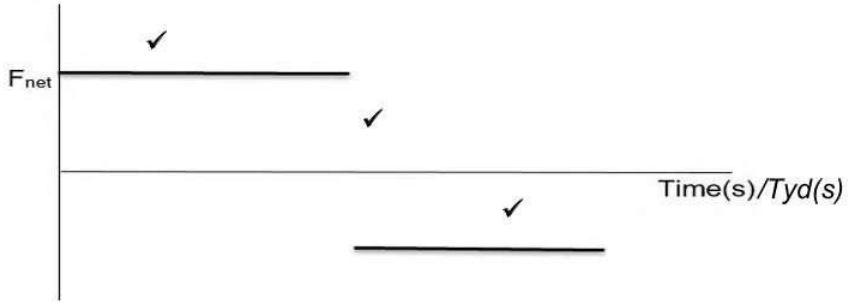
$0 = v_i{}^2 + 2(-1{,}51712)4$

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

$v = 3{,}48m.s^{-1}$(right/*regs*) (5)

2.3 Increase ✓/*Toeneem*
The resultant force will increase/acceleration will increase causing the velocity to also increase. ✓*I 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)*	(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* (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 $F_{net}\,\Delta t = mv_f - mv_i$ ✓
$F_{net}\Delta = \Delta p$

$\Delta p = 5(2,5) - 5(1,5)$ ✓

$\Delta p = 5$ N. s right/*regs* ✓ (3)

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

$2(3) + 5(1,5)✓ = 2v_{fx} + 5(2,5)✓$
$v_{fx} = 0,5\ m.s^{-1}\ right✓$/*regs*

(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 $v_f^2 = v_i^2 + 2g\Delta x$ or $v_f^2 = v_i^2 + 2g\Delta y$✓
0✓ $= v_i^2 + 2(-9{,}8)(7)$ ✓
$v_i = 11{,}71\ m.s^{-1}\ (upwards/up/)$✓/*boontoe/op* (4)

4.3.1 **Positive marking from 4.2/*Positiewe nasien vanaf 4.2***
$E_{k(\ hi\ \ the\ ground/\ )} = E_{k(that\ it\ bounce\ )} + E_{k(\ converted\ to\ othe\ \ energies)}$
$\frac{1}{2}mv^2_{(hi\ )} = \frac{1}{2}mv^2_{(bounce)} + \frac{1}{2}mv^2_{(convert)}$

$\frac{1}{2}(1{,}5)v^2_{(hit)}$✓ $(\mathrm{m.s} - 1 = \frac{1}{2}(1{,}5)(11{,}71)^2$✓ $+344{,}1$✓
$v_{(hit)} = 24{,}41\ m.s^{-1}(downwards)$✓/*(afwaarts)* (4)

4.3.2 **Positive marking from 4.3.1/*Positiewe nasien vanaf 4.3.1***
$v_f = v_i + gt$✓
$24{,}41 = 12 + (9{,}8)t$✓
$t = 1{,}27s$✓ (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*

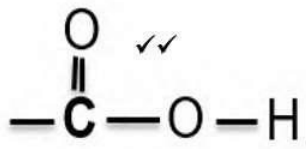
OR/OF

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*

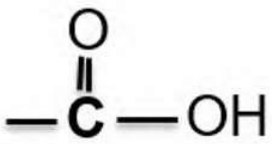
(3)

5.3



✓✓

ACCEPT/*AANVAAR*



(2)

5.4 C_nH_{2n} ✓ (1)

5.5.1 (Concentrated) Sulphuric acid ✓ (No mark for H_2SO_4)/ *(Gekonsentreerde) Swaelsuur (geen punt vir H_2SO_4 nie)* (1)

5.5.2 Endothermic ✓/*Endotermies* (1)

[13]

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 Aldehyde ✓/*Aldehied* (1)

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

6.2.3 methylpropanal✓✓/*metielpropanaal* (2)

ACCEPT/*AANVAAR*

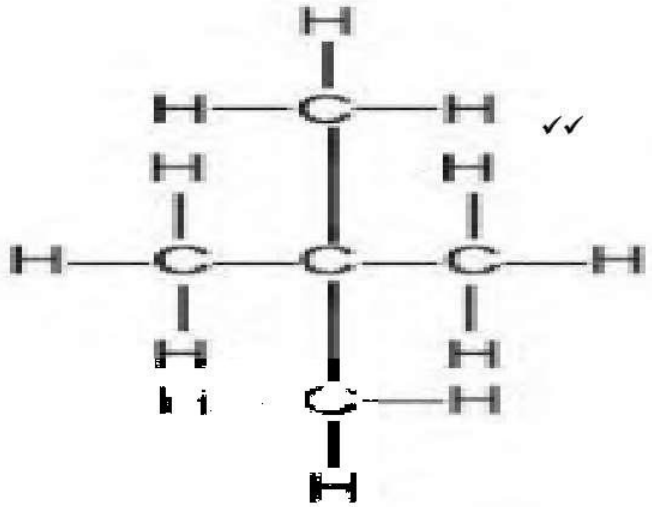
2-methylpropanal/*2-metielpropanaal*

6.3
- Compound A has 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 smaller surface area/smaller chain length than compound A. ✓/ *Verbinding B het 'n kleiner oppervlakte/kleiner kettinglengte as verbinding A.* (3)
- 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*

6.4 (2)



6.5 C ✓ (1)
[12]

QUESTION/*VRAAG 7*

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

7.1.2 Substitution ✓/*Substitusie* (1)

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

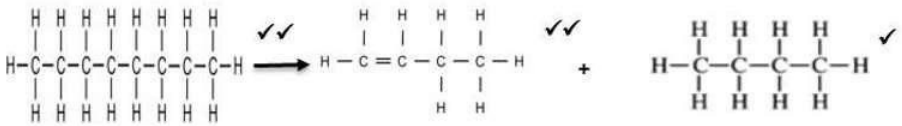
7.2.2 HCl/ hydrogen chloride ✓/ *waterstofchloried* (1)
(NO MARK FOR HYDROCHLORIC ACID/GEEN PUNT VIR SOUTSUUR NIE)

7.3 False✓/*Fals*

\-

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

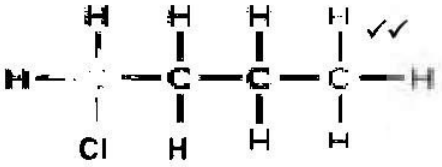
7.4 1-butanol/ butan-1-ol✓✓/*1-butaanol/butaan-1-ol* (2)

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*
- 1 mark for butane/*1 punt vir butaan*

(5)

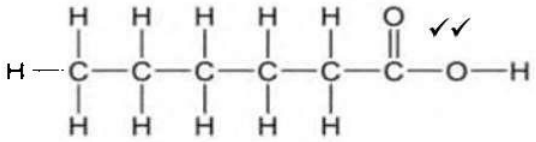
7.6 

(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