

**Afdeling A****Vraag 1****1.1**

- 1.1.1 C ✓✓  
 1.1.2 C ✓✓  
 1.1.3 A ✓✓  
 1.1.4 C ✓✓  
 1.1.5 B ✓✓

**5 x 2 = 10****1.2**

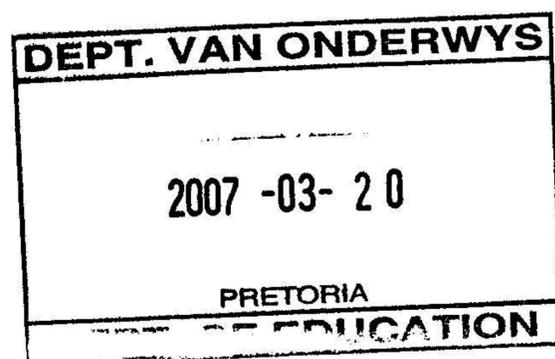
- 1.2.1 G ✓✓  
 1.2.2 H ✓✓  
 1.2.3 E ✓✓  
 1.2.4 B ✓✓  
 1.2.5 A ✓✓

**5 x 2 = 10****1.3**

- 1.3.1 Vorming van grondstruktuur / grondstruktuur ✓✓  
 1.3.2 Klei / Kolloïed / Humus ✓✓  
 1.3.3 Grondklassifikasie ✓✓  
 1.3.4 Veldwaterkapasiteit ✓✓  
 1.4.5 Vrugte ✓✓

**5 x 2 = 10****Totale punte vir Afdeling A = 30****Afdeling B****Vraag 2****2.1**

- 2.1.1 O Horisont ✓  
 2.1.2 A Horisont ✓  
 2.1.3 B Horisont ✓  
 2.1.4 C Horisont ✓  
 2.1.5 R Horisont ✓



(1)

(1)

(1)

(1)

(1)

(5)

**2.2 Grondkleur**

- 2.2.1 - Rooi kleur ✓ (1)
- 2.2.2 - Grys kleur ✓ (1)
- 2.2.3 - Ligte kleur ✓ (1)
- 2.2.4 - Donker kleur ✓ (1)

**(4)**

- 2.3 - Sand ✓ (1)
- Slik ✓ (1)
- Klei ✓ (1)
- Gruis ✓ (1)

(enige 3 x 1 = 3)

**2.4****2.4.1 Klimaat**

- Reënval en temperatuur beïnvloed die verwerking van primêre minerale in die grond. ✓ (1)
- Sekondêre minerale word gevorm wat die grondstruktuur bepaal. ✓ (1)
- Klimaat beïnvloed die vegetasie en humus inhoud van die grond. ✓ (1)

**2.4.2 Plantwortels**

- Wortels dring in die kluite en wat lei tot die vorming van aggregate. ✓ (1)
- Krummerstruktuur vorm. ✓ (1)

**2.4.3 Organiese materiaal**

- Humus bind sandgrond om aggregate te vorm. ✓ (1)

- 2.5 - Grond met 'n helling moet onder 'n gewas gehou word tydens die reënseisoen. ✓ (1)
- Rig kontoerwalle op. ✓ (1)
- Dien organiese materiaal aan die grond toe. ✓ (1)
- Gebruik besproeiing effektief. ✓ (1)

**(4)**

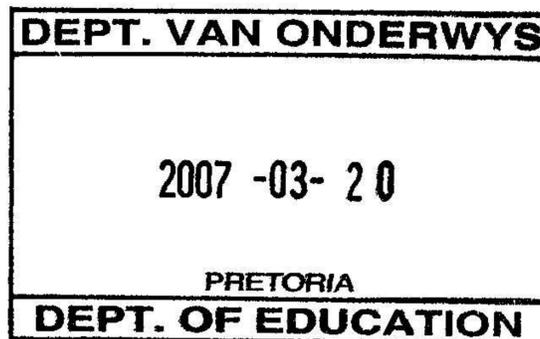
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- 2.6
- 2.6.1 Tydelike verwelking. ✓ (1)
- 2.6.2 - Water wat deur die plantwortels opgeneem word is minder as dit wat deur die blare verlore gaan deur transpirasie ✓ (1)
- Lae grondwatervlakke. ✓ (1)
- (3)
- 2.7 - Makroporieë laat vrye beweging van water toe/Goeie dreinerings. ✓(1)
- Makroporieë laat die vrye beweging van lug toe / Goeie deurlugting. ✓ (1)
- (2)
- 2.8 - Tekstuur ✓ (1)
- Struktuur ✓ (1)
- Organiese materiaalinhoud ✓ (1)
- (3)

[30]

**Vraag 3****3.1 Faktore wat die grondvormingsprosesse beïnvloed**

- Klimaat ✓ (1)
- Moedermateriaal ✓ (1)
- Topografie ✓ (1)
- Vegetasie ✓ (1)
- Tyd / Periode ✓ (1)



- 3.2 - Kalsium ✓ (1)
- Magnesium ✓ (1)
- Kalium ✓ (1)
- Natrium ✓ (1)
- (4)

**3.3 Chemiese eienskappe van organiese materiaal**

- Organiese materiaal is 'n bron van plantvoedingstowwe. ✓ (1)
- Dit verbeter die adsorpsie van katione ✓. (1)
- Minder logging weens 'n hoër Katioon Adsorpsievermoë. ✓ (1)
- Organiese sure wat vorm veroorsaak die verwerking van rotse en minerale. ✓ (1)

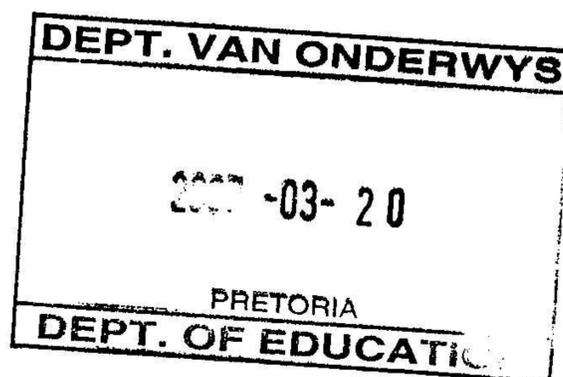
- Grondmikrobes verander proteïen na beskikbare vorms van stikstof vir plante. ✓ (1)
  - (enige 4 x 1 = 4)
  - 3.4 - Hoër meer algemene vlak van onderskeiding. ✓ (1)
  - Laer meer spesifieke onderskeiding. ✓ (1)
  - 3.5 - Sekere organismes gebruik CO<sub>2</sub> as 'n grondstof✓ in die vervaardiging van koolhidrate✓ (2)
  - 'n Sekere deel van die CO<sub>2</sub> los in die grondwater op ✓ om koolsuur te vorm. ✓ (2)
  - 3.6 **Redes vir die klassifikasie van gronde in Suid-Afrika**
    - Grondklassifikasie help met die optimale benutting van 'n land se natuurlike hulpbronne. ✓ (1)
    - Dit word gebruik vir die wetenskaplike beplanning van 'n plaas. ✓ (1)
    - Dit word gebruik vir die ontwikkeling van nuwe streke. ✓ (1)
    - Dit word gebruik vir die waardebeplanning van grond. ✓ (1)
    - Dit bevorder goeie kommunikasie oor die grond. ✓ (1)
    - Dit bevorder goeie verbruik van 'n bepaalde grond. ✓ (1)

**(5)**
  - 3.7 - Grond pH / Basis ewewig✓ (1)
  - Kalk inhoud✓ (1)
  - Organiese materiaal✓ (1)

**(3)**

  - 3.8
    - 3.8.1 Neutraal ✓ (1)
    - 3.8.2 Sterk suur ✓ (1)
    - 3.8.3 Sterk alkalies✓ (1)

**(3)**
- [30]**



**Vraag 4****4.1 Die koringblom**

- 4.1.1 - Tweeslagtig / Eenhuisig ✓ (1)  
 - omdat dit meeldrade, styl en stamper het ✓ (1)
- 4.1.2 A - Vervaardig stuifmeelkorrels ✓ (1)  
 F - Beskerm die blom ✓ (1)
- 4.1.3 - Aar ✓ (1)
- 4.1.4 - blombedekking /Palea/Lemma ✓ (1)  
 - Beskerm die blom ✓ (1)
- 4.1.5 - Styl / Stempel ✓ (1)
- 4.1.6 - Blom is wind ✓ of selfbestuiwend ✓ (2)
- 4.1.7 - Om 'n groter oppervlak te bewerkstellig ✓ vir stuifmeelkorrels wat deur wind vervoer word ✓ (2)

**(12)****4.2**

- 4.2.1 - Ontkiemende stuifmeelkorrel ✓ (1)
- 4.2.2 A Eksien / buitenste wand ✓ (1)  
 B Intien / Binneste wand ✓ (1)  
 C Stuifmeelbuis ✓ (1)  
 D Manlike gamete / Manlike geslagskerne ✓ (1)  
 E Vegetatiewe kern / Buiskern ✓ (1)
- (6)**

**4.3**

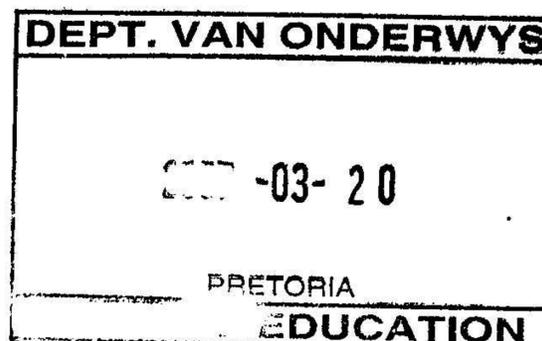
- 4.3.1 - Sultana druiwe ✓ (1)  
 - Navel lemoene ✓ (1)  
 - Piesang ✓ (1)  
 - Eiervrug / Brinjal ✓ (1)

(enige 2 x 1 = 2)

- 4.3.2 Gibberelliene ✓ (1)

**4.3.3 Agente vir kruisbestuiwing**

- Wind ✓ (1)  
 - Water ✓ (1)  
 - Diere / Insekte / Voëls ✓ (1)

**(3)**

- 4.4 Aarbeie – lopers ✓ (1)  
 Lelies – risome ✓ (1)  
 Druwe – steggies ✓ (1)  
**(3)**
- 4.5 - Stuifmeel word nat en kan nie vervoer word nie. ✓ (1)  
 - Stempel kan beskadig word deur wemel van chemikalieë. ✓ (1)  
 - Insekte wat blomme bestuif kan gedood word. ✓ (1)  
**(3)**

**Vraag 5**

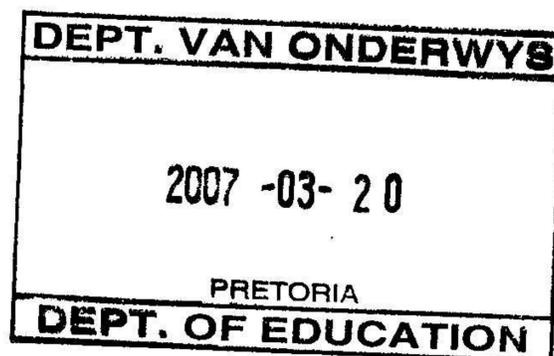
5.1.

- 5.1.1 Eenheidwaarde = Prys per ton  
 % plantvoedingstowwe ✓ (1)
- $$= \frac{R1865.00}{11.3} \quad \checkmark \quad (1)$$
- $$= \underline{R165.00} \quad \checkmark \checkmark \quad (2)$$
- (4)**

- 5.2 - Plaasmis ✓ (1)  
 - Groenbemesting ✓ (1)  
 - Kompos ✓ (1)  
 - Veenmos (1)  
 - Gwano (1)  
 (enige 3) **(3)**

5.3 **Manipulasie van plante vir fotosintese**

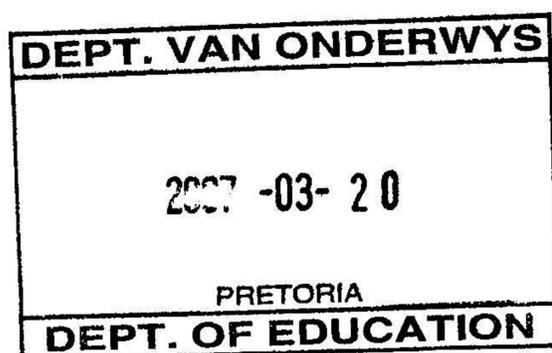
- Opleisisteme ✓ (1)  
 - Snoei / wegbreek van blare ✓ (1)  
 - Plantdigtheid ✓ (1)  
 - Kweekhuis verbouing ✓ (1)  
**(4)**
- 5.4 - Grondreaksie ✓ (1)  
 - Mikrobiese aktiwiteit ✓ (1)  
 - Yster, Aluminium and Mangaan inhoud van die grond ✓ (1)  
**(3)**



- 5.5 - Die soort voer ✓ (1)  
 - Ouderdom van die mis ✓ (1)  
 - Die soort en hoeveelheid strooi wat as beddegoed in hokke gebruik word ✓ (1)  
 - Berging van die mis ✓ (1)  
 - Tipe dier ✓ (1)  
 (enige 4) (4)
- 5.6 **Redes vir die gebruik van vloeibare kunsmis**
- Hoogs gekonsentreerde bemesting kan gebruik word in 'n opgeloste vorm. ✓ (1)  
 - Vloeibare toediening bespaar arbeid. ✓ (1)  
 - Dit is goedkoop want geen addisionele apparaat word benodig nie ✓ (1)  
 - Voedingstowwe bereik die plantwortels dadelik. ✓ (1)  
 - Dit is ideal om te gebruik op gewasse soos suikerriet waar toegang beperk is. ✓ (1)  
 - Chemikalieë om plaë en onkruid te beheer kan by die bemestingmengsels gevoeg word. ✓ (1)  
 - Die akkuraatheid en egaligheid van toediening is baie hoog. ✓ (1)  
 - Effektiwiteit is soortgelyk aan die van vaste kunsmisstowwe. ✓ (1)  
 (enige 5) (5)
- 5.7
- 5.7.1 - Ru fosfaat / Rotsfosfaat ✓ (1)  
 5.7.2 - Kaliumsulfaat ✓ (1)  
 5.7.3 - Dolomitiese kalk ✓ (1)  
 5.7.4 - Kalksteen Ammoniumnitraat ✓ (1)  
 5.7.5 - Kalksteen Ammoniumnitraat / Uruim / Ammoniumsulfaat ✓ (1)  
 (5)
- 5.8 - Suur gronde / Lae pH ✓ (1)  
 - Om die magnesium tot kalsium verhouding reg te stel ✓ (1)  
 (2)
- [30]

Totale Punte Afdeling B = 120

Groototaal = 150



**Section A****Question 1****1.1**

- 1.1.1 C ✓✓  
 1.1.2 C ✓✓  
 1.1.3 A ✓✓  
 1.1.4 C ✓✓  
 1.1.5 B ✓✓

**5 x 2 = 10****1.2**

- 1.2.1 G ✓✓  
 1.2.2 H ✓✓  
 1.2.3 E ✓✓  
 1.2.4 B ✓✓  
 1.2.5 A ✓✓

**5 x 2 = 10****1.3**

- 1.3.1 Structure formation / Soil structure ✓✓  
 1.3.2 Clay / Colloid / ✓✓  
 1.3.3 Soil classification ✓✓  
 1.3.4 Field water capacity ✓✓  
 1.4.5 Fruit ✓✓

**5 x 2 = 10****Total Marks Section A = 30****Section B****Question 2****2.1**

- 2.1.1 O Horizon ✓  
 2.1.2 A Horizon ✓  
 2.1.3 B Horizon ✓  
 2.1.4 C Horizon ✓  
 2.1.5 R Horizon ✓

(1)

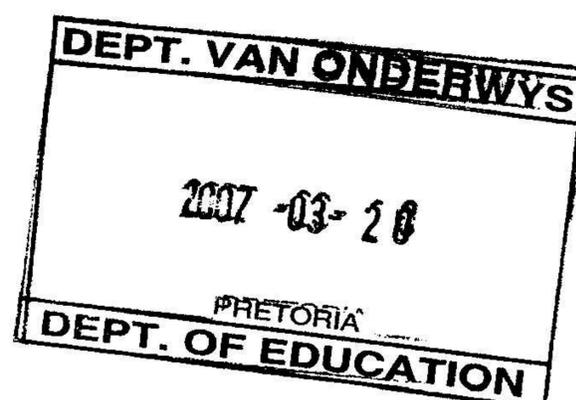
(1)

(1)

(1)

(1)

(5)



**2.2 Soil colours**

- 2.2.1 - Red colour✓ (1)
- 2.2.2 - Grey colour✓ (1)
- 2.2.3 - Light colour✓ (1)
- 2.2.4 - Dark colour✓ (1)
- (4)
- 2.3 - Sand ✓ (1)
- Silt✓ (1)
- Clay ✓ (1)
- Gravel✓ (1)

(any 3 x 1 = 3)

**2.4****2.4.1 Climate**

- Rainfall and temperature influence erosion of primary soil minerals.✓ (1)
- Secondary minerals form and determine soil structure. ✓ (1)
- Climate influences vegetation and humus content of soil. ✓ (1)

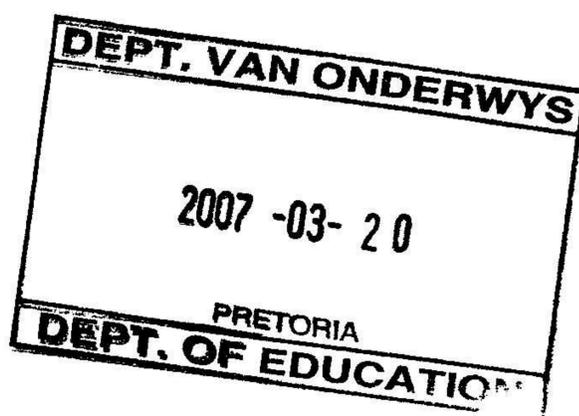
**2.4.2 Plant roots**

- Roots penetrate soil clods into aggregates. ✓ (1)
- Crumb structure forms.✓ (1)

**2.4.3 Organic matter**

- Humus binds sandy soil into aggregates. ✓ (1)

- 2.5 - Sloping soils should be under plant cover in a rainy season. ✓ (1)
- Construct contour walls. ✓ (1)
- Add organic matter into the soil. ✓ (1)
- Use irrigation system efficiently. ✓ (1)
- (4)



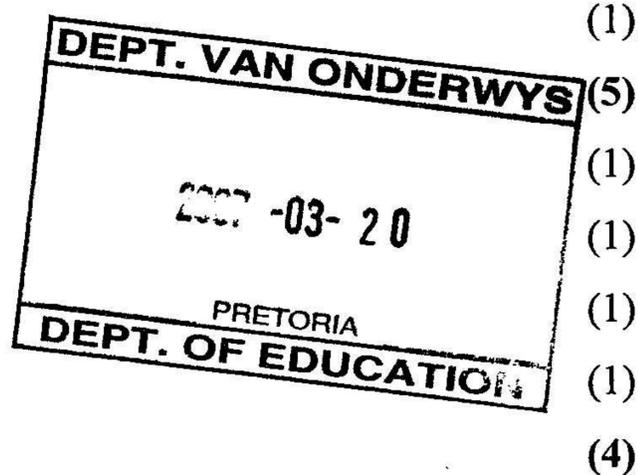
2.6

- 2.6.1 Temporary wilting. ✓ (1)
- 2.6.2 - Water that is absorbed by plant roots is less than that which transpires from the leaves ✓ (1)
- Low soil water levels. ✓ (1)
- (3)
- 2.7 - Macro pores allow free movement of water / Good drainage. ✓ (1)
- Macro pores allow free movement of air / Good aeration. ✓ (1)
- (2)
- 2.8 - Texture ✓ (1)
- Structure ✓ (1)
- Organic matter content ✓ (1)
- (3)
- [30]

**Question 3****3.1 Factors influencing soil forming processes**

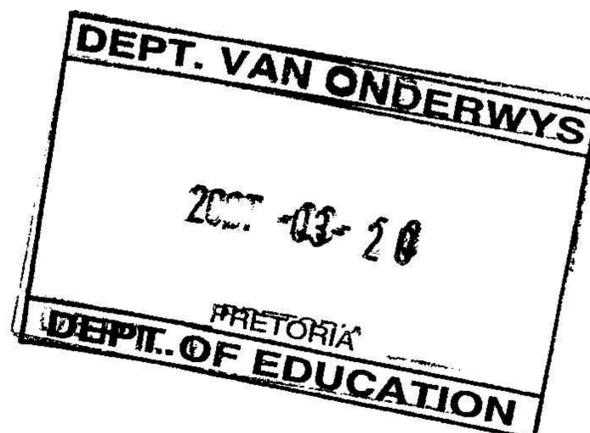
- Climate ✓ (1)
- Parent material ✓ (1)
- Topography ✓ (1)
- Vegetation ✓ (1)
- Time / Period ✓ (1)

- 3.2 - Calcium ✓ (1)
- Magnesium ✓ (1)
- Potassium ✓ (1)
- Sodium ✓ (1)

**3.3 Chemical properties of organic matter**

- Organic matter is a source of plant nutrients. ✓ (1)
- It improves the adsorption of cations ✓. (1)
- Less leaching occurs due to high Cation Adsorption Capacity. ✓ (1)
- Organic acids that are formed causes weathering of rocks and minerals. ✓ (1)

- Soil microbes convert proteins into accessible nitrogen. ✓ (1)  
(any 4 x 1 = 4)
- 3.4 - Higher, more general level of differentiation. ✓ (1)  
- Lower, more detailed differentiation. ✓ (1)
- 3.5 - Some organisms use CO<sub>2</sub> as a source ✓ in the formation of carbohydrates ✓ (2)  
- Some CO<sub>2</sub> dissolves in soil water ✓ to form carbonic acid. ✓ (2)
- 3.6 **Reasons for classifying soil in South Africa**  
- Soil classification helps with optimal utilisation of the country's natural resources. ✓ (1)  
- It is used for the scientific planning of the farm. ✓ (1)  
- It is used for the development of a new region. ✓ (1)  
- It is used for the valuation of soil. ✓ (1)  
- It enables good communication about the soil. ✓ (1)  
- It enables good utilisation of a specific soil. ✓ (1)  
**(5)**
- 3.7 - Soil pH / Base status ✓ (1)  
- Lime content ✓ (1)  
- Organic matter ✓ (1)  
**(3)**
- 3.8  
3.8.1 Neutral ✓ (1)  
3.8.2 Strongly acid ✓ (1)  
3.8.3 Strongly alkaline ✓ (1)  
**(3)**  
**[30]**



**Question 4****4.1 Wheat flower**

- 4.1.1 - Bisexual / Monoecious✓ (1)  
 - because it has anther, style and stigma✓ (1)
- 4.1.2 A - Produces pollen grains✓ (1)  
 F - Protects the flower✓ (1)
- 4.1.3 - Spike✓ (1)
- 4.1.4 - Floral covers/Palea/Lemma ✓ (1)  
 - Protect the flower✓ (1)
- 4.1.5 - Style / Stigma✓ (1)
- 4.1.6 - Flower is wind ✓ or self-pollinated ✓ (2)
- 4.1.7 - To provide a larger surface area ✓ for pollen grains carried by wind✓ (2)
- (12)**

**4.2**

- 4.2.1 - Germinating pollen grain✓ (1)
- 4.2.2 A Exine / Outer wall✓ (1)  
 B Intine / Inner wall✓ (1)  
 C Pollen tube✓ (1)  
 D Male gametes / Male sex nuclei✓ (1)  
 E Vegetative nucleus / Tube nucleus✓ (1)
- (6)**

**4.3**

- 4.3.1 - Sultana grapes✓ (1)  
 - Navel oranges✓ (1)  
 - Banana✓ (1)  
 - Egg fruit / Brinjal✓ (1)
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- (any 2 x 1 = 2)
- 4.3.2 Gibberellins ✓ (1)
- 4.3.3 **Agents of cross-pollination**
- Wind ✓ (1)  
 - Water✓ (1)  
 - Animals / Insects / Birds✓ (1)
- (3)**

- 4.4 Strawberries – runners✓ (1)  
 Lilies – rhizome✓ (1)  
 Grape – cutting/slips✓ (1)  
**(3)**
- 4.5 - Pollen becomes moist and cannot be transported. ✓ (1)  
 - Stigma may be damaged by stream of chemicals. ✓ (1)  
 - Insects, which pollinate flowers, may be killed. ✓ (1)  
**(3)**

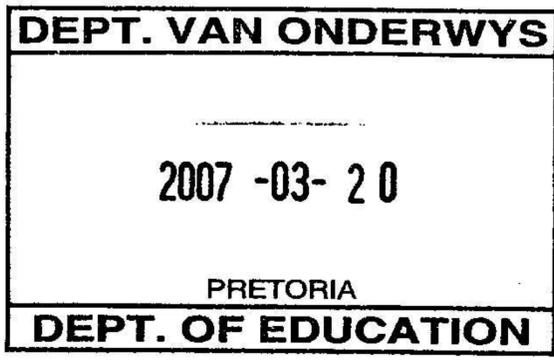
**Question 5**

5.1.

- 5.1.1 Unit value =  $\frac{\text{Price per ton}}{\% \text{ plant nutrient}}$  ✓ (1)  
 $= \frac{R1865.00}{11.3}$  ✓ (1)  
 $= R165.00$  ✓✓ (2)  
**(4)**

- 5.2 - Farm manure✓ (1)  
 - Green manure✓ (1)  
 - Compost✓ (1)  
 - Peat moss (1)  
 - Guano (1)  
 (any 3) **(3)**

- 5.3 **Manipulation of plants for photosynthesis**
- Trellising✓ (1)
  - Pruning / Cutting leaves✓ (1)
  - Plant density ✓ (1)
  - Green housing✓ (1)
- (4)**



- 5.4 - Soil reaction ✓ (1)  
 - Microbial activity✓ (1)  
 - Iron, Aluminium and Manganese content of soil✓ (1)  
**(3)**

- 5.5 - Type of the feed✓ (1)  
 - Age of the manure✓ (1)  
 - Nature and quantity of bedding used✓ (1)  
 - Storing of manure✓ (1)  
 - Type of animal ✓ (1)  
 (any 4) (4)

5.6 **Reasons for using liquid fertilisers**

- Highly concentrated fertilisers can be used in diluted form. ✓ (1)  
 - Liquid application saves labour. ✓ (1)  
 - It is cheap as no extra apparatus is required. ✓ (1)  
 - Nutrients reach the plant roots immediately. ✓ (1)  
 - It is ideal to use in crops with poor access like in sugar cane. ✓ (1)  
 - Chemicals to control pests and weeds can be added to mixture. ✓ (1)  
 - The accuracy and evenness of application are very high. ✓ (1)  
 - Effectiveness is the same as that of solid fertilisers. ✓ (1)  
 (any 5) (5)

5.7

- 5.7.1 - Raw phosphate✓ (1)  
 5.7.2 - Potassium sulphate✓ (1)  
 5.7.3 - Dolomitic lime✓ (1)  
 5.7.4 - Limestone Ammonium Nitrate✓ (1)  
 5.7.5 - Limestone Ammonium Nitrate / Urea / Ammonium sulphate✓ (1)  
 (5)

- 5.8 - Acid soils / Low pH✓ (1)  
 - To correct magnesium and calcium ratio✓ (1)  
 (2)

[30]

**Total Marks Section B = 120**

**Grand Total = 150**

