basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATIONS/
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SENIORSERTIFIKAAT-EKSAMEN/
NASIONALE SENIORSERTIFIKAAT-EKSAMEN

TECHNICAL SCIENCES P2/*TEGNIESE WETENSKAPPE V2*

MAY/JUNE/*MEI/JUNIE* 2026

MARKING GUIDELINES/*NASIENRIGLYNE*

MARKS/*PUNTE*: 75

These marking guidelines consist of 7 pages./
Hierdie nasienriglyne bestaan uit 7 bladsye.

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QUESTION/*VRAAG* 1

1.1 C ✓✓ (2)

1.2 A ✓✓ (2)

1.3 B ✓✓ (2)

1.4 D ✓✓ (2)

1.5 A ✓✓ (2)

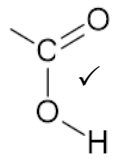
[10]

QUESTION/*VRAAG* 2

2.1 A molecule containing carbon atoms. ✓✓ /*'n Molekuul wat koolstofatome bevat.* (2)

2.2 Alcohols ✓/*Alkohole* (1)

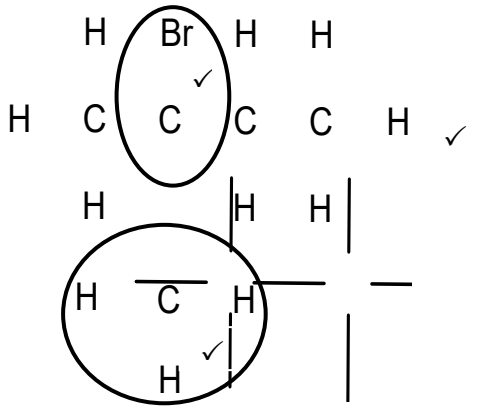
2.3 Formyl (group) ✓/*Formiel(groep)* (1)

2.4 

(1)

2.5 $C_nH_{2n}O$ ✓ (1)

2.6.1 2-bromopentane ✓ /*2-bromopentaan* (2)

2.6.2 

Marking criteria/*Nasienkriteria*:
- 1 mark for correct functional group/*1 punt vir korrekte funksionele groep*
- 1 mark for alkyl group/*1 punt vir alkielgroep*
- 1 mark for the whole structure correct/*1 punt vir volledige struktuur korrek*

(3)

2.6.3 Organic molecules that have the same molecular formula,✓ but different types of chains.✓ /*Organiese molekule met dieselfde molekulêre formule, maar verskillende tipes kettings.* (2)

[13]

QUESTION/*VRAAG* 3

3.1 A series of organic compounds that can be described by the same general formula ✓and where each member differs from the next by the -CH_2 group. ✓ / *'n Reeks organiese verbindings wat deur dieselfde algemene formule beskryf kan word en waarin die een lid van die volgende verskil met die -CH_2-groep.* (2)

3.2 They contain only single covalent bonds ✓ between carbon atoms. ✓ */Hulle besit slegs enkel kovalente verbindings tussen die koolstofatome.* (2)

3.3.1 68,7 °C ✓ (1)

3.3.2 -1 °C ✓ (1)

3.4.1
- Pentan-1-ol has both hydrogen bonds and London forces/induced dipole forces/dispersion forces, whereas pentane only has London forces/induced dipole forces/dispersion forces.✓/
  Pentaan-1-ol het beide waterstofbindings en London-kragte/geïnduseerde dipoolkragte/dispersiekragte, terwyl pentaan slegs London-kragte/ geïnduseerde dipoolkragte/dispersiekragte het.
- Pentan-1-ol has stronger intermolecular forces than pentane.✓ /*Pentaan-1-ol het sterker intermolekulêre kragte as pentaan.*

  OR/*OF*

  Pentane has weaker intermolecular forces than pentan-1-ol. /*Pentaan het swakker intermolekulêre kragte as pentaan-1-ol.* (2)

3.4.2 Higher than ✓/*Hoër as* (1)
[9]

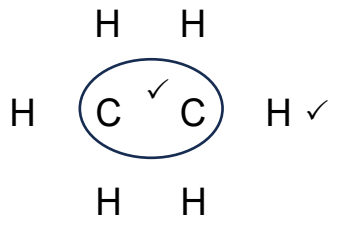
QUESTION/*VRAAG* 4

4.1.1 Combustion ✓/*Verbranding* **OR/*OF*** oxidation/*oksidasie* (1)

4.1.2 Water ✓ /*Water* (1)

4.2.1 Hydrogenation ✓/*Hidrogenering/Hidrogenasie* (1)

4.2.2



Marking criteria/*Nasienkriteria*:
- 1 mark for correct functional group/*1 punt vir korrekte funksionele groep*
- 1 mark for whole structure correct/*1 punt vir volledige struktuur korrek*

(2)

4.2.3 Nickel ✓/Platinum/Palladium / *Nikkel/Platinum/Palladium* (1)

4.3.1 $Br_2(g)$ ✓ (1)

4.3.2 UV light/*UV lig* ✓ **OR/*OF*** Ultraviolet light */Ultraviolet lig* (1)

4.4.1 Small organic molecules that can be covalently bonded to each other ✓ in a repeating pattern. ✓/*Klein organiese molekule wat kovalent aan mekaar gebind kan word in 'n herhalende patroon.* (2)

4.4.2
- (Manufacturing of) squeeze bottles ✓/*(Vervaardiging van) drukbottels*
- Bullet proof vests ✓/*Koeëlvaste baadjies*
- (To make) plastic products/*(Om) plastiekprodukte (te maak)*

(Any correct two/*Enige korrekte twee*) (2)
[12]

QUESTION/*VRAAG* 5

5.1 Material that has electrical conductivity between that of a conductor and an insulator. ✓✓ /*Materiaal met 'n elektriese geleidingsvermoë tussen dié van 'n geleier en 'n isolator.* (2)

5.2

Feature/ *Eienskap*	**Forward bias/ *Meevoorspannend***	**Reverse bias/ *Teenvoorspannend***	
Connection/ *Verbinding*	Anode/p-type connected to positive terminal of battery./ *Anode/p-tipe verbind aan positiewe terminaal van battery.* **OR/*OF*** Cathode/n-type connected to negative negative terminal of battery./ *Katode/n-tipe verbind aan negatiewe terminaal van battery*	Anode/p-type connected to negative terminal of battery./*Anode/p-tipe verbind aan negatiewe terminaal van battery.* **OR/*OF*** Cathode/n-type connected to positive terminal of battery. /*Katode/n-tipe verbind aan positiewe terminaal van battery*	✓
Depletion region/ *Uitputtingsarea*	Narrower/*Nouer*	Wider/*Wyer*	✓
Resistance/ *Weerstand*	Low/*Laag*	High/*Hoog*	✓
Conductivity/ *Geleiding*	Higher (current flow)/*Hoër (stroomvloei)*	Lower (very small diffusion current)./*Laer (baie klein diffusiestroom).*	✓

NOTE/LET WEL: One mark for stating each correct difference./*Een punt vir die stelling van elke korrekte verskil.* (4)
[6]

QUESTION/*VRAAG* 6

6.1 Electrical (energy) to chemical (energy). ✓✓/*Elektriese (energie) na chemiese (energie).* (2)

6.2 $C\ell^-$ ✓ **OR/*OF*** Chloride ion/*Chloriedioon* (1)

6.3 **NEGATIVE MARKING FROM QUESTION 6.2/*NEGATIEWE NASIEN VANAF VRAAG 6.2***
$C\ell^-$(aq) loses electrons/is oxidised✓✓ (to form $C\ell_2$)./*$C\ell^-$(aq) verloor elektrone/ word geoksideer om ($C\ell_2$ te vorm).* (2)

6.4 Intensity of (blue) colour decreases ✓ (as copper forms at the cathode)./ *Intensiteit van (blou) kleur neem af (soos koper vorm by die katode).* (1)

6.5 $Cu^{2+}(aq) + 2e^- \rightarrow Cu(s)$ ✓✓

Marking criteria/*Nasienkriteria*:
$Cu \leftarrow Cu^{2+} + 2e^-$ ($^2/_2$) $Cu^{2+} + 2e^- \rightleftharpoons Cu$ ($^1/_2$)
$Cu \rightleftharpoons Cu^{2+} + 2e^-$ ($^0/_2$) $Cu \rightarrow Cu^{2+} + 2e^-$ ($^0/_2$)
NOTE/LET WEL: *Do not penalise if the phases are omitted./Moenie penaliseer indien fases weggelaat is nie.*

(2)

6.6 $Cu^{2+}(aq) + 2C\ell^-(aq)$ ✓→ $C\ell_2(g)$ + Cu(s) ✓ ✓ bal

Marking criteria/*Nasienkriteria*:
- 1 mark for correct reactants/*1 punt vir korrekte reaktante*
- 1 mark for correct products/*1 punt vir korrekte produkte*
- 1 mark for balancing/*1 punt vir balansering*

NOTE/*LET WEL*: Do not penalise if the phases are omitted./*Moenie penaliseer indien fases weggelaat is nie.*

(3)

6.7
- Noisy while in operation ✓/*Lawaaierig tydens werking*
- Landscapes become unsightly/*Landskappe word onooglik*
- Wind farms disrupt habitats/*Windplase ontwrig habitatte*
- Harmful to wildlife (such as turbines killing birds)/*Skadelik vir wildlewe (soos turbines wat voëls doodmaak)*
- Inconsistent and unpredictable because of fluctuating wind speed/ *Inkonsekwent en onvoorspelbaar as gevolg van wisselende windspoed*

(Any correct one/*Enige korrekte een*) (1)

6.8
- Nuclear (energy) ✓/*Kern(energie)*
- Biodiesel/*Biodiesel*
- Fuel cell/*Brandstofsel*
- Hydroelectric (energy)/*Hidroelektriese (energie)*
- Solar (energy)/*Stralings(energie)*

(Any correct one/*Enige korrekte een*) (1)

[13]

QUESTION/*VRAAG 7*

7.1
- Concentration/*Konsentrasie*: 1 mol·dm^{-3} ✓
- Temperature/*Temperatuur*: 25 °C or 298 K

(Any one/*Enige een*) (1)

7.2 $E^{\theta}_{cell/sel} = E^{\theta}_{cathode/katode} - E^{\theta}_{anode/anode}$
$E^{\theta}_{cell/sel} = E^{\theta}_{reduction/reduksie} - E^{\theta}_{oxidation/oksidasie}$
$E^{\theta}_{cell/sel} = E^{\theta}_{oxidising\ agent/oksideermiddel} - E^{\theta}_{reducing\ agent/reduseermiddel}$ ✓Any one/*Enige een*
$= +0{,}34$ ✓ $- (-0{,}76)$ ✓
$= 1{,}10$ V ✓

Marking criteria/*Nasienkriteria*:
- 1 mark for formula/*1 punt vir formule*
- 1 mark for EACH substitution/*1 punt vir ELKE substitusie*
- 1 mark for answer with unit/*1 punt vir antwoord met eenheid*

(4)

7.3 $Cu^{2+}(aq) + 2e^- \rightarrow Cu(s)$ ✓✓

Marking criteria/*Nasienkriteria*:
$Cu \rightarrow Cu^{2+} + 2e^-$ ($0/2$) $Cu \rightleftharpoons Cu^{2+} + 2e^-$ ($0/2$)
$Cu^{2+} + 2e^- \rightleftharpoons Cu$ ($1/2$) $Cu \leftarrow Cu^{2+} + 2e^-$ ($2/2$)
NOTE/*LET WEL:* *Do not penalise if the phases are omitted./Moenie penaliseer indien fases weggelaat word nie.*

(2)

7.4.1 **Y** ✓ (1)

7.4.2 **NEGATIVE MARKING FROM QUESTION 7.4.1/*NEGATIEWE NASIEN VANAF VRAAG 7.4.1***
- Electrode **Y** is losing electrons.✓✓ /Electrode **Y** is the negative electrode./Electrode **Y** is oxidised. /*Elektrode **Y** verloor elektrone./Elektrode **Y** is die negatiewe elektrode./Elektrode **Y** word geoksideer.*
- Electrons flow from the anode/**Y**/Zink to the cathode/**X**/copper./*Elektrone vloei vanaf die anode/**Y**/Sink na die katode/**X**/koper*.

(Any correct one/*Enige korrekte een*) (2)

7.5
- There will be no movement of ions through the salt bridge. ✓✓ /*Daar sal geen beweging van die ione deur die soutbrug wees nie.*

OR/*OF*

- The neutrality of the electrolytes in the half-cells will not be maintained./*Die neutraliteit van die elektroliete in die halfselle sal nie behou word nie.*

OR/*OF*

- The circuit will be incomplete./*Die stroombaan sal onvolledig wees*.

OR/*OF*

- The net charge of the electrolyte in the half-cells will increase./*Die netto lading van die elektroliet in die halfselle sal toeneem.*

OR/*OF*

- The half-cell reactions will slow down and stop./*Die halfselreaksies sal stadiger word en stop.* (2)

[12]

TOTAL/*TOTAAL*: 75

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