

Section A

Question 1

**1.1**

- 1.1.1 D ✓✓
- 1.1.2 D ✓✓
- 1.1.3 A ✓✓
- 1.1.4 A ✓✓
- 1.1.5 D ✓✓

5 x 2 = 10

**1.2**

- 1.2.1 E ✓✓
- 1.2.2 D ✓✓
- 1.2.3 A ✓✓
- 1.2.4 B ✓✓
- 1.2.5 C ✓✓

5 x 2 = 10

**1.3**

- 1.3.1 Hydrolysis ✓✓
- 1.3.2 Humus/ organic colloid ✓✓
- 1.3.3 Capillarity / Capillary force / Cohesive force ✓✓
- 1.3.4 Soil profile ✓✓
- 1.3.5 Greenhouse / Hothouse / Glasshouse ✓✓

5 x 2 = 10

**Total for Section B =30**

Section B

Question 2

**Soil classes and diameter**

- 2.1 - Sand: ✓ 2mm than 0,05mm ✓ / 10mm – 0.02mm (2)
- Silt: ✓ 0,05mm to 0.002mm ✓ / 0.02mm – 0.002mm (2)
- Clay: ✓ less than 0.002mm ✓ (2)

**2.2 Ways of water loss**

- Run off ✓ (1)
  - Evaporation ✓ (1)
  - Percolation ✓ / Seepage ✓ / Infiltration ✓ / Saturation flow ✓ (1)
  - Transpiration ✓ / Guttation ✓ (1)
- (4)

- 2.3 - Soil texture✓(1)  
 - Soil structure✓ (1)  
 - Organic matter content✓ (1)  
 - Type of clay✓ / type of clay mineral✓ (1)  
 - Pore space✓ / porosity✓ (1)  
 (any 3) (3)
- 2.4 - Micro-pores✓ / Small pores✓ (1)  
 - Macro-pores✓ / Large pores✓ (1)  
 (2)
- 2.5 **Description of soil structure**
- 2.5.1 Platy structure - the peds are flat / structural units are platy✓ (1)  
 - occurs in clay pan soils✓ (1)  
 - permeability is very limited✓ (1)
- 2.5.2 Prism-like structure - aggregates are vertically oriented / vertically longer than they are broad✓ (1)  
 - divided into prismatic and columnar structures. ✓ (1)  
 - occur in subsoil horizon of arid/semi-arid regions✓(1)  
 - prism aggregates have flat tops ✓ (1)  
 - column structures have round tops✓ (1)  
 - can be as long as 15mm or more✓ (1)  
 (any 3)
- 2.5.3 Blocky structure - mostly found in B-horizon✓ (1)  
 - peds look like square cubes / block shaped✓ (1)  
 - sub-angular blocky peds have rounded edges✓ (1)  
 - usually imperfectly shaped✓ (1)  
 - sharp angles and sides. ✓ (1)  
 (any 3 x 1 = 3)  
 (9)

2.6

	<b>Dark coloured soil</b>	<b>Light coloured soil</b>
2.6.1 Heat absorption	usually absorbs and emits more heat ✓(1)	usually absorbs and emits less heat ✓(1)
2.6.2 Day/Night temperature	its day and night temperatures varies more / less ✓(1) <b>OR</b> higher day temperatures because of more absorption of solar energy ✓(1)	its day and night temperature varies less / more ✓(1) <b>OR</b> lower day temperatures because of less absorption of solar energy ✓(1)

(4)

2.7

2.7.1 Old soil / Adult soil ✓ / Mature soil ✓ / Young soil ✓ (1)

2.7.2 B-horizon / C-horizon / E- Horizon / G-horizon / R-horizon ✓ (any 1) (1)

[30]

**Question 3**

3.1 **Soil temperature influence on plant growth and production.**

- Seed germination . ✓ (1)
- Optimal plant growth. ✓ (1)
- Early crops. ✓ (1)
- Better ripening of crops. ✓ (1)
- Less frost damage. ✓ (1)
- More decomposition of organic material. ✓ (1)
- More nutrients dissolved in soil solution. ✓ (1)
- More evaporation. ✓ (1)
- More microbial activity. ✓ (1)

(any 5 x 1 = 5)

3.2 **Functions of oxygen**

- Oxygen is necessary for seed germination. ✓ (1)
- It is necessary for respiration of plant roots and soil microbes./ soil dwellers ✓ (1)
- It is essential for the decay of organic matter in the soil. ✓ (1)

- It prevents formation of poisonous nitrites / substances. ✓ (1)
  - It is essential for soil formation during weathering /chemical processes. ✓ (1)
- (5)

**3.3 Physical influence of organic matter**

- Organic matter improves any soil structure. ✓ (1)
- Organic matter improves drainage and aeration of soil. ✓ (1)
- It improves soil cultivation. ✓ (1)
- Organic matter binds sandy soil / it reduces soil erosion. ✓ (1)
- It improves water infiltration rate. ✓ (1)
- It absorbs more heat and improves soil temperature / soil is warmer / it gives soil dark colour. ✓ (1)
- It reduces compaction / plasticity of clay soil. ✓ (1)
- it improves the ratio between micro and macro pores / it improves porosity of soil. ✓ (1)

(any 5 x 1 = 5)

- 3.4
- a. Identify the major borders of the major/master horizons. ✓ (1)
  - b. Identify the diagnostic horizons. ✓ (1)
  - c. Determine the form name. ✓ (1)
  - d. Identify the characteristics for the soil series / families. ✓ (1)
  - e. Determine the soil series / families name. ✓ (1)
- (5)

**3.5 Characteristics of saline soil**

- Saline soils contain excess concentration of neutral soluble salts. ✓ (1)
- The pH is usually less than 8,5. ✓ (1)
- Water uptake by plants is slow / very high osmotic pressure dominant / water is less accessible to the plant. ✓ (1)
- Sodium ions occupy less than 15% of the cation exchange capacity. ✓ (1)
- Saline soils usually do not have a bad soil structure. ✓ (1)
- White salt precipitate form on the upper parts of the soil. ✓ (1)
- Excess of chlorides of sodium, calcium and magnesium. ✓ (1)
- soil surface turns powdery. ✓ (1)
- Bare patches in the field. ✓ (1)
- Toxic to plants. ✓ (1)

(any 5 x 1 = 5)

- 3.6 - Water seeps into the cracks of the rocks freeze and expand. ✓ (1)  
 - This expansion causes cracks to be opened further and break the rock. ✓ (1)  
**(2)**
- 3.7 - Calcium / Ca<sup>++</sup> ✓ (1)  
 - Magnesium / Mg<sup>++</sup> ✓ (1)  
 - Sodium / Na<sup>+</sup> ✓ (1)  
 - Potassium / K<sup>+</sup> ✓ (1)  
 (any 3) **(3)**

**[30]**

**Question 4**

4.1

- 4.1.1 A. Integument ✓ (1)  
 B. Auxiliary cells ✓ / Synergid cells ✓ (1)  
 C. Ovum / Egg cell ✓ (1)  
 D. Endosperm cell ✓ (1)  
 E. Germ sac ✓ (1)  
 F. Antipodal cell ✓ / Germ sac ✓ (1)  
 G. Umbilicus ✓ navel string ✓ (1)

- 4.1.2 - A or Integument ✓ (1)  
 - Protection of the seed. ✓ (1)

- 4.1.3 It allows water to penetrate to the embryo ✓ (1)  
 during seed germination. ✓ (1)  
 place for the pollon tube to enter ✓ (any 2) (1)  
**(11)**

- 4.2 - Tongue grafting. ✓ (1)  
 - Machine grafting. ✓ / omega / jupiter / Grooved cut (1)  
 - Split grafting. ✓ (1)  
 - Bark grafting

(any 2 x 1 = 2)

- 4.3 - Biological factors / genetic / no pollination. ✓ / to many fruits and flowers /  
 absence of any one sex plant (1)  
 - Soil factors / soil nutrient deficiency / little soil water. / to much water / to

- little nitrogen✓ (1)
- Climatic conditions / low temperature / frost / wind / hail. ✓ (1)
- Spraying of trees / chemicals. ✓ (1)
- (4)
- 4.4 Pollination – it is the transfer of ripe pollen ✓ from the anthers to the receptive stigma✓. (2)
- Fertilisation – it is the union of haploid nucleus / sex cells / gametes of the male and female ✓ to form a diploid zygote ✓ (2)
- 4.5 - Two separate fusions of gametes take place. ✓ (1)
- One male gamete fuses with the ovum. ✓ (1)
- To form a zygote. ✓ (1)
- The other male gamete fuses with the endosperm cell. ✓ (1)
- To form the endosperm (3n). ✓ (1)
- (5)
- 4.6 - To breed a new cultivar / new plant. ✓ / more drought resistance✓ / higher production✓ / better adapted✓ / better quality of the product✓ / faster growth✓ / more resistant to diseases (any 1) (1)
- 4.7 Budding
- It is the transferring of a bud from a budding stem✓ (1)
- To a root stock✓ (1)
- To produce fruit of the same species from different root stocks. ✓ (1)
- Avoid root diseases✓ (any 3) (1)
- [3]

[30]

### Question 5

- 5.1 **Requirements for photosynthesis**
- Light ✓ / Solar radiation✓ / sunlight✓ (1)
- Chlorophyll✓ / green pigment (1)
- Suitable temperature ✓ (1)
- Carbon dioxide✓ (1)
- Water✓ / Moisture content (1)

(5)

5.2 **Functions of water (plants)**

- Water provides mechanical rigidity (turgor) to plant cells. ✓ (1)
- It serves as important solvent. ✓ (1)
- Water is required for the light phase of photosynthesis. involved in biochemical / metabolic reactions ✓ (1)
- It is essential for hydrolysis of stored plant nutrients. ✓ (1)
- It serves as transport medium within the plant. ✓ (1)-
- Water has a cooling and warming (stabilizing) effect on the plant. ✓ (1)

(any 5)

5.3 **Technique of plant propagation**

5.3.1 Trellising system. ✓ (1)

5.3.2 - To increase photosynthesis. ✓ (1)

- To increase light penetration. ✓ / insolation ✓ (1)

- To improve mechanical harvesting. ✓ (1)

- To increase effective penetration of chemicals during spraying. ✓ (1)

- To improve manipulation during summer easier. ✓ (1)

- To increase the production of food. ✓ (1)

(any 1)

5.3.3 - Grapes ✓ (1)

- Tomatoes ✓ (1)

- Beans ✓ (1)

- Granadilla ✓ (1)

- kiwi fruit ✓ (1)

- Hops ✓ (1)

- English cucumber ✓ (1)

- Garden peas ✓ (1)

(3)

5.4 **Functions of potassium in plants**

- Potassium maintains the osmotic balance. ✓ (1)

- It acts as catalyst in a number of reactions in plants. ✓ / activate enzymes (1)

- It allows cytoplasm to remain in a jelly-like condition. ✓ (1)

- encourage root development ✓ (1)

- It improves the quality of crops. ✓ (1)
  - It increases the plant's resistance to drought and diseases. ✓ (1)
  - Cereals stool better✓ (any 5) (1)
- (5)**

**5.5 Detrimental effects of acid soil**

- Lower pH with toxic quantity of aluminium may poison plants. ✓ (1)
  - Phosphate fixing takes place / Phosphorus is very poorly available. ✓ (1)
  - Mineralisation of organic matter occurs slowly. ✓ (1)
  - Solubility of Molybdenum decreases with increasing soil acidity. ✓ (1)
  - The quantity of exchangeable Calcium and Magnesium ions is small. ✓ (1)
  - Activity of soil microbes decreases. ✓ (1)
- (any 5)

**5.6 Absorption of soil minerals**

**5.6.1 Passive ion uptake**

- It takes place by diffusion of minerals. ✓ (1)
- Ions diffuse from high to low concentration levels. ✓ / Ions absorbed along the concentration gradient✓ (1)
- No energy is required. ✓ (1)
- Part of osmotic process✓ (1)
- Ions are smaller than the pores in the membrane✓ (1)

**5.6.2 Active absorption**

- Minerals are absorbed against concentration gradient. ✓ (1)
  - Active absorption requires carrier molecule. ✓ (1)
  - Energy is required. ✓ (1)
  - Ions are bigger than the pores in the membrane✓ (1)
  - ATP provides energy for transport. ✓ (1)
- (7)**

**[30]**

**Total for Section B = 120**

**Grand Total = 150**



**AFDELING A****LANDBOUWETENSKAP SG V1****VRAAG 1****1.1**

- 1.1.1 D ✓✓
- 1.1.2 D ✓✓
- 1.1.3 A ✓✓
- 1.1.4 A ✓✓
- 1.1.5 D ✓✓ (5 x 2) (10)

**1.2**

- 1.2.1 E ✓✓
- 1.2.2 D ✓✓
- 1.2.3 A ✓✓
- 1.2.4 B ✓✓
- 1.2.5 C ✓✓ (2 x 2) (4)

**1.3**

- 1.3.1 Hidrolise ✓✓
- 1.3.2 Humus ✓✓ organiese kolloïed
- 1.3.3 Kapillariteit ✓✓ / Kapillêre kragte ✓✓ / Kohesiekragte ✓✓
- 1.3.4 Grondprofiel ✓✓
- 1.3.5 Kweekhuis ✓✓ / Tonnel ✓✓ / Glashuis ✓✓ (5 x 2) (10)

**TOTAAL AFDELING A: 24****AFDELING B****VRAAG 2: GRONDKUNDE**

- 2.1 **Grondklasse en deursnee**
  - Sand: ✓ 2mm than 0,05mm ✓ / 10mm – 0.02mm (2)
  - Slik: ✓ 0,05mm to 0.002mm ✓ / 0.02mm – 0.002mm (2)
  - Klei: ✓ less than 0.002mm ✓ (2)
- 2.2 **Wyses van waterverlies**
  - Afloop ✓ (1)
  - Verdamping ✓ (1)
  - Deursyfering / Sypeling / Infiltrasie / Perkolasie ✓ (1)
  - Transpirasie ✓ / Gutasie [enige 3] (1)
- 2.3
  - Grondtekstuur ✓ (1)
  - Grondstruktuur ✓ (1)
  - Organiese materiaalinhoud ✓ (1)
  - Tipe klei ✓ / kleimineraal ✓ (1)
- 2.4
  - Mikroporieë ✓ / groot porieë ✓ (1)
  - Makroporieë ✓ / groot porieë ✓ (1)

## 2.5 Beskrywing van grondstruktuur

- 2.5.1 Plaatagtige struktuur - die 'peds' is plat✓/struktuureenhede is plaatagtig ✓ (1)  
 - kom voor in kleipangrond ✓ (1)  
 - deurdringbaarheid is baie beperk ✓ (1)
- 2.5.2 Prisma-agtige struktuur [enige 3]  
 - aggregate is vertikaal gerig/vertikaal langer as wat hulle lank is ✓ (1)  
 - verdeel in prismatiese en kolomstrukture ✓ (1)  
 - kom voor in ondergrondhorisonte van droë/semi-droë streke ✓ (1)  
 - prisma-agtige aggregate het plat bokante✓ (1)  
 - kolomstrukture het ronde bokante ✓ (1)  
 - can so lank as 15 mm of meer (1)  
 (enige 3)
- 2.5.3 Blokagtige struktuur - meesal in B-horisont gevind ✓ (1)  
 - 'peds' lyk soos vierkantige blokke/blokagtige struktuur ✓ (1)  
 - amperhoekige blokagtige 'peds' het geronde rande ✓ (1)  
 - gewoonlik onvolmaak gevorm ✓ (1)  
 - skerp hoeke en kante ✓ (1)

## 2.6

	Donkerkleurige grond	Ligkleurige grond
2.6.1 Hitte-absorpsie	absorbeer en straal gewoonlik meer hitte uit ✓ (1)	absorbeer en straal gewoonlik minder hitte uit ✓ (1)
2.6.2 Dag- en nagtemperatuur	die dag- en nagtemperatuur verskil meer / minder ✓ (1)  <b>OF</b>  hoër dagtemperatuur agv meer absorpsie van sonenergie ✓ (1)	die dag- en nagtemperatuur verskil minder / meer ✓ (1)  <b>OF</b>  laer dagtemperatuur agv minder absorpsie van sonenergie ✓ (1)

(4)

## 2.7

- 2.7.1 Ou grond/Volwasse grond ✓ / Jong grond ✓ (1)
- 2.7.2 B-horisont / E-horisont / C-horisont / G-horisont / R-horisont ✓ [enige 1] (1)

**[30]**

## VRAAG 3: GRONDKUNDE

### 3.1 Invloed van grondtemperatuur op plantegroei en produksie

[enige 5]

- Saadontkieming ✓ (1)
- Optimale plantegroei ✓ (1)
- Vroeë oeste ✓ (1)

- Beter ryppword van oeste ✓ (1)
  - Minder rypskade ✓ (1)
  - Meer ontbinding van organiese materiaal ✓ (1)
  - Meer voedingstowwe wat in grondoplossing oplos ✓ (1)
  - Meer verdamping ✓ (1)
  - Meer mikrobiese aktiwiteit ✓ (1)
- 3.2 Funksies van suurstof**
- Suurstof is nodig vir saadontkieming ✓ (1)
  - Dit is nodig vir respirasie van plantwortels en grondmikrobes / grondbewoners ✓ (1)
  - Dit is noodsaaklik vir die verrotting van organiese materiaal in die grond ✓ (1)
  - Dit voorkom die vorming van giftige nitriete ✓ (1)
  - Dit is noodsaaklik vir grondvorming tydens verwerking / chemiese proses ✓ (1)
- 3.3 Fisiese invloed van organiese materiaal**
- Organiese materiaal verbeter grondstruktuur ✓ (1)
  - Organiese materiaal verbeter dreinerings- en belugting van grond ✓ (1)
  - Dit verbeter grondbewerking ✓ (1)
  - Organiese materiaal bind sanderige grond ✓ (1)
  - Dit verbeter die waterinfiltrasietempo ✓ (1)
  - Dit absorbeer meer hitte en verbeter grondtemperatuur ✓ / grond warmer ✓ / grond donker kleur ✓ (1)
  - Dit verminder verdigting van kleigrond ✓ (1)
  - Dit verbeter die verhouding tussen mikro- en makroporieë ✓ / dit verbeter die porositeit van grond (1)
- (Enige 5)
- 3.4**
- Identifiseer die hoofgrense van die hoofhorisonte ✓ (1)
  - Identifiseer die diagnostiese horisonte ✓ (1)
  - Bepaal die vormnaam ✓ (1)
  - Identifiseer die kenmerke van die series / familienaam ✓ (1)
  - Bepaal die seriesnaam / Familienaam ✓ (1)
- [enige 5]
- 3.5 Kenmerke van saliniteit in grond**
- Soutgrond bevat 'n oormatige konsentrasie van neutrale opgeloste soute ✓ (1)
  - Die pH is gewoonlik minder as 8,5 ✓ (1)
  - Wateropname in plante is stadig / baie hoë osmotiese druk dominant / water minder toeganklik vir die plant ✓ (1)
  - Natriumione beslaan minder ruimte as 15% van die katioonuitruilkapasiteit ✓ (1)
  - Soutgronde het gewoonlik nie 'n slegte grondstruktuur nie ✓ (1)
  - Wit soutneerslag vorm aan die boonste dele van die grond ✓ (1)
  - Oormaat chloriede van natrium, kalsium en magnesium ✓ (1)
  - Grondoppervlakte raak poeieragtig ✓ (1)
  - Kaal gronde in die land ✓ (1)

- Giftig vir plante
- 3.6
- Water sytel in die krake van die rots in, vries en sit uit. ✓ (1)
  - Hierdie uitsetting veroorsaak dat krake verder oopmaak en die rots breek. ✓ (1)
- 3.7
- Kalsium/ $\text{Ca}^{++}$  ✓ (1)
  - Magnesium/ $\text{Mg}^{++}$  ✓ (1)
  - Natrium/ $\text{Na}^+$  ✓ (1)
  - Kalium/ $\text{K}^+$  ✓ [enige 3] (1)
- [30]**

#### VRAAG 4: PLANTREPRODUKSIE

- 4.1
- 4.1.1
- A Integument/Dophuid ✓ (1)
  - B Hulpselle ✓ (1)
  - C Ovum/Eiersel ✓ (1)
  - D Endospermsel ✓ (1)
  - E Kiemsak ✓ (1)
  - F Antipodesel ✓ (1)
  - G Hilum/Nawelstring ✓ (1)
- 4.1.2
- A of Integument ✓ (1)
  - Beskerming van die saad ✓ (1)
- 4.1.3
- Dit laat water toe om die embrio binne te dring ✓ (1)
  - tydens saadontkieming ✓ (1)
- 4.2
- Tongenting ✓ (1)
  - Masjienenting ✓ / omega / jupiter / Kloofenting ✓ (1)
  - Splitenting ✓ (1)
  - Basenting ✓ [enige 2] (1)
- 4.3
- Biologiese faktore/geneties/geen bestuiwing / te veel vrugte en blomme ✓ / afwesigheid van een ven die geslagte ✓ (1)
  - Grondfaktore / grondvoedingstoftekort / min grondwater ✓ / te veel water ✓ / te min stikstof ✓ (1)
  - Klimaatstoestande / lae temperature / ryp / wind / hael ✓ (1)
  - Smit van boeme / chemikalieë ✓ (1)
- 4.4
- Bestuiwing – dit is die oordra van ryp stuifmeel ✓ van die helmknoppe na die ontvangende stempel ✓. (2)
  - Bevrugting – dit is die vereniging van haploïedgamete van die manlike en vroulike ✓ om 'n diploïede sigoot te vorm. ✓ (2)
- 4.5
- Twee aparte samesmeltings van gamete vind plaas ✓ (1)

- Een manlike gameet smelt saam met die eiersel/ovum ✓ (1)  
 Om 'n sigoot te vorm ✓ (1)  
 Die ander manlike gameet smelt saam met die endospermsel ✓ (1)  
 Om die endosperm (3n) te vorm ✓ (1)
- 4.6 Om 'n nuwe kultivar/plant te kweek. ✓ / meer droogtebestand / hoër produksie / beter aanpassing / beter kwaliteit / vinniger groeitempo / meer weerstandbiedend teen siektes (anige 1) (1)
- 4.7 **Okulering**  
 Dit is om 'n oksel/ogjie/knop van 'n knopvormende stam oor te plaas ✓ (1)  
 Op 'n wortelstok/onderstok ✓ (1)  
 Om vrugte van dieselfde spesie van verskillende wortelstokke te produseer ✓ (1)  
 verhoed wortelsiektes (enige 3) (1)
- [30]**

## VRAAG 5: PLANTVOEDING

- 5.1 **Vereistes vir fotosintese**
- Lig ✓ / straling / sonlig (1)
  - Chlorofil ✓ / groen pigment / bladgroen (1)
  - Geskikte temperatuur ✓ (1)
  - Koolstofdiksied ✓ (1)
  - Water ✓ / voginhoud (1)
- 5.2 **Funksies van water**
- Water verskaf meganiese stewigheid (turgor) aan plantselle ✓ (1)
  - Dit dien as 'n belangrike oplosmiddel ✓ (1)
  - Water word benodig vir die ligfase van fotosintese / speel 'n rol in biochemiese / metaboliese reaksie ✓ (1)
  - Dit is noodsaaklik vir hidrolise van gestoorde plantvoedingstowwe ✓ (1)
  - Dit dien as vervoermedium binne die plant ✓ (1)
  - Water het 'n verkoelingseffek / stabiliseringseffek op die plant ✓ (1)
- [enige 5]
- 5.3 **Plantproduksietegniek**
- 5.3.1 Tralierankwerk / Ranktraliewerk / opleistelsel ✓ (1)
- 5.3.2 [enige 1]
- Om fotosintese te laat toeneem ✓ (1)
  - Om ligpenetrasie te laat toeneem ✓ (1)
  - Om meganiese oes te verbeter ✓ (1)
  - Om doeltreffende penetrasie van chemikalieë tydens spuitwerk te verhoog ✓ (1)
  - Om manipulasie in die somer te verbeter ✓ (1)
- 5.3.3 [enige 1]
- Druive ✓ (1)
  - Tamaties ✓ (1)
  - Boontjies ✓ (1)

- Grenadillas ✓ (1)
- Kiwivrug ✓ (1)
- Hops ✓ (1)
- Engelse komkommer ✓ (1)
- tuinertjies ✓ (enige 1) (1)

#### 5.4 Funksies van kalium in plante

- Kalium bevat die osmotiese balans ✓ (1)
- Dit dien as 'n katalisator in 'n hele aantal reaksies in plante ✓ aktiveer ensieme (1)
- Dit laat sitoplasma in 'n jellie-agtige toestand bly ✓ (1)
- Bevorder wortelontwikkeling ✓
- Dit verbeter die gehalte van oesgewasse ✓ (1)
- Dit verhoog die plant se weerstand teen droogte en siektes ✓ (1)
- Grane stoel beter ✓ [enige 5] (1)

#### 5.5 Nadelige effekte van suurgrond

- Laer pH met toksiese hoeveelheid aluminium kan plante vergiftig ✓ (1)
- Fosfaatfiksering vind plaas/Fosfor is nie geredelik beskikbaar nie ✓ (1)
- Mineralisering van organiese materiaal vind stadig plaas ✓ (1)
- Oplosbaarheid van molibdeen verlaag met verhoogde grondsuurheid ✓ (1)
- Die aantal uitruilbare kalsium- en magneesiumione is klein ✓ (1)
- Aktiwiteit van grondmikrobes neem af ✓ (1)

#### 5.6

##### 5.6.1 Passiewe ioonopname:

- Dit vind plaas deur diffusie van minerale ✓ (1)
- Ione versprei van hoë na lae konsentrasievlakke ✓ (1)
- Geen energie word benodig nie ✓ (1)
- Deel van die osmotiese proses ✓ (1)
- Ione is kleiner as die porieë in die membraan (1)

##### 5.6.2 Aktiewe ioonopname:

- Minerale word teen konsentrasiegradiënt geabsorbeer ✓ (1)
- Aktiewe absorpsie benodig draermolekule ✓ (1)
- Energie word benodig ✓ (1)
- Ione is groter as die porieë in die membraan (1)
- ATP verskaf energie vir vervoer ✓ (1)

**[30]**

**TOTAAL AFDELING B: 120**  
**GROOTTOTAAL: 144**