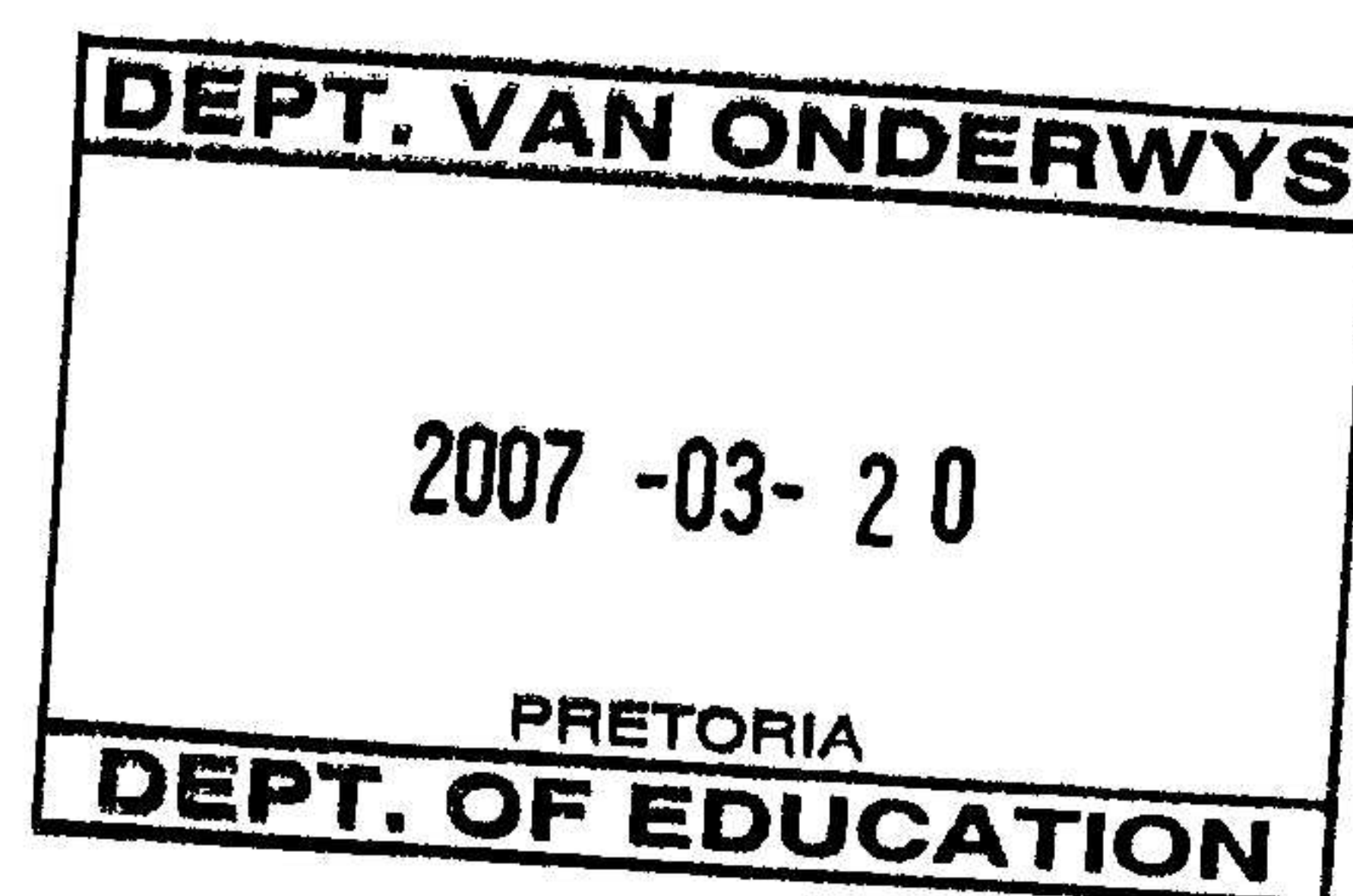


**AFDELING A: VRAAG 1**

|     |        |                      |      |
|-----|--------|----------------------|------|
| 1.1 | 1.1.1  | B✓✓                  | (20) |
|     | 1.1.2  | C✓✓                  |      |
|     | 1.1.3  | C✓✓                  |      |
|     | 1.1.4  | C✓✓                  |      |
|     | 1.1.5  | C✓✓                  |      |
|     | 1.1.6  | C✓✓                  |      |
|     | 1.1.7  | D✓✓                  |      |
|     | 1.1.8  | A✓✓                  |      |
|     | 1.1.9  | C✓✓                  |      |
|     | 1.1.10 | B✓✓                  |      |
| 1.2 | 1.2.1  | E✓✓                  | (10) |
|     | 1.2.2  | D✓✓                  |      |
|     | 1.2.3  | B✓✓                  |      |
|     | 1.2.4  | F✓✓                  |      |
|     | 1.2.5  | G✓✓                  |      |
| 1.3 | 1.3.1  | O-horisont✓✓         | (10) |
|     | 1.3.2  | Klei✓✓               |      |
|     | 1.3.3  | Humus✓✓              |      |
|     | 1.3.4  | Mitose / seldeling✓✓ |      |
|     | 1.3.5  | Breedwerpig ✓✓       |      |
| 1.4 | 1.4.1  | Deflokkulasie ✓✓     | (10) |
|     | 1.4.2  | Groen bemesting ✓✓   |      |
|     | 1.4.3  | Hidrolise ✓✓         |      |
|     | 1.4.4  | Geabsorbeer ✓✓       |      |
|     | 1.4.5  | Die O-horisont ✓✓    |      |

**TOTAAL AFDELING A:****(10)  
50**

**Afdeling B****Vraag 2****2.1 Vorms van waterverlies**

2.1.1 Afloop ✓

2.1.2 Verdamping / Transpirasie ✓

2.1.3 Transpirasie ✓

2.1.4 Afloop / Perkolasie / Verdamping ✓

2.1.5 Verdamping / Afloop / Perkolasie ✓

2.1.6 Transpirasie ✓

|                           |
|---------------------------|
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| 2007 -03- 20              |
| PRETORIA                  |
| <b>DEPT. OF EDUCATION</b> |

(1)

(1)

(1)

(1)

(1)

(1)

**2.2**

|       |                | Klaigrond                                                   | Sandgrond                                                      |
|-------|----------------|-------------------------------------------------------------|----------------------------------------------------------------|
| 2.2.1 | Bewerkbaarheid | Moeilik bewerkbaar (1) ✓<br>Meer smering (1) ✓<br>(Enige 1) | Maklik om te bewerk (1) ✓<br>Minder smering (1) ✓<br>(Enige 1) |
| 2.2.2 | Waterhouvermoë | Hou meer water vir 'n langer tyd (1) ✓                      | Stoor min water vir kort tyd (1) ✓                             |
| 2.2.3 | Deurlugting    | Swak deurlug – meer mikro-porieë (1) ✓                      | Goed deurlug – baie makro-porieë (1) ✓                         |

(6)

2.3 2.3.1 Porieruimte is die ruimtes (spasies) wat bestaan tussen die gronddeeltjies of die totale volume van die makro- en mikro-porieë in die grond. ✓✓

(2)

2.3.2 - Hoe groter die deeltjiegroottes hoe groter is die volume van porieruimtes. ✓

(1)

- Kleiner deeltjies het kleiner ruimtes tussen hulle. ✓

(1)

- Groter deeltjies het groter ruimtes tussen hulle. ✓

(1)

**2.4 2.4.1 Grondtekstuur**

- Waterhouvermoë is groter (hoër) in gronde met fyner tekstuur. ✓

(1)

- Klei en leem gronde het meer mikro-porieë as sandgrond en hou dus meer water. ✓

(1)

- Sandgrond het meer makro-porieë en hou dus minder water. ✓

(1)

**2.4.2 Organiese materiaalinhoud**

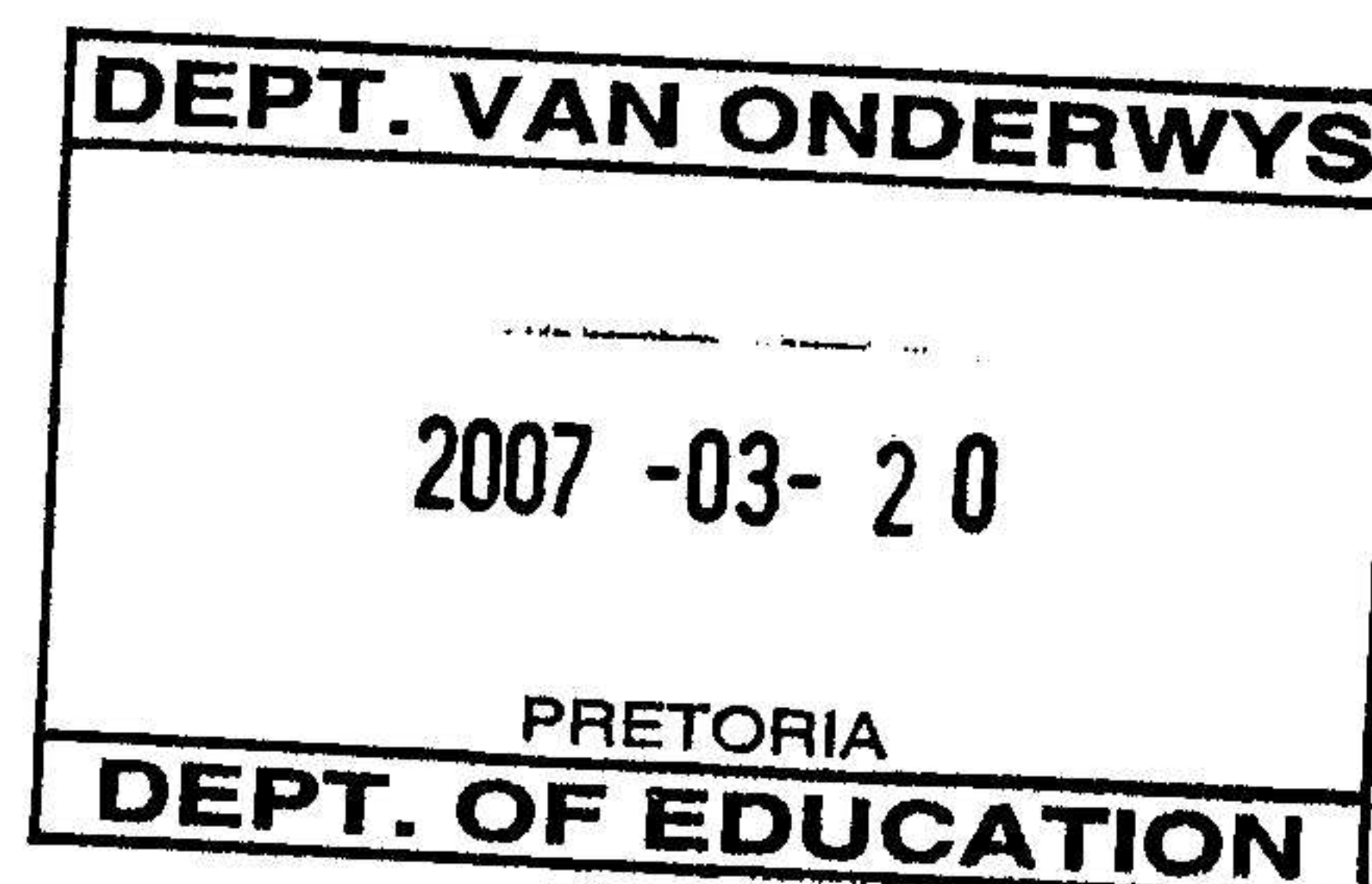
- Waterkapasiteit van gronde neem toe met 'n toename in die hoeveelheid organiese materiaal. ✓ (1)
- Organiese materiaal het die vermoë om water vas te hou soos 'n spons. ✓ (1)
- Organiese materiaal sal die grondstruktuur verbeter. ✓ (1)
- Grondstruktuur sal die hoeveelheid mikro-porieë en waterhouvermoë bepaal. (enige 2) (1)

- 2.5
- Infiltrasietempo ✓ (1)
  - Watervashouvermoë ✓ (1)
  - Deurlugting ✓ (1)
  - Dreinerings ✓ (1)
  - Plant voedingstowwe ✓ (enige 3) (1)

- 2.6
- 2.6.1
- Dominante tekstuur by punt A is **klei**. ✓ (1)
  - Dominante tekstuur by punt C is **slik-leem**. ✓ (1)

- 2.6.2
- By punt A: % klei is 70 ✓ (1)
- % slik is 10 ✓ (1)
- % sand is 20 ✓ (1)
- By punt B: % klei is 20 ✓ (1)
- % slik is 40 ✓ (1)
- % sand is 40 ✓ (1)

- 2.7
- Positief** aan die Waterstofkant ✓ (1)
- Negatief** op die Suurstofkant ✓ (1)

**[35]**

**Vraag 3**

- 3.1 - Oksidasie – is die chemiese proses waar suurstof verbind met minerale om 'n nuwe produk (verbinding) te vorm ✓ (2)
- Reduksie – dit vind plaas onder toestande met lae suurstofvlakke – nat versuipde toestande. ✓ (1)
- Elektrone word oorgedra en gereduseerde elemente se elektronstruktuur verander. ✓ (1)
- 3.2 3.2.1 **Rypskade**
- Wanneer grondtemperatuur baie laag is (winter) kan swaar ryp voorkom. ✓ (1)
- Die voorkoms van ryp tydens die sensitiewe periodes van gewasse veroorsaak skade. ✓ (1)
- Ryp sensitiewe gewasse moet eerder op die noordelike hellings geplant word. ✓ (1)
- Suidelike hellings is meer vatbaar vir ryp. ✓ (enige 2) (1)
- 3.2.2 **Verdamping en transpirasie**
- Meer water gaan verlore deur transpirasie en verdamping as temperatuur hoog is. ✓✓ (2)
- Minder water gaan verlore deur transpirasie en verdamping as die temperatuur laer is. ✓✓ (enige 1) (2)
- 3.2.3 **Vroeë oeste**
- Vir vroeë oeste moet 'n warm sanderige grond op noordelike helling gekies word om die rypwording te verhaas. ✓ (2)
- 3.3 Ladingsdigtheid ✓ (1)
- Dit is die hoeveelheid lading per eenheidsoppervlakte. ✓ (1)
- Die beskikbare oppervlakte sal die aantal katione wat geadsorbeer raak bepaal. ✓ (1)
- Katfoon lading ✓ (1)
- Monovalente katione ( $K^+$ ,  $Na^+$ ) sal nie so sterk adsorbeer word nie. ✓ (1)
- Bivalente katione ( $Mg^{++}$ ,  $Ca^{++}$ ) sal sterker geadsorbeer word. ✓ (1)
- Katfoon grootte ✓ (1)

- Gehidrateerde katione is meer belangrik as die grootte van die kation. ✓ (1)

- Watermolekules rangskik hulself om die katione. ✓ (1)

### 3.4 Grondklassifikasie

- Dit is die verdeling van gronde met dieselfde eienskappe ✓ in groepe ✓ OF die bepaling van die grondvorm ✓ en grondserie. ✓ (2)

3.5 - Illiet ✓ (1)

- Vermikuliet ✓ (1)

- Montmorilloniet ✓ (1)

- Kaolinit ✓ (enige 3) (1)

3.6 - Kalsium ✓ (1)

- Magnesium ✓ (1)

- Kalium ✓ (1)

- Natrium ✓ (1)

3.7 - Grond verskaf ruimte waarin plantwortels anker. ✓ (1)

- Grond verskaf suurstof aan die wortels. ✓ (1)

- Grond verskaf plantvoedingsstowwe. ✓ (1)

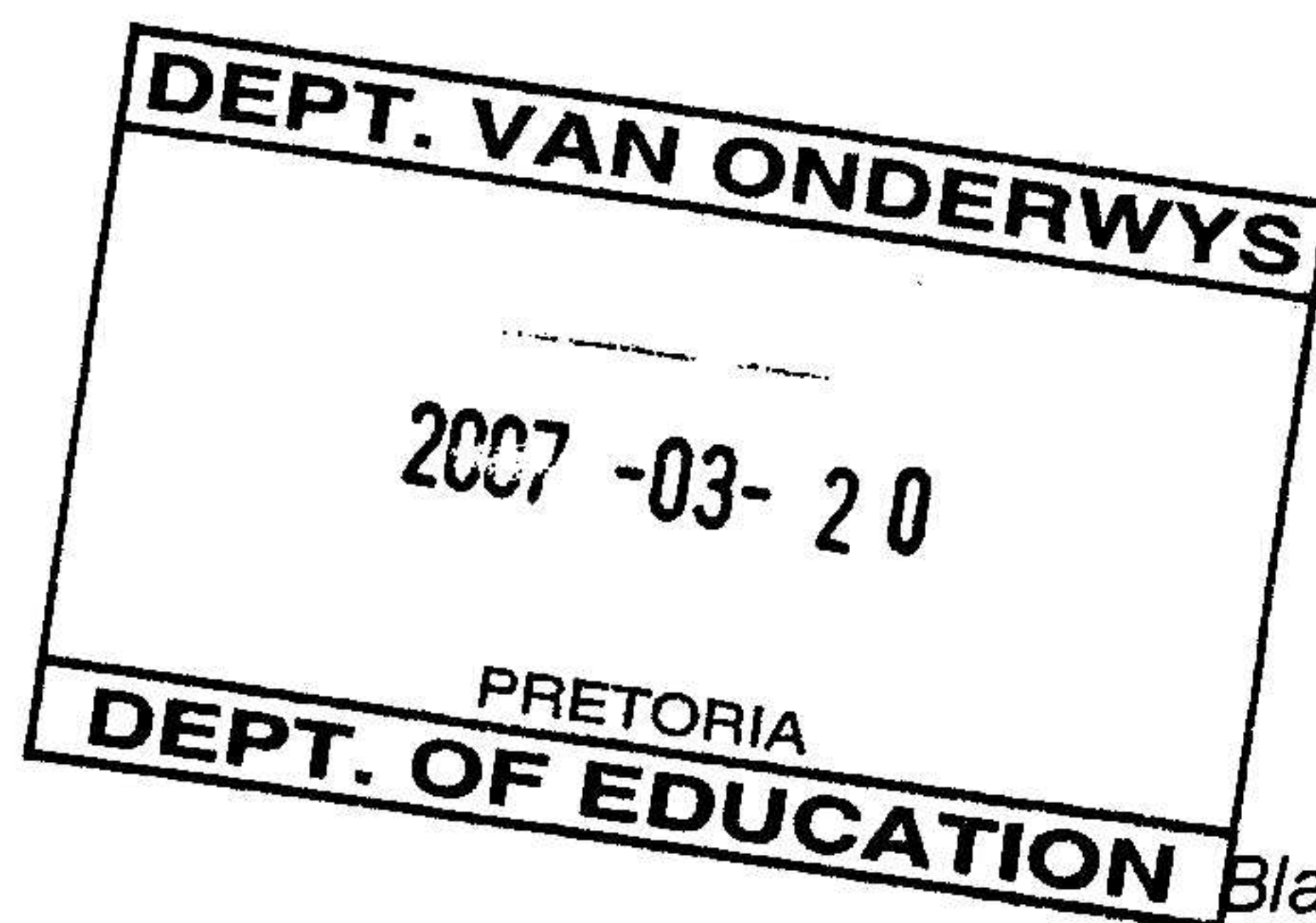
- Grond dien as 'n buffer teen groot temperatuurskommelings. ✓ (1)

- Grond verskaf water aan plante. ✓ (1)

### 3.8 Kation-uitruilkapasiteit

- Dit is die grootte van die lading op kleideeltjies ✓ per eenheid gewig van die grond. ✓ OF maatstaf van die vermoë van die kleideeltjies (kolloïedes) ✓ in die grond om katione te adsorbeer. ✓ (2)

[35]

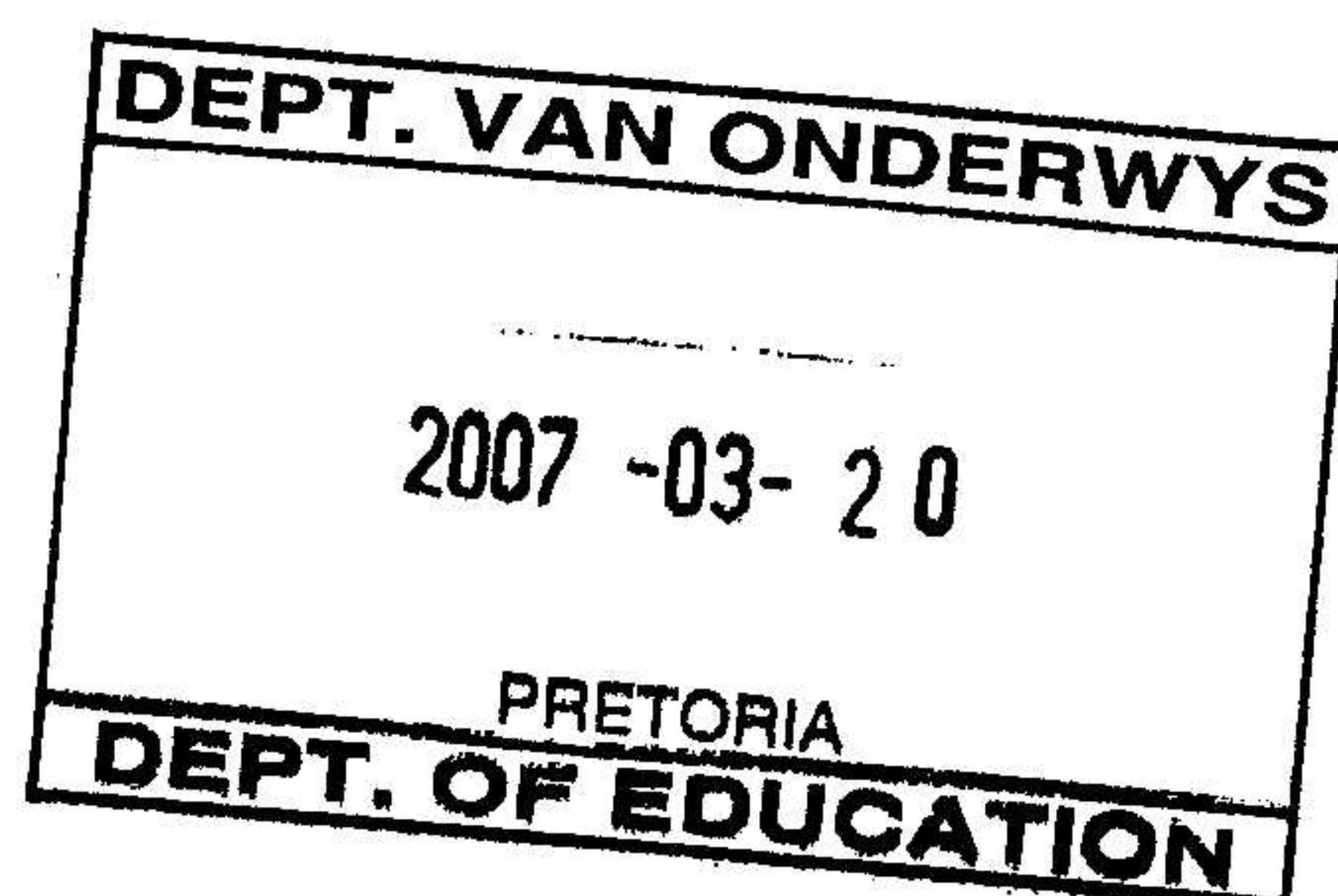


**Vraag 4****4.1 Diagram van die blom**

- 4.1.1      **A. Stui fmeelkorrel** ✓ (1)
- B. Manlike gamete** ✓ (1)
- C. Vegetatiewe kern** ✓ (1)
- D. Integument** ✓ (1)
- F. Ovum/Eiersel** ✓ (1)
- I. Kiemsak** ✓ (1)
- K. Naelstring** ✓ (1)
- 4.1.2      **B. Manlike Gamete**
- Verbind met beide die ovum en kiemwitsel. ✓ (1)
- C. Vegetatiewe kern**
- Beheer die groeirigting van die stui fmeelbuis. ✓ (1)
- 4.1.3      **E. Hulp selle**
- Hulle word afgebreek wanneer die stui fmeelbuis in die kiemsak groei. ✓ (1)
- H. Kiemwit (Endosperm)**
- Dit vorm weefsel wat dien as voedsel vir die ontkiemende embrio (saadjie). ✓ (1)
- 4.1.4      - Die stui fmeelbuis word gevorm en groei na die saadknop. ✓ (1)
- Die groeirigting word beheer deur die vegetatiewe kern. ✓ (1)
- Een manlike gameet versmelt met die ovum om 'n sigoot te vorm. ✓ (1)
- Die ander manlike gameet versmelt met die kiemwitsel ✓ (1)
- Die kiemwit vorm die voedsel vir die ontwikkelende embrio. ✓ (1)

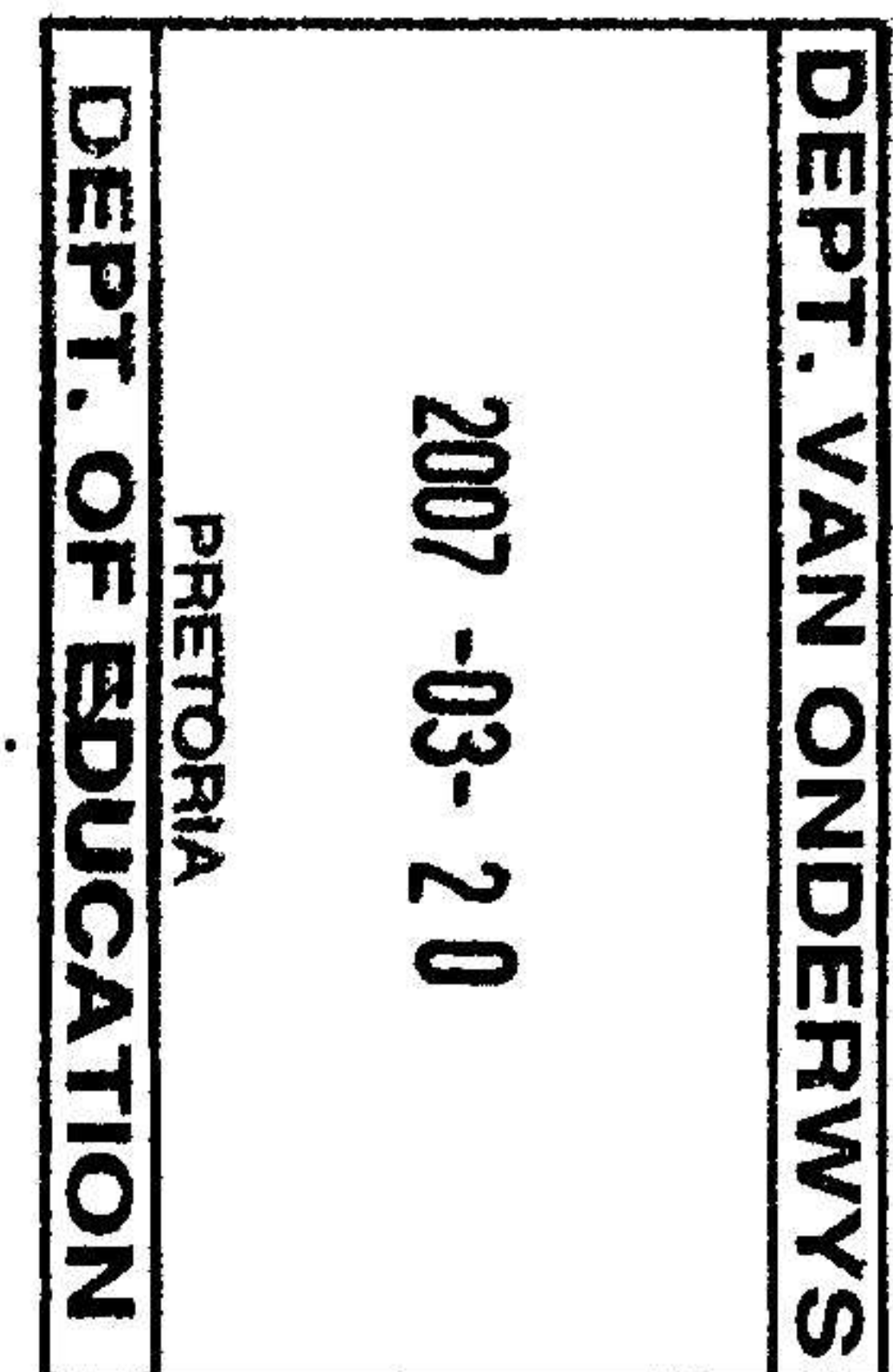
- 4.2 **Stimulatiewe partenokarpie**
- Dit is die ontwikkeling en groei van 'n vrug (vrugset) ✓ met bestuiwing as stimulus maar sonder dat bevrugting plaasvind. ✓ bv. Korrente ✓ (3)
- 4.3
- Helder kroonblare, geur en nektar lok insekte. ✓ (1)
  - Insekte versprei stuifmeel na ander blomme. ✓ (1)
  - Bestuiwing en bevrugting vind plaas in die blom. ✓ (1)
  - Blomme verskaf nektar vir die produksie van heuning. ✓ (1)
  - Stuifmeel word ook gebruik vir die sintese van was. ✓ (1)
- 4.4 **Vrugontwikkeling**
- 4.4.1 'n Byvrug
- Dit ontwikkel van die rypgeworde vrugbeginsel sowel as ander ontwikkelende strukture van die blom. ✓✓ (2)
- 4.4.2 **Veelvoudige vrugte**
- Dit ontwikkel vanaf 'n blom met 'n groot aantal enkelvoudige stampers op dieselfde blombodem (elk van die stampers se vrugbeginsels ontwikkel) om 'n enkele vrug te vorm. ✓✓ (2)
- 4.4.3 **Saamgestelde vrugte**
- Dit ontstaan uit 'n bloeiwyse waar elke blom sy eie vrugbeginsel en saad. ✓ Die blomme ontwikkel en druk teen mekaar om 'n enkele saamgestelde vrug te vorm. ✓ (2)
- 4.5
- Tongenting ✓ (1)
  - Masjienenting ✓ (1)
  - Kloofenting ✓ (1)
- 4.6
- Vrugvorming is die vergroting (swel) van die vrugbeginsel en blomsteel ✓ na die kroonblare afgeval het. ✓ (2)

[35]



**Vraag 5****5.1 Water absorpsie deur plante**

- 5.1.1 A. Water Absorpsie / Voedingstofopname ✓ (1)
- B. Wortelgroei en waterabsorpsie / selverlenging / differensiasie. ✓ (1)
- C. Beskerm die wortelpunt / groei / seldeling ✓ (1)
- 5.1.2 - Osmose ✓ (1)
- 5.1.3 - Water word gebruik om voedingstowwe te vervoer. ✓ (1)
- Afkoeling van die plant. ✓ (1)
- Gee vorm aan die plant (turgor). ✓ (1)
- Dien as oplosmiddel. ✓ (1)
- Belangrik vir chemiese reaksies soos fotosintese. (1)

**5.2 Groenbemesting**

- 5.2.1 Humus. ✓ (1)
- 5.2.2 Peulplante / Eenjarige gewasse. ✓ (1)
- 5.2.3 Hulle beskik oor die vermoë om lugstikstof te bind / Mutualisme. ✓ (1)
- 5.2.4 - Groenbemesting verbeter die grondstruktuur. ✓ (1)
- Verhoog die stikstofinhoud. ✓ (1)
- Dit verminder water en voedingstofverliese uit die grond. ✓ (1)
- Dit verhoog die organiese materiaalinhoud van die grond. ✓ (1)
- Dit voorkom grondverspoeling en gronderosie. ✓ (1)

- 5.3 - Elke geval het optimum tyd vir die neem van plantmonsters. ✓ (1)
- Die beste tyd vir die neem van plantmonsters is vanaf Desember tot Februarie. ✓ (1)
- Noem 'n monster van 10 tot 20 jong, volwasse en gesonde blare uit die sentrale gedeelte van die plant wat verteenwoordigend is van die gewas. ✓ (1)
- Die monster word omtrent skouerhoogte by bome geneem. ✓ (1)

- Pluk die monsters voor 10h00. ✓ (1)

- Moet hulle nie was nie. ✓ (1)

- Sit hulle in 'n skoon plastieksakkie en versend na die laboratorium ✓ (1)

5.4.3 - Dien 1 – 3 ton gips per hektaat toe. ✓ (1)

- Die kalsium van die kalsiumsulfaat verplaas die natrium ione. ✓ (1)

- Die natrium reageer met die sulfaat om natriumsulfaat te vorm. ✓ (1)

- Natriumsulfaat sal maklik uitgeloog word omdat dit baie oplosbaar is. ✓ (1)

- Die logging kan aangehelp word met swaar besproeiings. ✓ (1)

## 5.5 Splitsing van die watermolekuul

- Energie verhoog van molekule in chlorofil na fotone van lig geabsorbeer is. ✓ (1)

- Die energie word gebruik om die watermolekuul in waterstof en suurstof op te breek. ✓ (1)

- Die suurstof word aan die atmosfeer vrygestel. ✓ (1)

- Waterstof word gebruik vir die sintese van koolhidrate. ✓ (enige 3) (1)

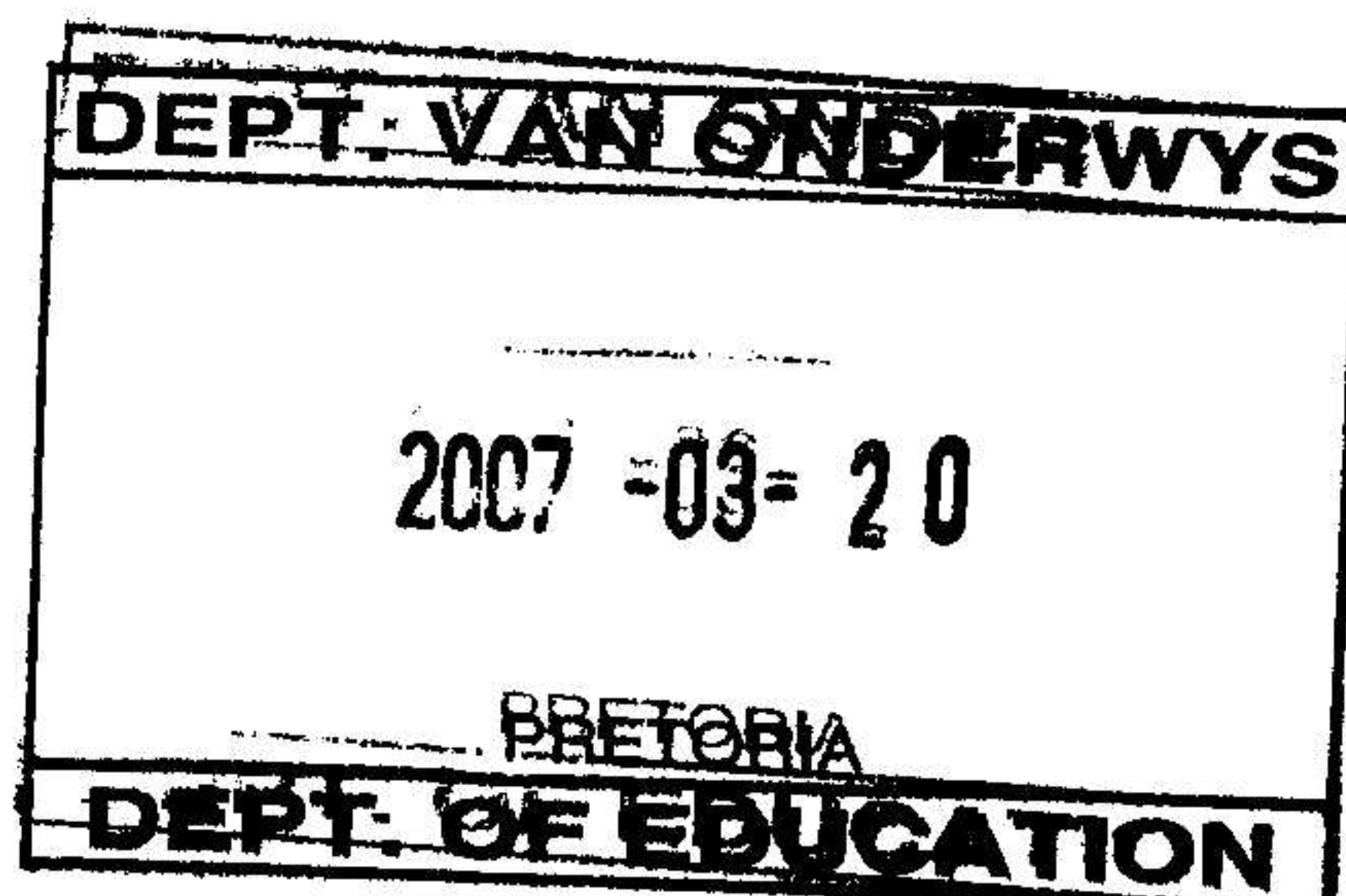
## 5.6 Breedwerpige bemesting

- Dit is eweredige verspreiding van bemesting oor 'n bewerkte area ✓ gewoonlik voor of tydens die plantproses. ✓ (2)

## 5.7 Kalk toediening

*Wanneer* - Voor die reënseisoen / voor planttyd. ✓ (1)

*Hoe* - eweredig versprei oor oppervlakte en / in gewerk in grond deur ploegaksie ✓ (1)



**5.8 Tipes kalk**

- Kalsitiese landboukalk ✓ - 15%  $\text{MgCO}_3$  ✓ (2)
  - 70%  $\text{CaCO}_3$  ✓ (1)
  - Dolomitiese landboukalk ✓ - 20%  $\text{MgCO}_3$  ✓ (2)
  - 80%  $\text{CaCO}_3$  ✓ (1)
- (6)**

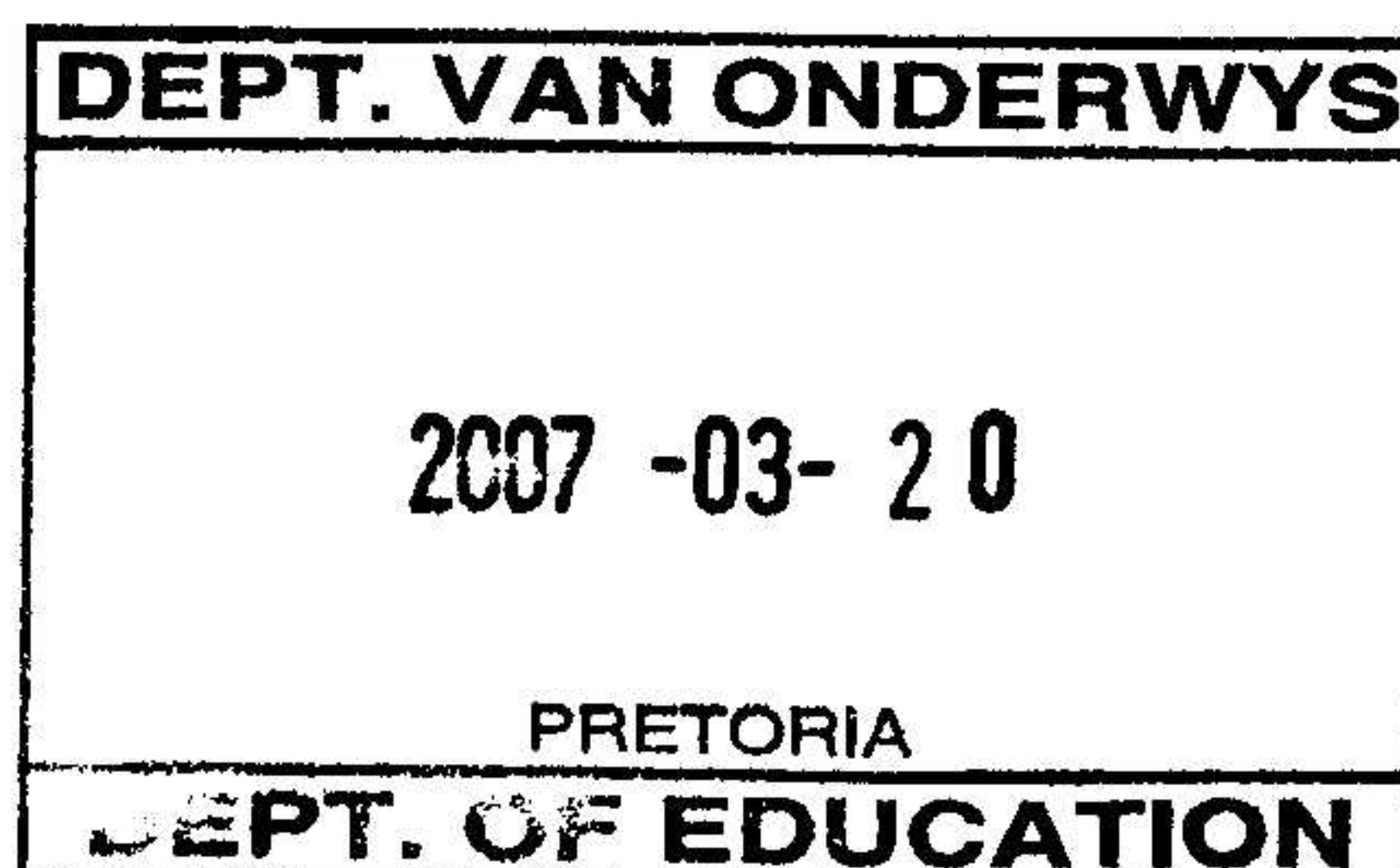
**5.9 Bemesting vir blaartoediening**

- Boraks ✓ (1)
- Natrium molibdaat ✓ (1)
- Ureum ✓ (1)
- Ammoniumsulfaat ✓ (1)
- Kaliumsulfaat ✓ (1)
- Koperchloried ✓ (1)
- Mangaansulfaat ✓ (1)
- Ysterchelaat ✓ (1)

(enige 2 x 1 = 2)

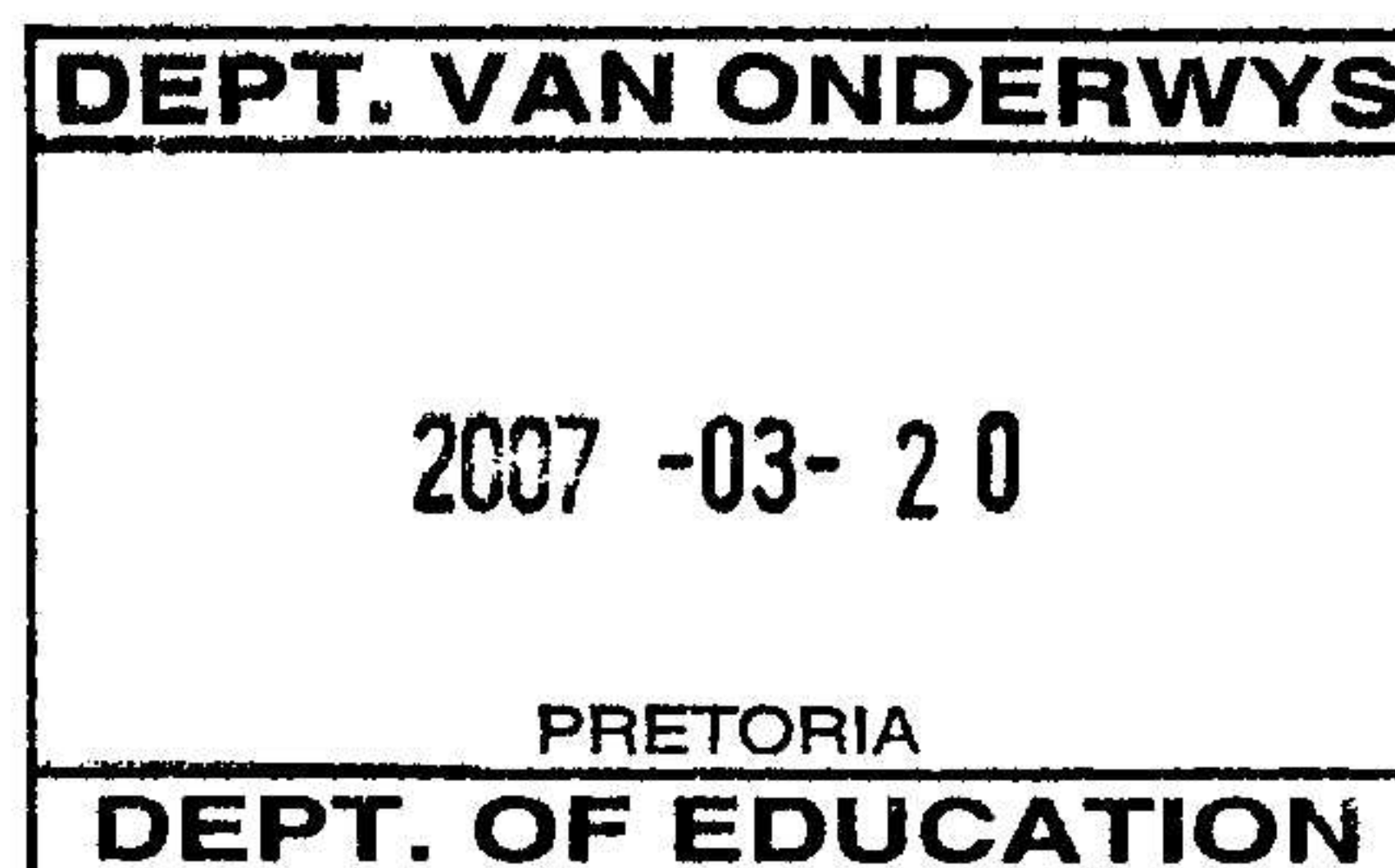
**[45]**

**Totaal Afdeling B = 150**  
**Groottotaal = 200**



**SECTION A: QUESTION 1**

- |     |        |                  |      |
|-----|--------|------------------|------|
| 1.1 | 1.1.1  | B✓✓              |      |
|     | 1.1.2  | C✓✓              |      |
|     | 1.1.3  | C✓✓              |      |
|     | 1.1.4  | C✓✓              |      |
|     | 1.1.5  | C✓✓              |      |
|     | 1.1.6  | C✓✓              |      |
|     | 1.1.7  | D✓✓              |      |
|     | 1.1.8  | A✓✓              |      |
|     | 1.1.9  | C✓✓              |      |
|     | 1.1.10 | B✓✓              | (20) |
| 1.2 | 1.2.1  | E✓✓              |      |
|     | 1.2.2  | D✓✓              |      |
|     | 1.2.3  | B✓✓              |      |
|     | 1.2.4  | F✓✓              |      |
|     | 1.2.5  | G✓✓              | (10) |
| 1.3 | 1.3.1  | O-horizon✓✓      |      |
|     | 1.3.2  | Clay✓✓           |      |
|     | 1.3.3  | Humus✓✓          |      |
|     | 1.3.4  | Mitosis✓✓        |      |
|     | 1.3.5  | Broadcasting✓✓   | (10) |
| 1.4 | 1.4.1  | Deflocculation✓✓ |      |
|     | 1.4.2  | Green manuring✓✓ |      |
|     | 1.4.3  | Hydrolysis✓✓     |      |
|     | 1.4.4  | Adsorbed✓✓       |      |
|     | 1.4.5  | The O-horizon✓✓  |      |



**Total Section A:** (10)  
**50**

**Section B:****Question 2**

- 2.1.2 Evaporation / Transpiration✓ (1)
- 2.1.3 Transpiration✓ (1)
- 2.1.4 Run-off / Percolation / Evaporation✓ (1)
- 2.1.5 Evaporation / Run-off / Percolation✓ (1)
- 2.1.6 Transpiration✓ (1)

**2.2**

|       |                 | Clay soil                                                         | Sandy soil                                               |
|-------|-----------------|-------------------------------------------------------------------|----------------------------------------------------------|
| 2.2.1 | Tillability     | Cultivation is difficult (1) ✓<br>Soil is sticky (1) ✓<br>(Any 1) | Easy to cultivate(1) ✓<br>not so sticky (1) ✓<br>(Any 1) |
| 2.2.2 | Water retention | Keep more water for a longer time (1) ✓                           | Keeps less water for a short time(1) ✓                   |
| 2.2.3 | Aeration        | Weak aeration - more micro-pores (1) ✓                            | Better aeration - many macro-pores (1) ✓                 |

(6)

- 2.3 2.3.1 Soil pore space is the space that exists between soil particles or the total volume of the macro and the micro pores in the soil.✓✓ (2)
- 2.3.2 - The larger the particle size the greater the volume of pore space. ✓ (1)
- Smaller particle sizes have smaller spaces in between. ✓ (1)
- Larger particle sizes have more spaces in between. ✓ (1)
- 2.4 2.4.1 **Soil texture**
- Water retention is high in soils with finer texture. ✓ (1)
- Clay and loam soils have more micro pores and hold more water. ✓ (1)
- Sandy soil has more macro pores and retains less water. ✓ (1)

### 2.4.2 Organic matter content

- Water holding capacity of soil increases with an increase in its organic matter content. ✓ (1)
- Like a sponge organic matter has the ability to retain water. ✓ (1)
- Organic matter will improve soil structure. ✓ (1)
- Soil structure will determine the quantity of micro pores and water retention ✓ (any 2) (1)

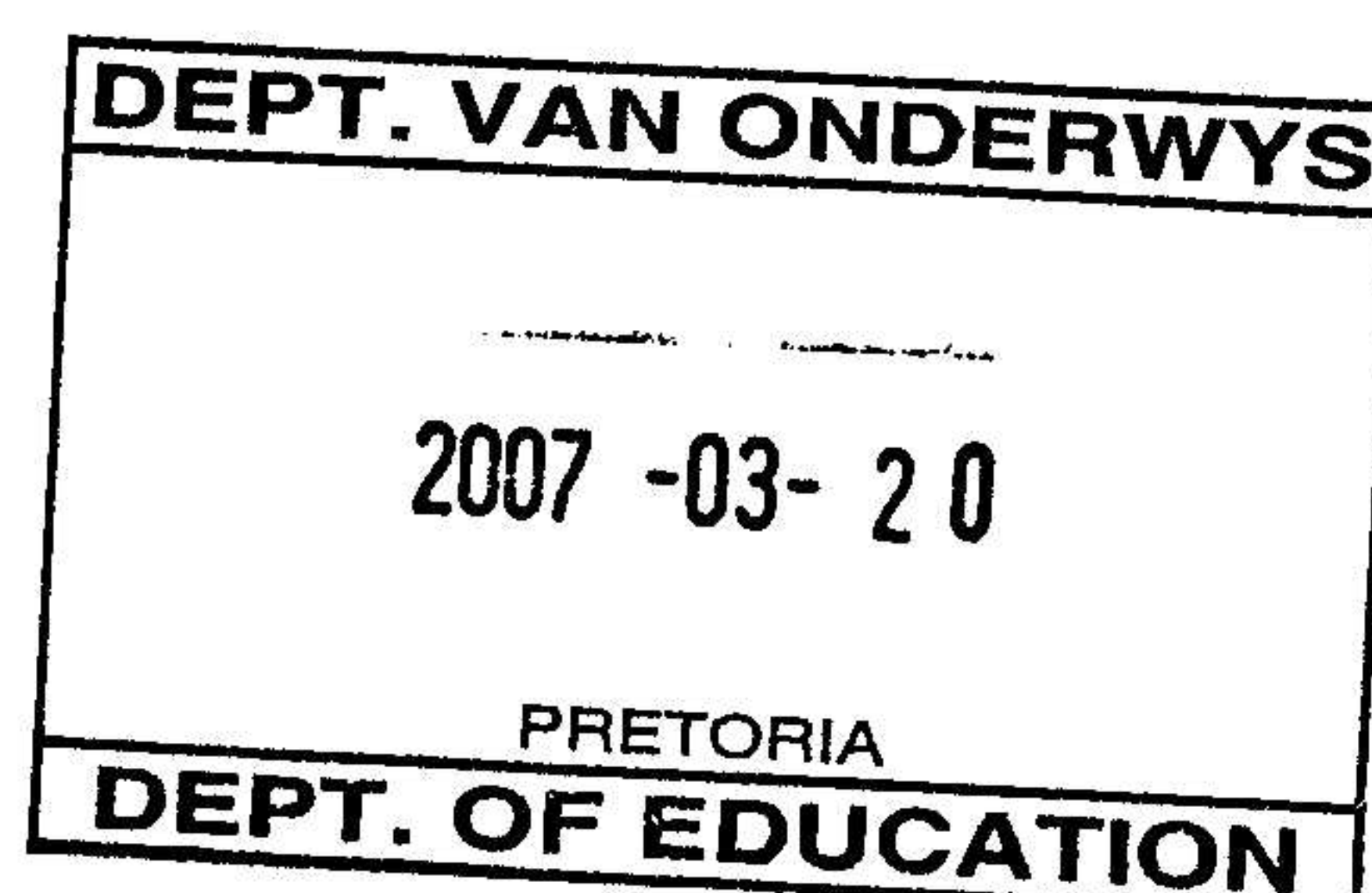
- 2.5
- Infiltration rate ✓ (1)
  - Water storage ✓ (1)
  - Aeration ✓ (1)
  - Drainage ✓ (1)
  - Plant nutrients ✓ (any 3) (1)

- 2.6
- 2.6.1
- Dominant texture at point A is **clay**. ✓ (1)
  - Dominant texture at point C is **silt loam**. ✓ (1)

- 2.6.2
- At point A: % clay is 70 ✓ (1)
- % silt is 10 ✓ (1)
- % sand is 20 ✓ (1)
- At point B: % clay is 20 ✓ (1)
- % silt is 40 ✓ (1)
- % sand is 40 ✓ (1)

- 2.7
- Positive** on the Hydrogen side ✓ (1)
- Negative** on the Oxygen side ✓ (1)

[35]



**Question 3**

3.1 - Oxidation – is the chemical process whereby oxygen combines with minerals✓ in order to form a new product✓ (2)

- Reduction – it takes place under low oxygen concentration in wet conditions.✓ (1)

- electrons are gained and reduced elements become negative. ✓ (1)

3.2 3.2.1 **Frost damage**

When soil temperature is very low (winter) heavy frost may occur. ✓ (1)

Occurrence of frost during sensitive period of crops may cause damage. ✓ (1)

Frost sensitive crops should be planted on the northern slope. ✓ (1)

Southern slopes are more susceptible to frost. ✓ Any 2) (1)

3.2.2 **Evaporation and transpiration**

More water is lost through transpiration and evaporation when soil temperature is high.✓✓ (2)

Less water is lost through transpiration and evaporation when soil temperature is low.✓✓ (any 1) (2)

3.2.3 **Early crops**

For early crops, a warm sandy soil on a northern slope should be chosen✓ to hasten ripening of crops. ✓ (2)

3.3 Charge density✓ (1)

- This is the amount of charge per unit surface area. ✓ (1)

- The available surface area will determine the amount of cations that will be adsorbed. ✓ (1)

Cation charge✓ (1)

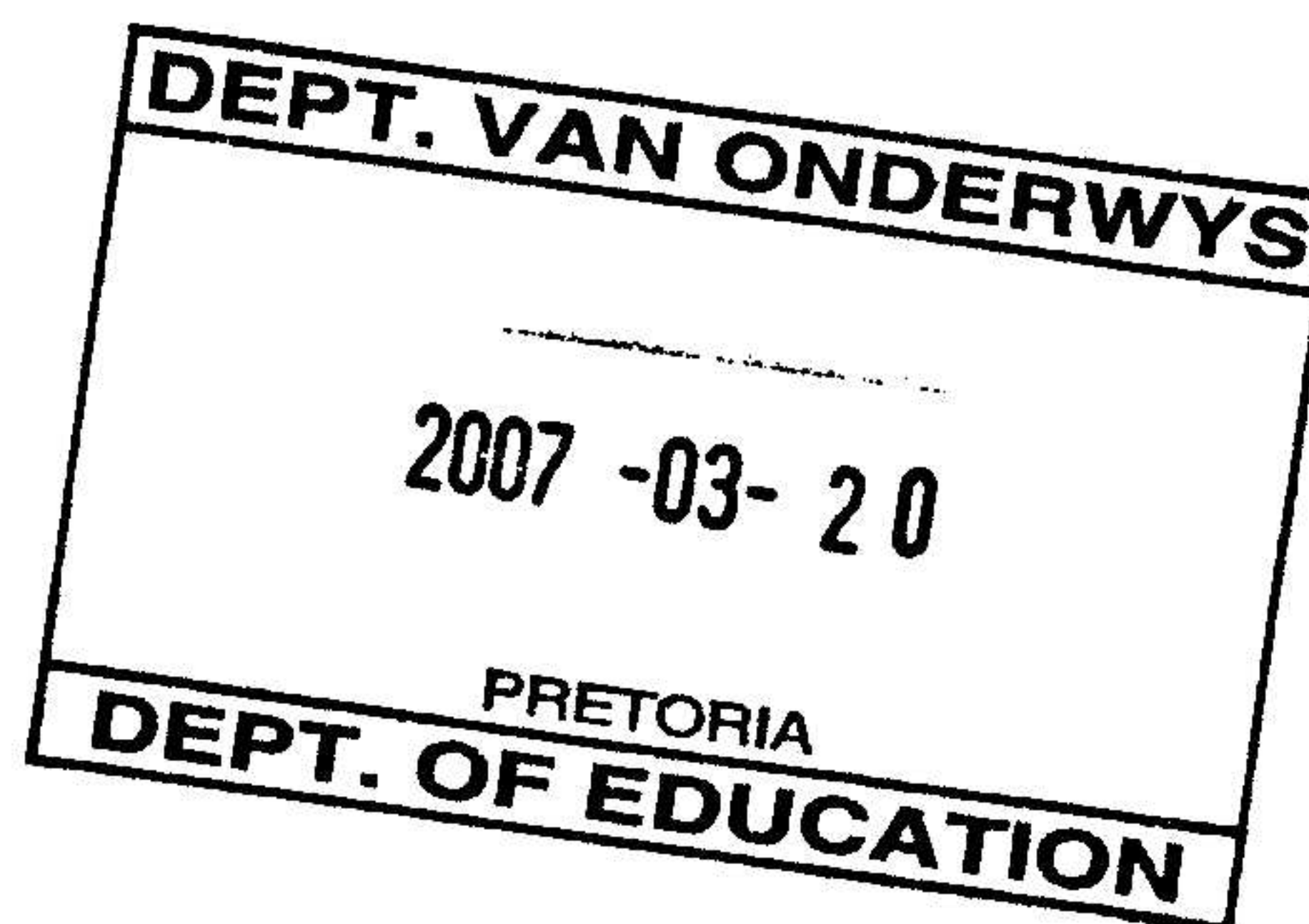
Monovalent cations ( $K^+$ ,  $Na^+$ ) will be less strongly adsorbed. ✓ (1)

Bivalent cations ( $Mg^{++}$ ,  $Ca^{++}$ ) will be more strongly adsorbed. ✓ (1)

Cation size✓ (1)

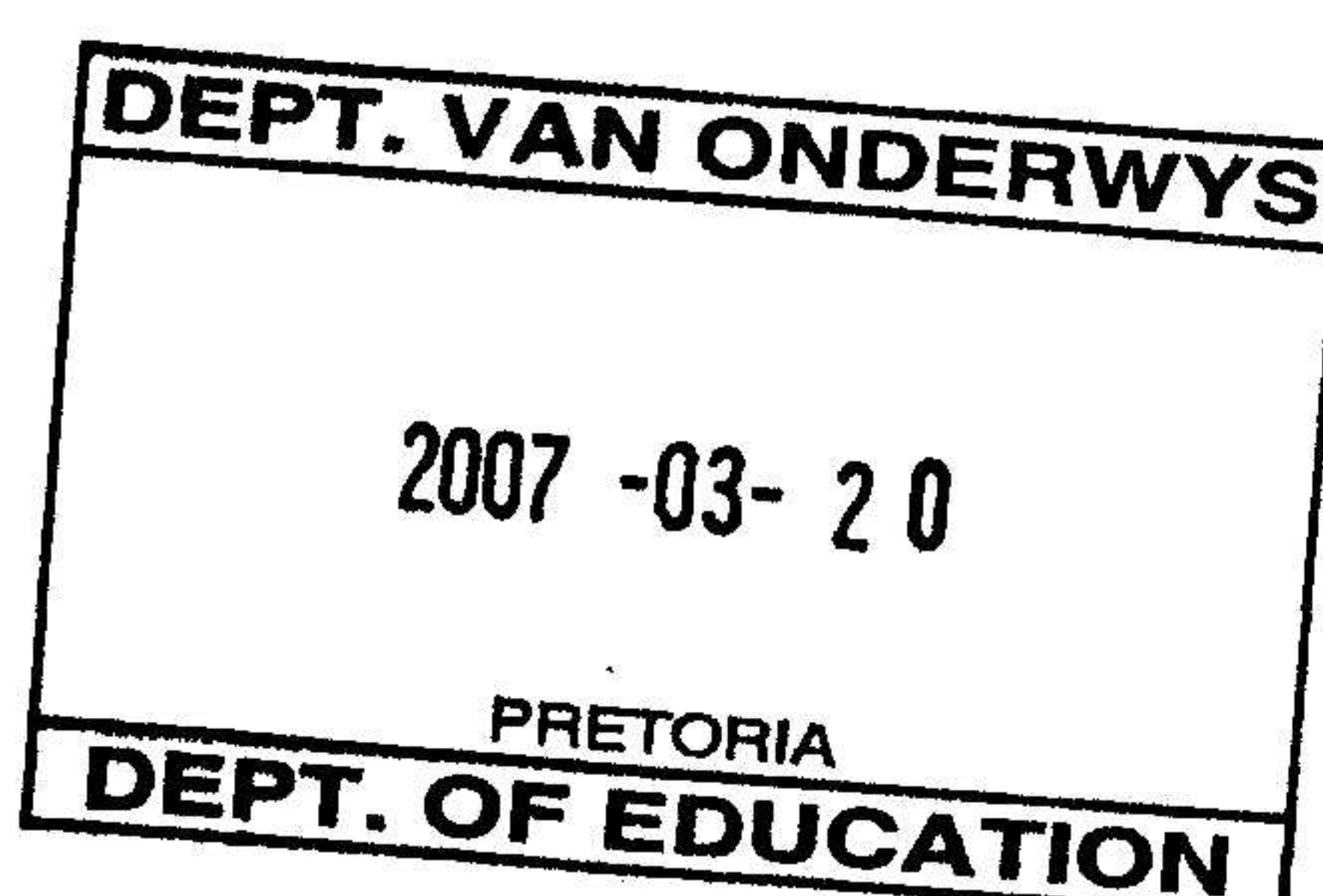
Hydrated cations are more important than the size of the cations. ✓ (1)

- Water molecules arrange themselves around the cations. ✓ (1)  
determination of the soil fertility and soil series. ✓ (2)
- 3.5 - Illite ✓ (1)  
- Vermiculite ✓ (1)  
- Montmorillonite ✓ (1)  
- Kaolinite ✓ (any 3) (1)
- 3.6 - Calcium ✓ (1)  
- Magnesium ✓ (1)  
  
- Potassium ✓ (1)  
- Sodium ✓ (1)
- 3.7 - Soil provides a place to anchor plant roots. ✓ (1)  
- Soil provides oxygen to the roots. ✓ (1)  
- Soil provides plant nutrients. ✓ (1)  
- Soil serves as buffer against large temperature variations. ✓ (1)  
- Soil provides plants with water ✓ (1)
- 3.8 **Cation Exchange Capacity**
- This is the amount of charge on clay ✓ per unit weight of soil. ✓ OR  
measurement of the ability of colloids ✓ in the soil to adsorb cations. ✓ (2)

**[35]**

**Question 4****4.1 Diagram of flower**

- 4.1.1      A. Pollen grain✓ (1)
- B. Male gametes✓ (1)
- C. Vegetative nucleus✓ (1)
- D. Integument✓ (1)
- F. Ovum/Egg cell✓ (1)
- I. Germ sac✓ (1)
- K. Umbilicus✓ (1)
- 4.1.2      **B. Male Gametes**
- Combine with both egg cell and endosperm cell. ✓ (1)
- C. Vegetative nucleus**
- Controls growth direction of the pollen tube. ✓ (1)
- 4.1.3      **E. Auxiliary cells**
- These get destroyed when pollen tube grows into the germ. ✓ (1)
- H. Endosperm**
- It forms tissue that provides food for the germinating embryo. ✓ (1)
- 4.1.4      - The pollen tube is formed and grows towards the ovule. ✓ (1)
- It is controlled by the vegetative nucleus. ✓ (1)
- One male gamete fuses with an ovum to form a zygote✓. (1)
- Another male gamete fuses with the endosperm cell✓ (1)
- The endosperm tissue is food for the developing embryo. ✓ (1)



**4.2 Stimulative parthenocarpy**

- It is the setting of fruit and further development✓ thereof with pollination as stimulus but without fertilisation. ✓ e.g. Currants✓ (3)

**4.3**

- Brightly coloured petals, smells and nectar attract insects✓. (1)

- Insects bring pollen grains to the flowers✓. (1)

- Pollination and fertilisation take place in a flower. ✓ (1)

- Flowers provide nectar for the production of honey. ✓ (1)

- Pollen is also used for the production of wax. ✓ (1)

**4.4 Fruit development****4.4.1 An accessory fruit**

- It develops from the ripened ovary as well as from other developed structures of the flower. ✓✓ (2)

**4.4.2 A multiple fruit**

- It develops from flower containing a large number of pistils on the same receptacle each developing into independent fruit. ✓✓ (2)

**4.4.3 Compound fruit**

- It forms from an inflorescence where each flower has its own ovary and seed. ✓ Flowers press against one another to form single compound fruit. ✓ (2)

**4.5**

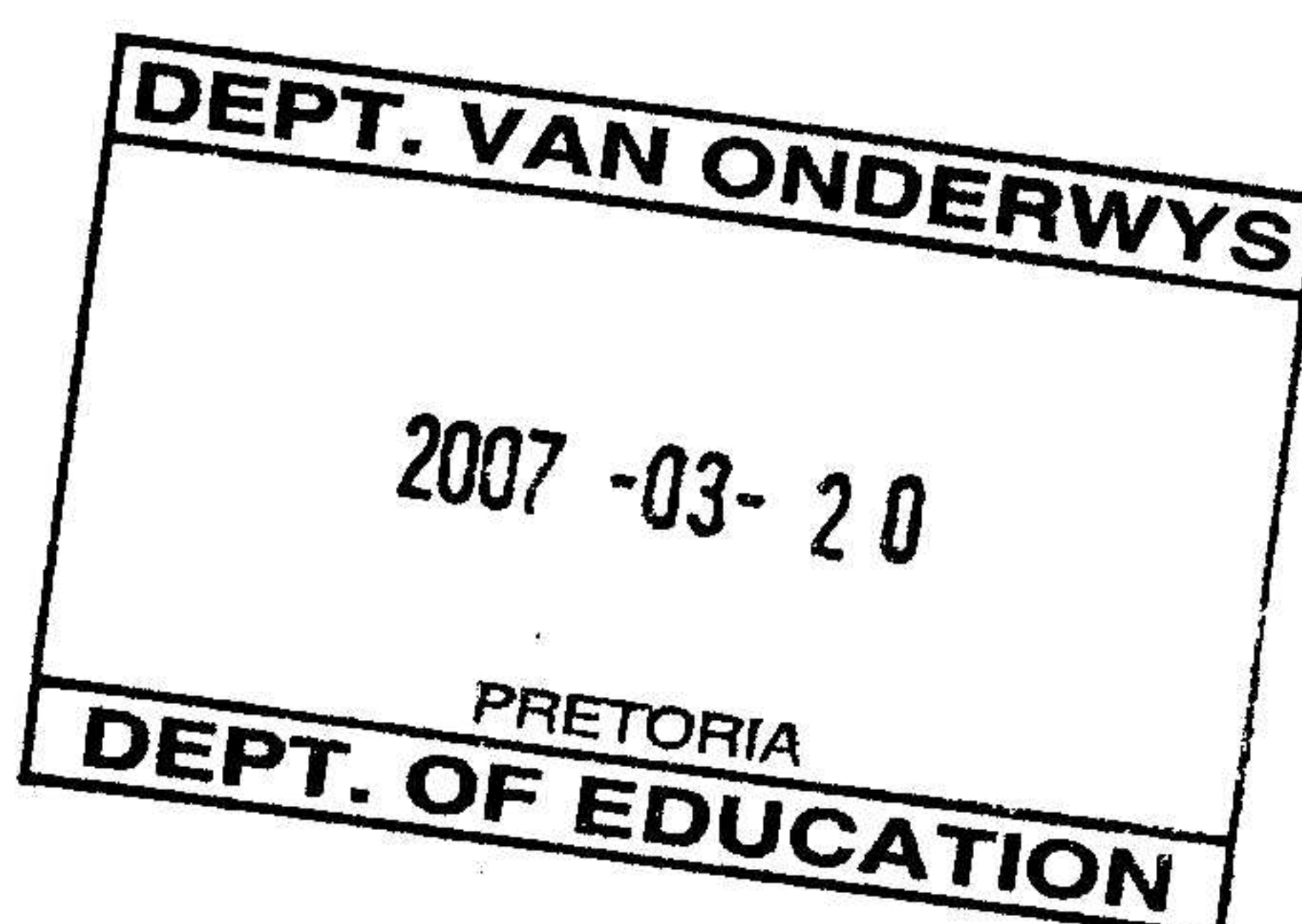
- Tongue grafting✓ (1)

- Machine grafting✓ (1)

- Split grafting✓ (1)

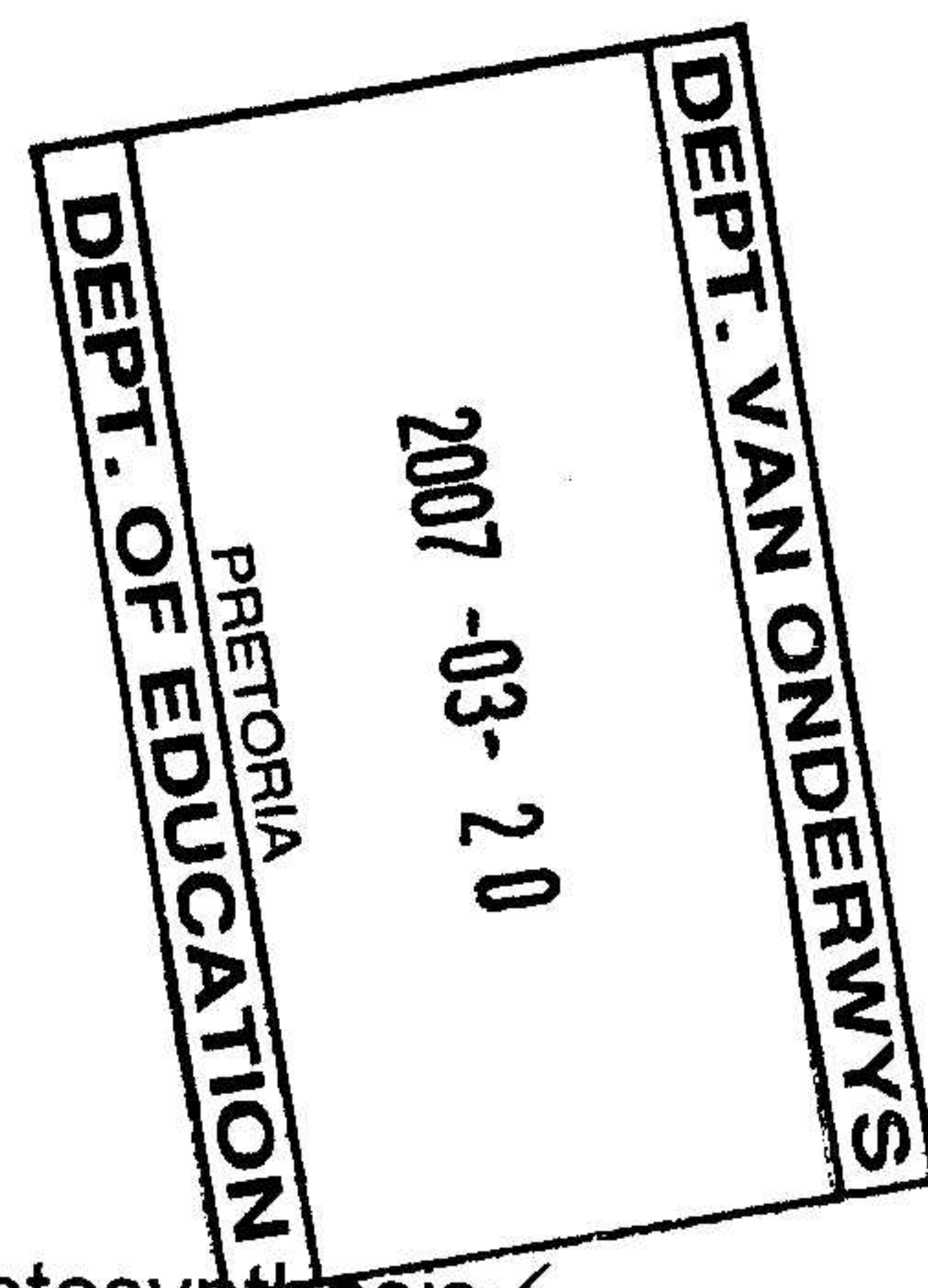
**4.6**

- Fruit setting is swelling of the ovary and pedicel✓ after petals have fallen. ✓ (2)

**[35]**

**Question 5****5.1 Water absorption by plants**

- 5.1.1 A. Water Absorption / Nutrients absorption✓ (1)
- B. Root growth and water absorption / Cell elongation / differentiation. ✓ (1)
- C. Protects root tip / growth / cell division✓ (1)
- 5.1.2 - Osmosis✓ (1)
- 5.1.3 - Water is used to transport nutrients. ✓ (1)
- It cools the plant. ✓ (1)
- It maintains the structure of the plant. ✓ (1)
- It acts as a solvent. ✓ (1)
- It is important for chemical reactions like photosynthesis✓. (1)

**5.2 Green manuring**

- 5.2.1 Humus. ✓ (1)
- 5.2.2 Legumes / Pod-bearing plants / Annual crops✓. (1)
- 5.2.3 They are capable of fixing nitrogen from the atmosphere / Mutualism. ✓ (1)
- 5.2.4 - Green manuring improves soil structure. ✓ (1)
- Increases the nitrogen content. ✓ (1)
- It reduces water and nutrient loss from the soil. ✓ (1)
- It increases organic matter content. ✓ (1)
- It prevents soil erosion. ✓ (1)

- 5.3 - Each crop has an optimal time to take leaf samples. ✓ (1)
- The best time to take leaf samples is from December to February. ✓ (1)
- Sample 10 to 20 young, mature, healthy and central leaves from the representative crop. ✓ (1)
- The leaves are selected from trees at about shoulder heights. ✓ (1)

- Pick the leaves before 10h00. ✓ (1)
- Do not wash them. ✓ (1)
- Put them in clean plastic bag and dispatch to laboratory. ✓ (1)

#### 5.4 Reclamation of alkaline soil

- 5.4.1 A = Gypsum ✓ (1)
- 5.4.2 B = Calcium ✓ (1)
- 5.4.3
  - Add 1 – 3 tons of gypsum per hectare. ✓ (1)
  - The calcium from calcium sulphate replaces the sodium ions. ✓ (1)
  - The sodium reacts with sulphate to form sodium sulphate. ✓ (1)
  - Sodium sulphate will be leached due to its solubility. ✓ (1)
  - Sodium sulphate leaching will be increased by heavy irrigation. ✓ (1)

#### 5.5 Splitting of water molecule

- Energy of the molecule increases after photon absorption by the chlorophyll. ✓ (1)
- The energy is used to split water molecule into oxygen and hydrogen. ✓ (1)
- The oxygen is released into the atmosphere. ✓ (1)
- Hydrogen is used for the synthesis of carbohydrates. ✓ (any 3) (1)

#### 5.6 Broadcasting fertiliser

- It is uniform spreading of the fertiliser over the planted area ✓ usually done before or during planting ✓. (2)

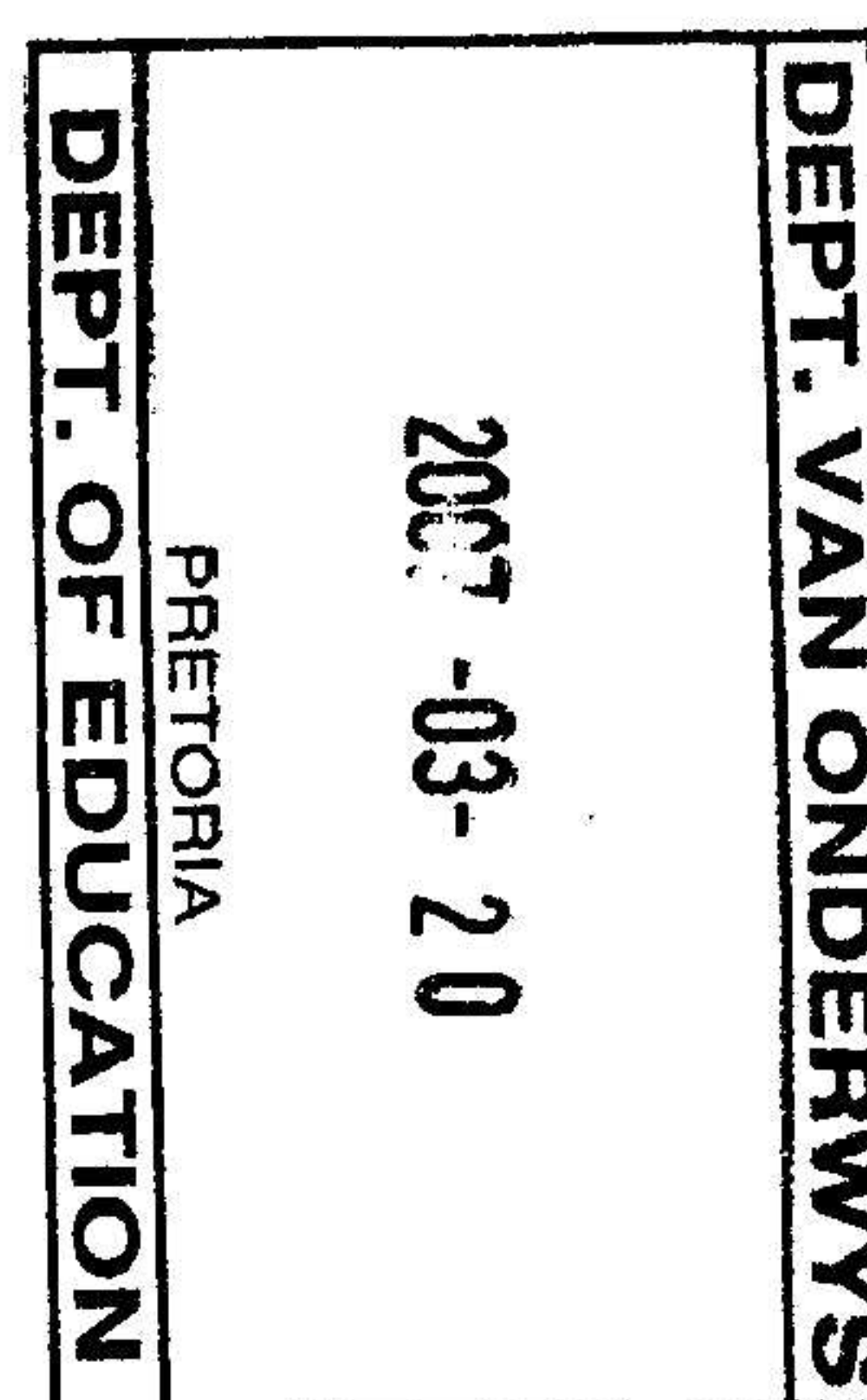
#### 5.7 Lime application

*When* - Before the rainy season / before planting. ✓ (1)

*How* - Broadcasting evenly / ploughed into the soil ✓ (1)

##### Types of lime

- Calcitic agricultural lime ✓ - 15%  $\text{MgCO}_3$  ✓ (2)
- 70%  $\text{CaCO}_3$  ✓ (1)
- Dolomitic agricultural lime ✓ - 20%  $\text{MgCO}_3$  ✓ (2)
- 80%  $\text{CaCO}_3$  ✓ (1)



**5.9 Fertilisers for foliar application**

- Borax✓ (1)
  - Sodium molybdate✓ (1)
  - Urea✓ (1)
  - Ammonium sulphate✓ (1)
  - Potassium sulphate✓ (1)
- [45]**

**Total Section B = 150**  
**Grand Total = 200**

