

Possible Answers Supp 2007

AGRICULTURAL SCIENCE/P2/SC
SEN

DōE/FEB/MAR 2007
CATE EXAMINATION - 2006

SECTION A

QUESTION 1

1.1 Multiple choice

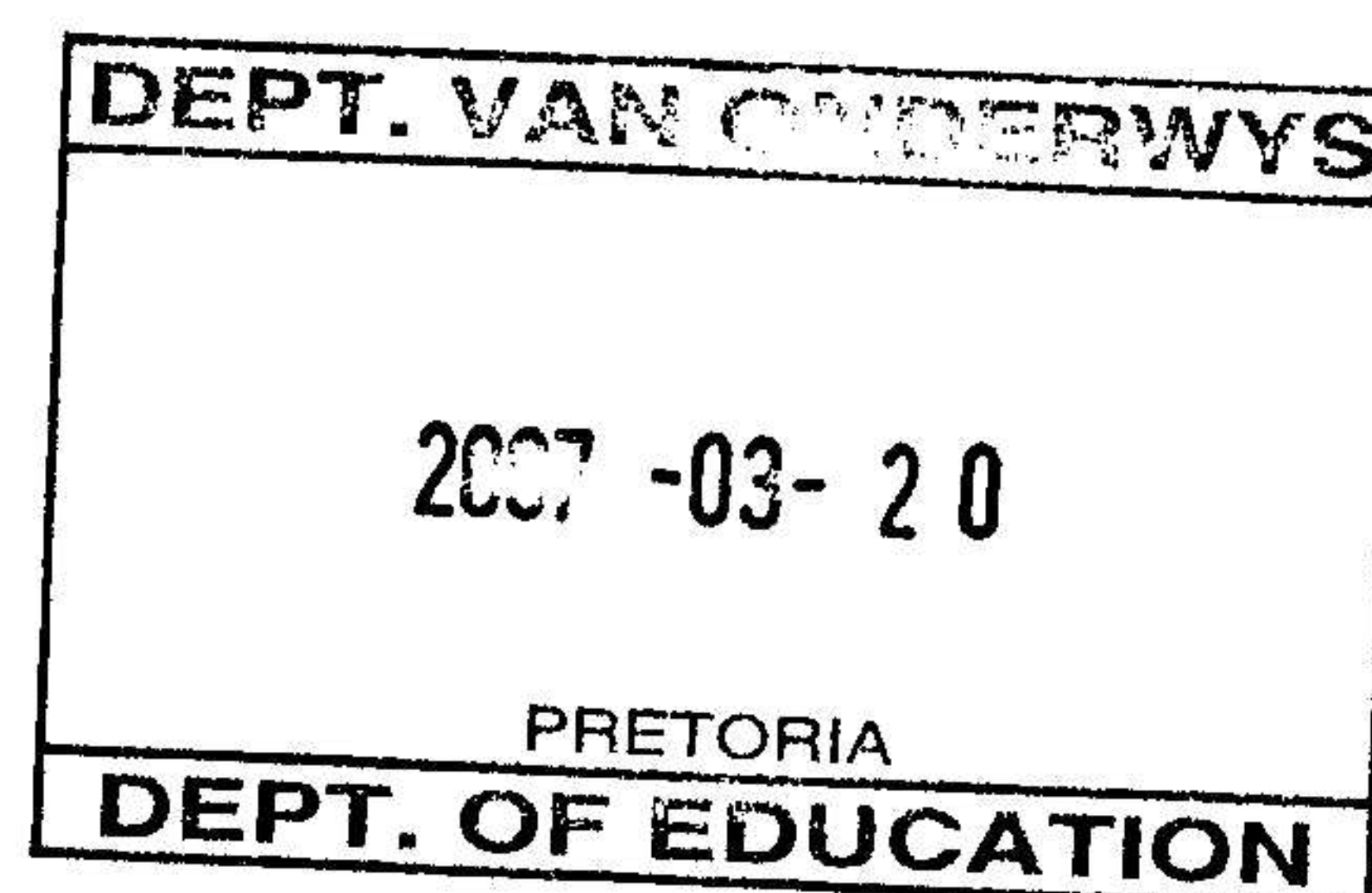
- 1.1.1 A✓✓ (2)
- 1.1.2 D✓✓ (2)
- 1.1.3 B✓✓ (2)
- 1.1.4 C✓✓ (2)
- 1.1.5 D✓✓ (2)
- [10]

1.2 Correct terms

- 1.2.1 Co-operatives✓✓ (2)
- 1.2.2 Carbohydrates✓✓ (2)
- 1.2.3 Crop rotation✓✓ (2)
- 1.2.4 Production✓✓ (2)
- 1.2.5 Tensiometer✓✓ (2)
- [10]

1.3 Matching the columns

- 1.3.1 B✓✓ (2)
- 1.3.2 H✓✓ (2)
- 1.3.3 C✓✓ (2)
- 1.3.4 F✓✓ (2)



1.3.5 D✓✓ (2)

[10]

TOTAL SECTION A: {30}

SECTION B

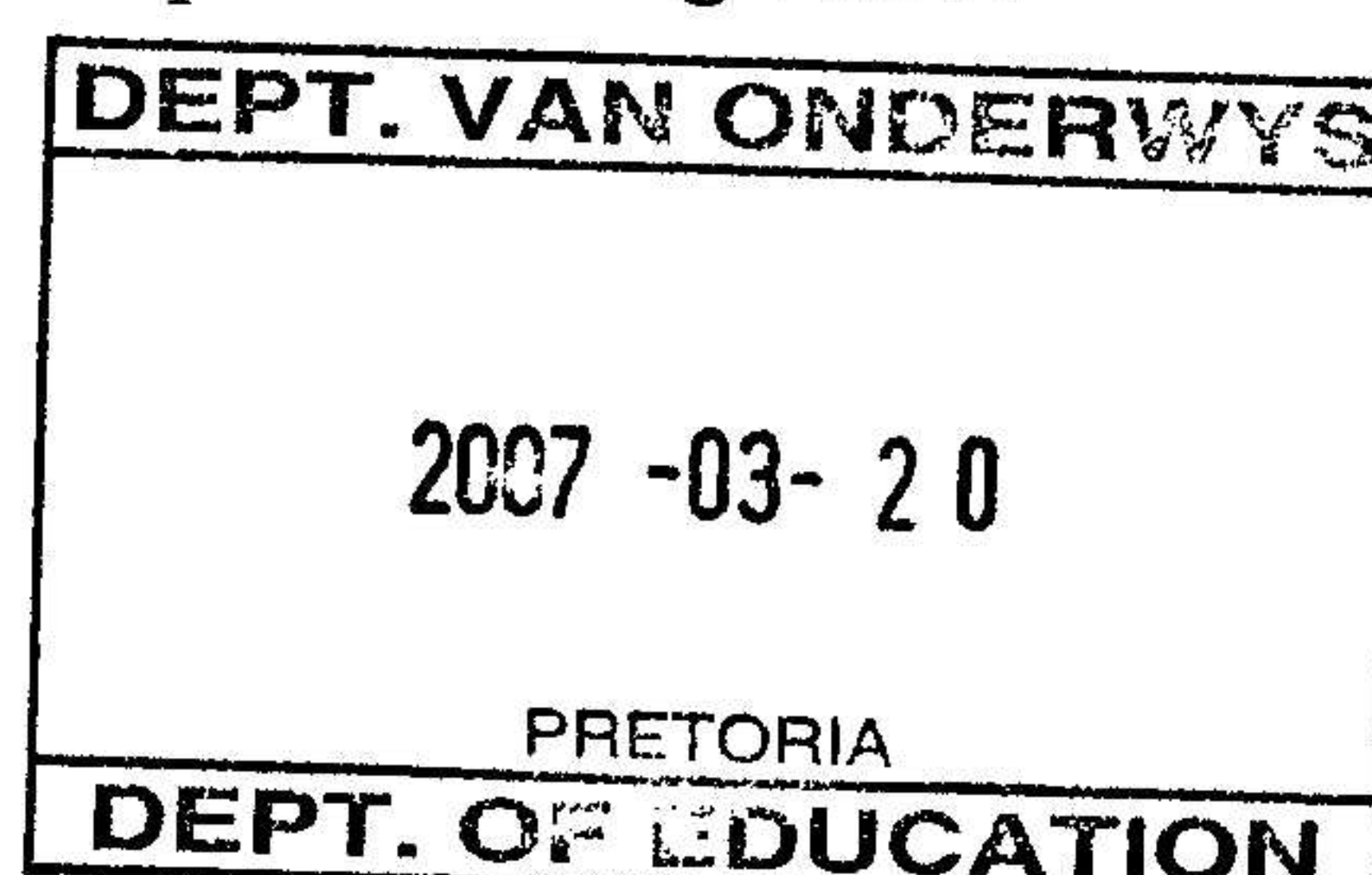
QUESTION 2 : ANIMAL NUTRITION

2.1 Digestive tract of the pig

- 2.1.1 B oesophagus/gullet✓ (1)
- C stomach✓ (1)
- D liver✓ (1)
- E pancreas✓ (1)
- F duodenum✓ (1)
- 2.1.2 amylase✓ (1)
- lipase✓ (1)
- trypsin/trypsinogen✓ (1)
- 2.1.3 G✓ (1)
- H✓ (1)

2.2 Types of digestion

- 2.2.1 digestion of food by microbes or micro-organisms in ruminants✓
bacteria and protozoa are the most common✓ (2)
- 2.2.2 digestion of food by chemical substances produced in the animal body✓
for example the different enzymes produced by the glands✓ (2)
- 2.2.3 digestion of food by chewing or mastication✓
occurring mostly in the mouth of the animal✓
in the chicken grinding takes place in the gizzard✓ (Any 2) (2)



- 2.3 water acts as a solvent and transport medium✓
 medium for chemical reaction✓
 controls body temperature✓
 serves as a lubricant✓
 gives shape to the body✓
 protects the nervous system from shocks✓
 medium for excreting waste products✓
 conducts sound in the ear✓
 conducts light in the eye✓

(Any 4) (4)

2.4 Absorption of digested food

- 2.4.1 process by which a gas or a substance in solution✓
 spreads from areas of high concentration to low concentration✓ (2)
- 2.4.2 the passage of solvent molecules across a semi-permeable membrane✓
 into an area in which there is a high concentration of a solute✓
 to which the membrane is impermeable✓ (Any 2) (2)
- 2.4.3 process where molecules move against concentration gradient✓
 energy is required for this to take place✓ (2)

2.5 Digestible dry material
$$= \frac{[7\text{kg} - (7\text{kg} \times 30\%)]}{100} - \frac{[3\text{kg} - (3\text{kg} \times 20\%)]}{100}$$

$$= (7\text{kg} - 2.10\text{kg}) - (3\text{kg} - 0.6\text{kg})$$

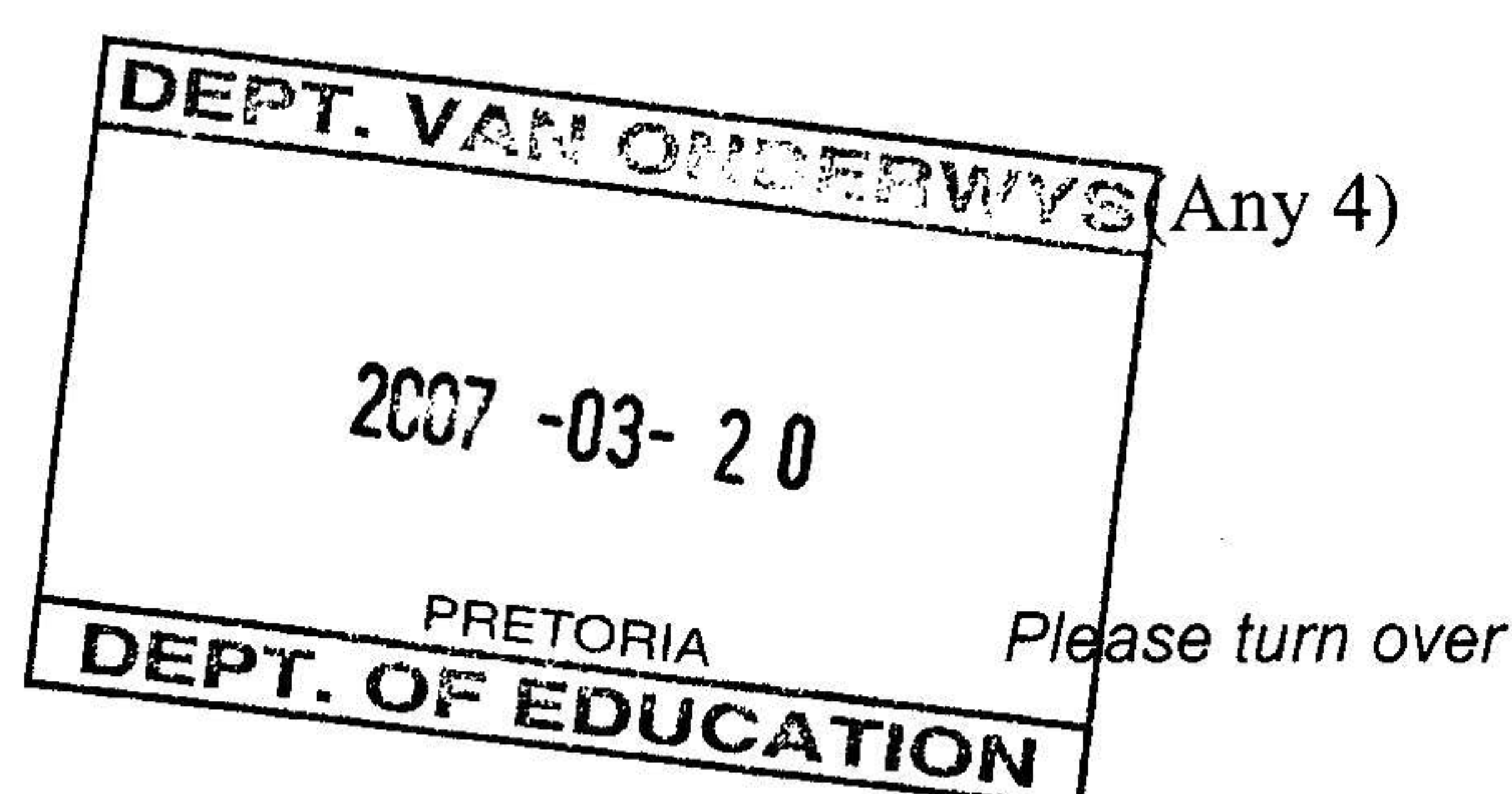
$$= 4.9\text{kg} - 2.4\text{kg}$$

$$= 2.5\text{kg or } 3\text{kg} \checkmark \checkmark$$
 (5)

- 2.6 formation of bones and teeth✓
 blood clotting✓
 maintain acid-base equilibrium✓
 key role in nerve and muscle function✓
 for milk and egg production✓

(Any 4) (4)

[35]



QUESTION 3 : ANIMAL REPRODUCTION

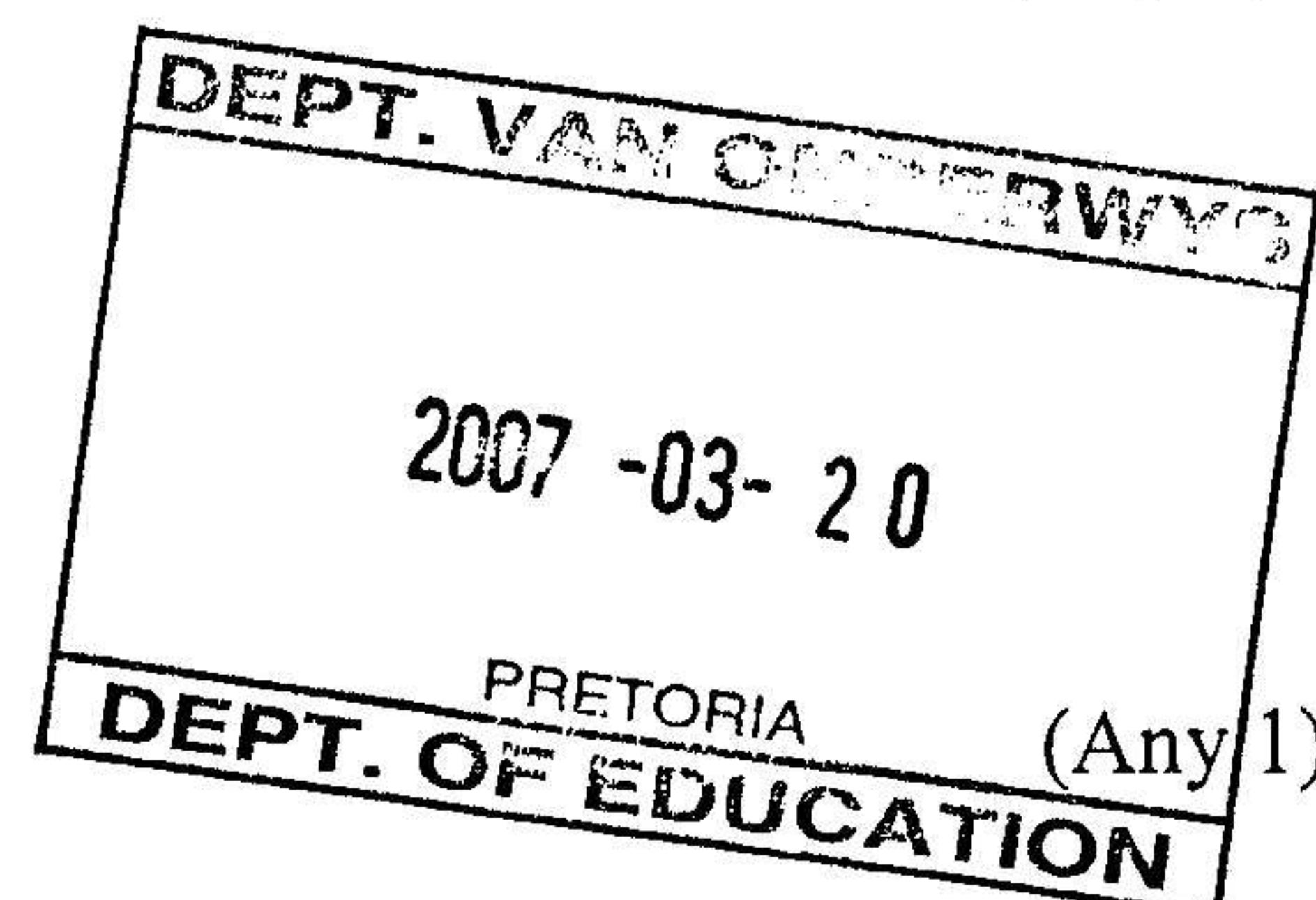
3.1 Reproductive organs of the cow

- 3.1.1
- (a) G✓ (1)
 - (b) B✓ (1)
 - (c) B✓ (1)
 - (d) I✓ (1)
 - (e) H✓ (1)
 - (f) G✓ (1)

- 3.1.2
- (a) management is an important aspect of breeding and if not performed correctly leads to infertility✓
incorrect timing with regard to mating of young heifers and after calving✓
poor hygienic conditions, especially during parturition✓
poorly adapted animals may show low fertility✓
correct cow to bull ratio✓ (Any 2) (2)
 - (b) delayed ovulation – ovulating at the wrong time✓
anovulation/no ovulation – no release of the ova✓ (2)
 - (c) overfeeding – cows that are too fat will not ovulate✓
underfeeding – delayed puberty and poor condition reduces fertility✓
unbalanced feeding – shortage of vitamins and minerals✓
oestrogen containing plants can interfere with oestrus cycles e.g. clover✓ (Any 2) (2)

3.2 Functions of hormones

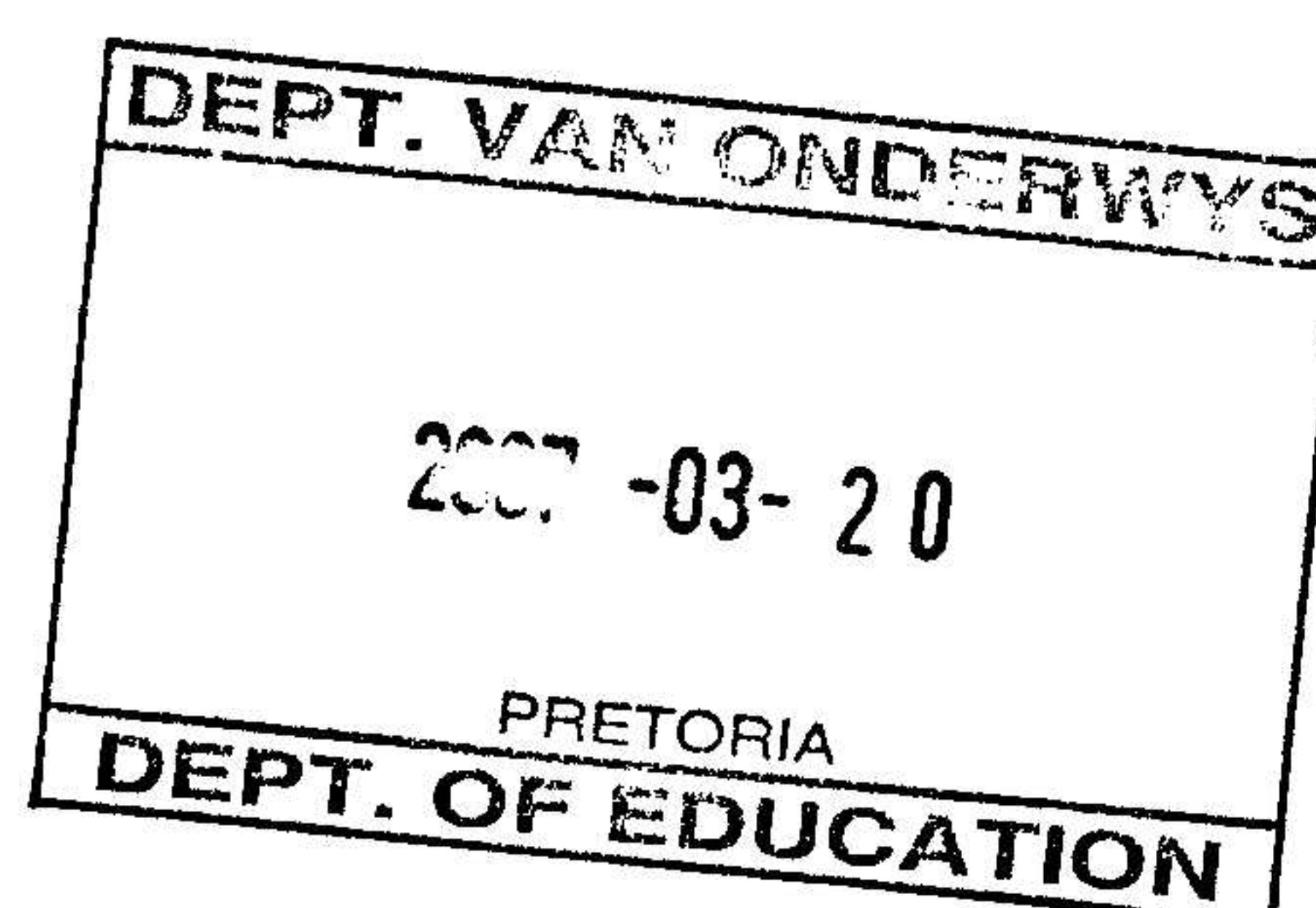
- 3.2.1
- sperm production✓
 - sexual desire and activity✓
 - male masculine characteristics✓
- 3.2.2
- causes the relaxation of the muscles and skeleton of the pelvic cavity to assist with the birth process✓ (1)
- 3.2.3
- growth and ripening of the Graafian follicles✓ (1)



- 3.3.4 maintains pregnancy by stimulating the corpus luteum✓
enhances the secretion of progesterone✓
stimulates the growth of the udder✓ (Any 1) (1)

3.3 Artificial insemination (A.I.)

- 3.3.1 dairy is intensive farming which suites the practice of artificial insemination
heat spotting is very easy during milking✓
insemination of cows can be done after milking✓
dairy cows are more docile and easier to inseminate✓
good sources of healthy, uninfected and viable semen is available✓
dairy staff are well trained in the artificial insemination procedures✓
most economical breeding method for dairy farmers as no bulls need to be bought and cared for✓
good record-keeping systems are in place for progeny records✓ (Any 5) (5)
- 3.3.2 bring the cow into a sheltered area, make it calm and comfortable✓
apparatus used must be absolutely clean✓
correct thawing and preparation of semen✓
remove faeces from rectum✓
handle pistolette with one hand✓
the other hand, in the rectum, hold the cervix✓
stretch the vagina to iron out folds✓
tip of pistolette guided through the cervix✓
half of the semen is deposited in the cervix✓
other half is deposited in the uterine horn✓
withdraw the pistolette✓
touch sex organs to stimulate secretion of oxytocin✓ (Any 6) (6)



3.4 Crossbreeding

- 3.4.1 mating of two pure bred animals of different breeds✓
increased vigour of the offspring when unrelated individuals are mated✓
perform better than the average of their parents✓

(3)

- 3.4.2 development of new breeds✓
greater production e.g. wool, milk, eggs, beef✓
faster growth rates✓
greater resistance to diseases✓
greater fertility✓
better adapted✓
utilise food better✓
possess better motherly instincts✓

(Any 5)

(5)

[35]

QUESTION 4 : OPTIMAL RESOURCE UTILISATION

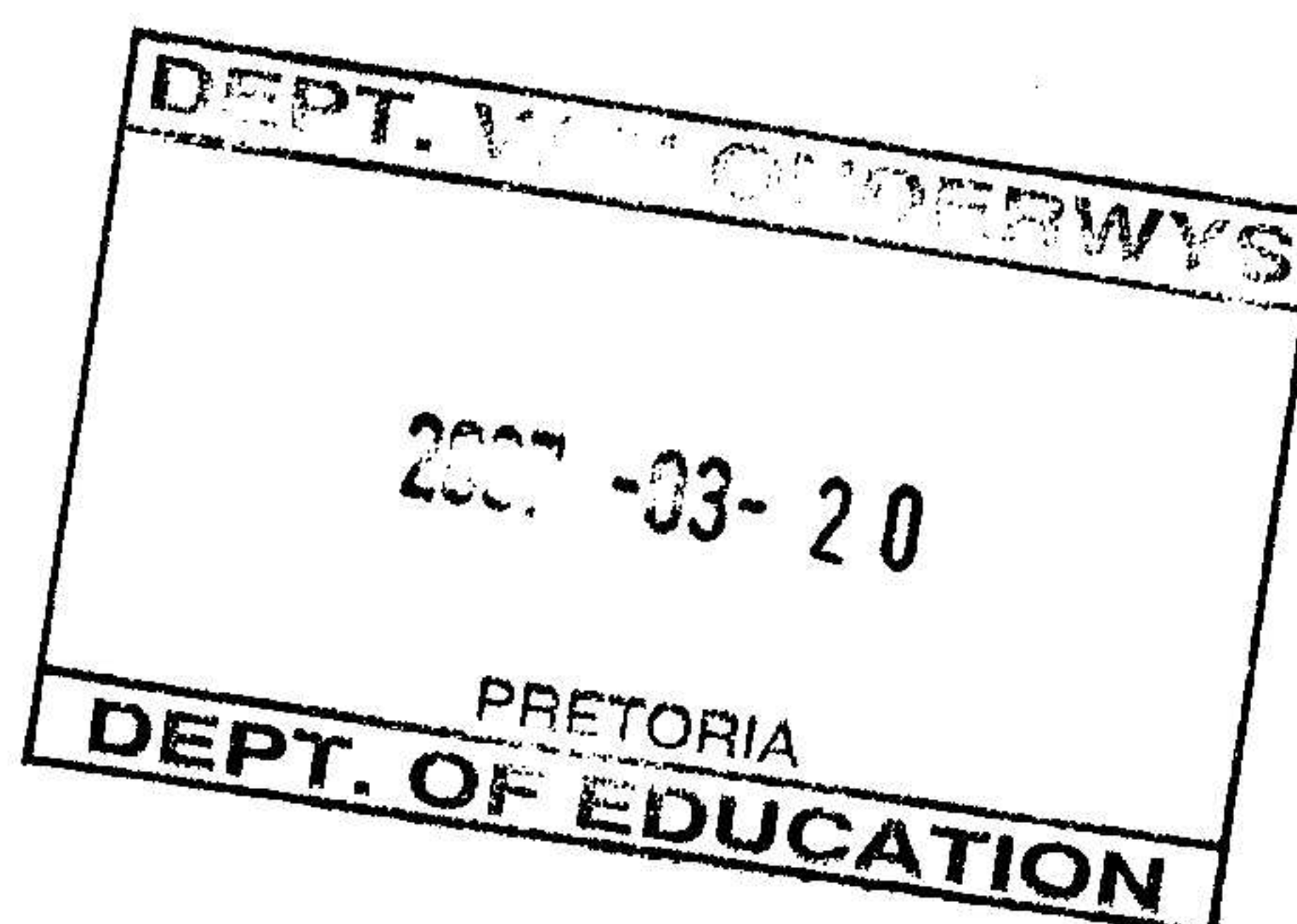
- 4.1 high producer prices may be an advantage of one crop✓
soil may be suitable for a limited number of crops✓
climate may limit farmers to a small number of crops✓

(3)

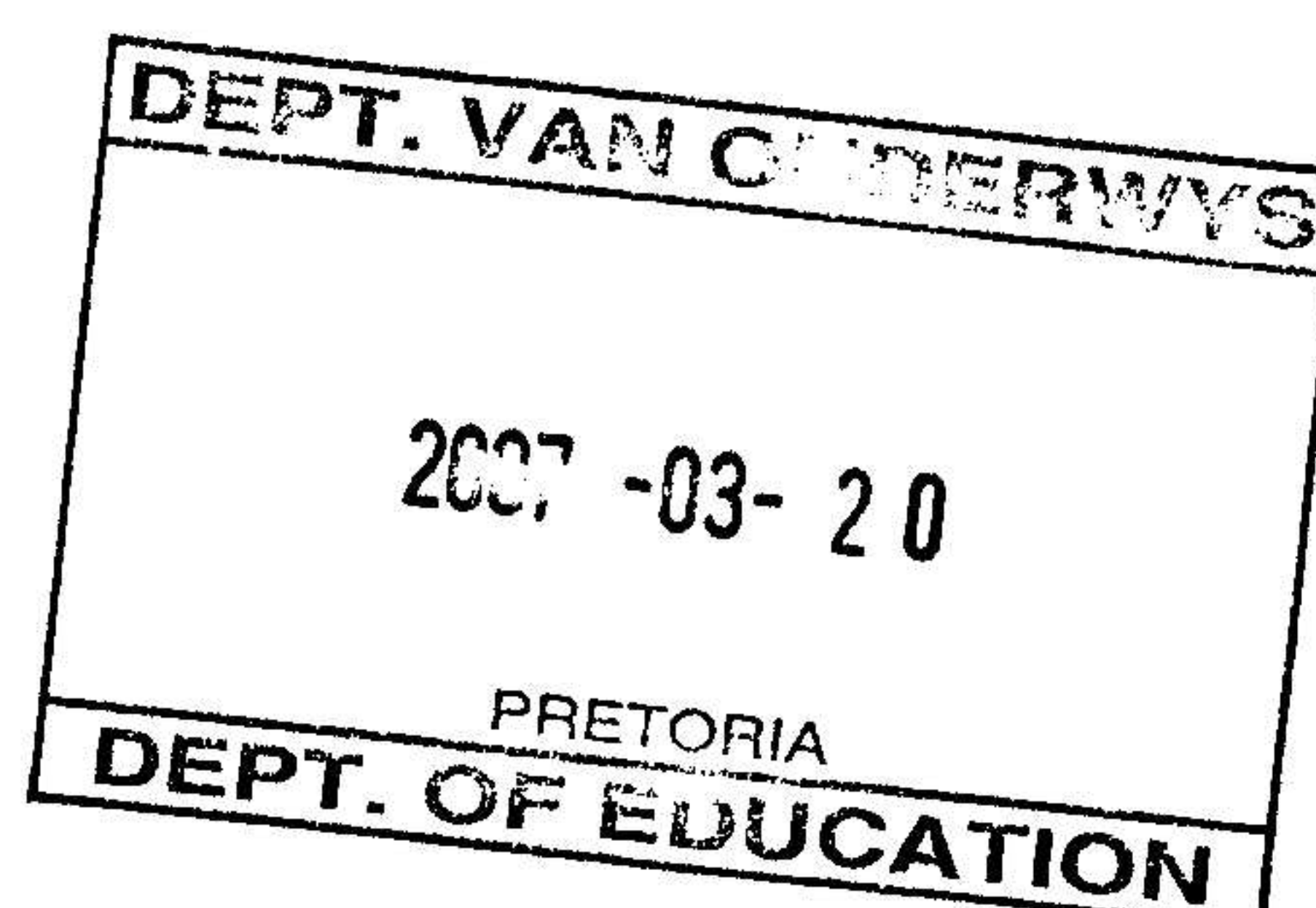
- 4.2 infiltration tempo of the soil (soil type)✓
topography✓
quantity of water available✓
salt content of the soil✓
quality of water✓
costs✓
type of crop✓
method of cultivation✓

(Any 5)

(5)



- 4.3 soil store and release water for use by plants✓
 provides air for respiration of plant roots and micro-organisms✓
 release nutrients to plants✓
 serves as growth medium for plants✓
 allows infiltration of water✓ (5)
- 4.4. better the aeration of soil✓
 development of a better root system✓
 increased soil temperature✓
 stimulate microbe activity✓
 soil cultivates more easily✓
 increased infiltration rate of the soil✓
 removal of harmful substances✓ (Any 6) (6)
- 4.5 total dissolved salts (salt content)✓
 turbidity✓
 biological matter✓
 sodium adsorption ratio✓
 toxic ions e.g. boron✓ (Any 3) (3)
- 4.6 give plants a chance to form seeds✓
 to store nutrients for regrowth✓
 establishment of young seedlings✓
 recovery of the veld for the next season✓
 veld improvement✓ (Any 3) (3)
- [25]



QUESTION 5 : AGRICULTURAL ECONOMICS

5.1 Case study

5.1.1 (a) eggs✓ (2)

braai packs✓

(b) deep freezer✓ (2)

trolly✓

(c) shop building✓ (2)

electric facilities✓

5.1.2 perishability/storage facility✓ ✓ (2)

5.1.3 total loss due to spoilage✓
low prices✓ (2)

5.2 Short-term credit✓

e.g. money used to buy goods required in production processes viz. seeds, fertilizers,
weedicides, pesticides etc. ✓ (Any one example) (2)

Medium-term credit✓

e.g. money for buying livestock, machinery, implements, etc.✓ (2)
(Any one example)

Long-term credit✓

e.g. money for buying land/farm, erecting buildings or building a dam etc.✓ (2)
(Any one example)

5.3 Graph

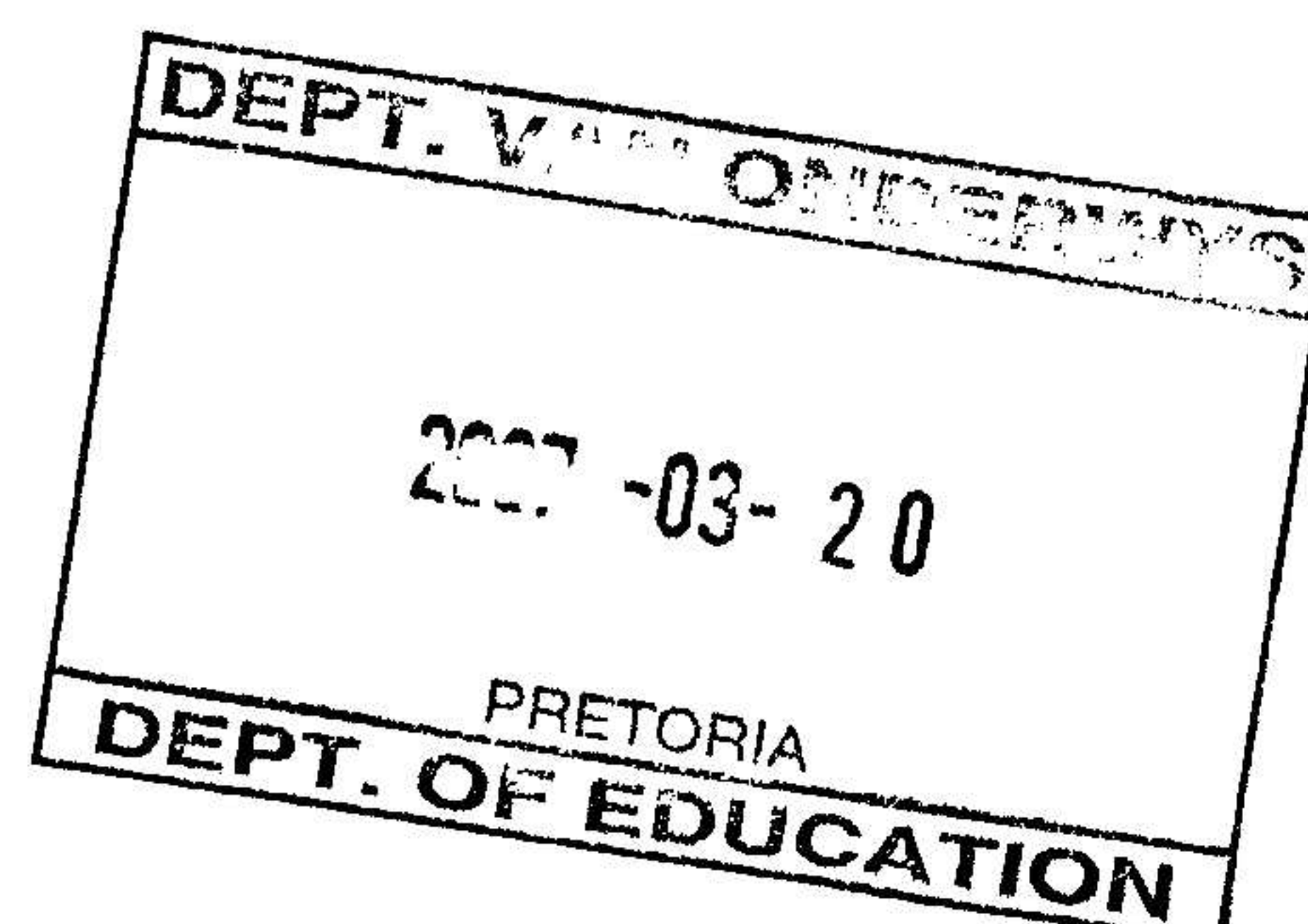
5.3.1 (a) W – supply curve✓ (1)

(b) T – demand curve✓ (1)

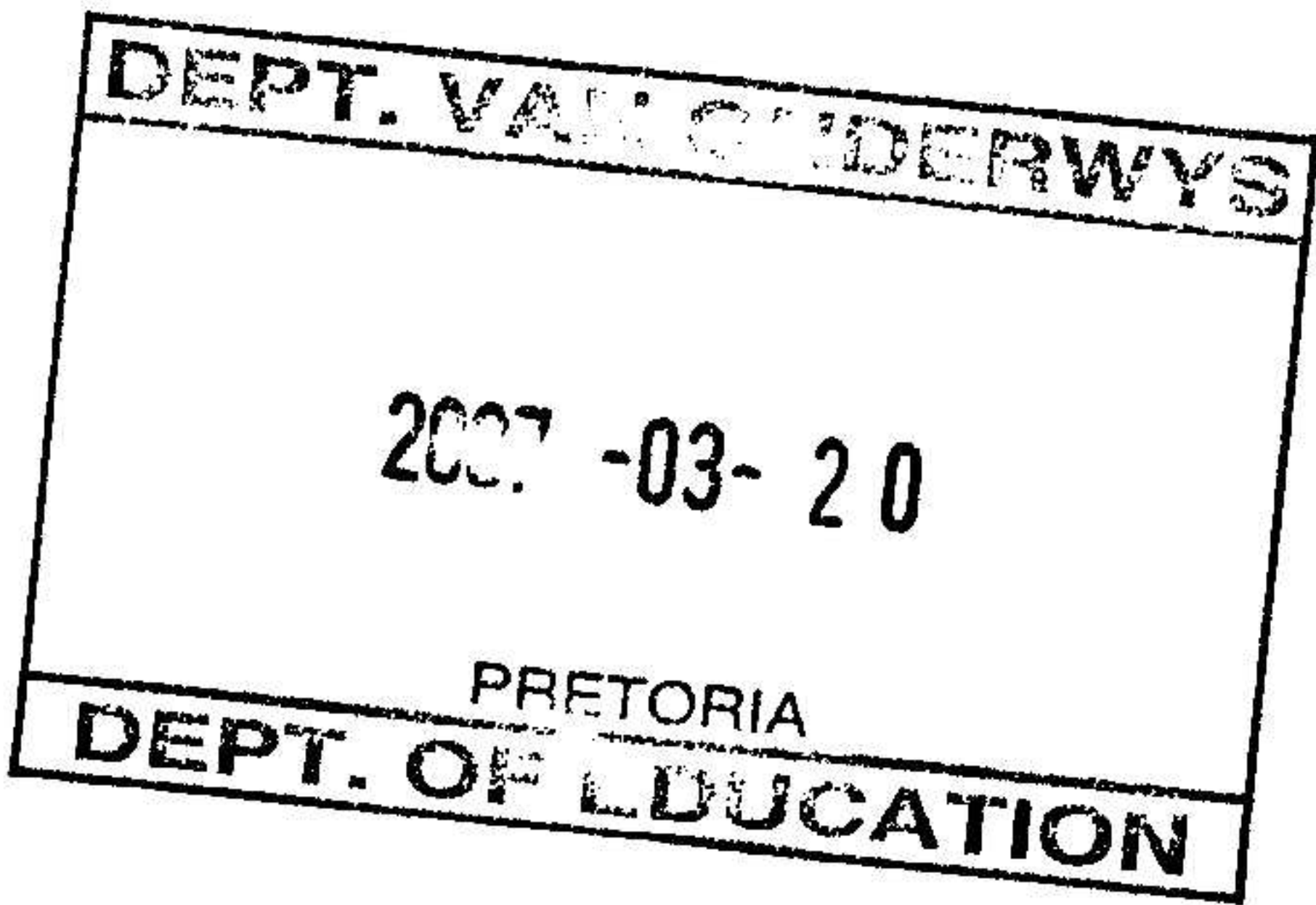
(c) X – surplus in the market✓ (1)

(d) Y – shortage in the market✓ (1)

5.3.2 demand being equal✓
to the supply✓ (2)



5.4	direct sales to the consumer✓		
	direct sales to the food processing factories✓		
	direct sales to wholesalers✓		
	direct sales to retailers✓		
	sales through middlemen to consumers✓	(Any 3)	(3)
			[25]
		TOTAL SECTION B:	120
		GRAND TOTAL :	150



AFDELING A

VRAAG 1

1.1 Meerkeusige vrae

1.1.1 A✓✓ (2)

1.1.2 D✓✓ (2)

1.1.3 B✓✓ (2)

1.1.4 C✓✓ (2)

1.1.5 D✓✓ (2)

[10]

1.2 Korrekte term

1.2.1 Koöperasies✓✓ (2)

1.2.2 Koolhidrate✓✓ (2)

1.2.3 Gewas rotasie✓✓ (2)

1.2.4 Produksie✓✓ (2)

1.2.5 Tensiometer✓✓ (2)

[10]

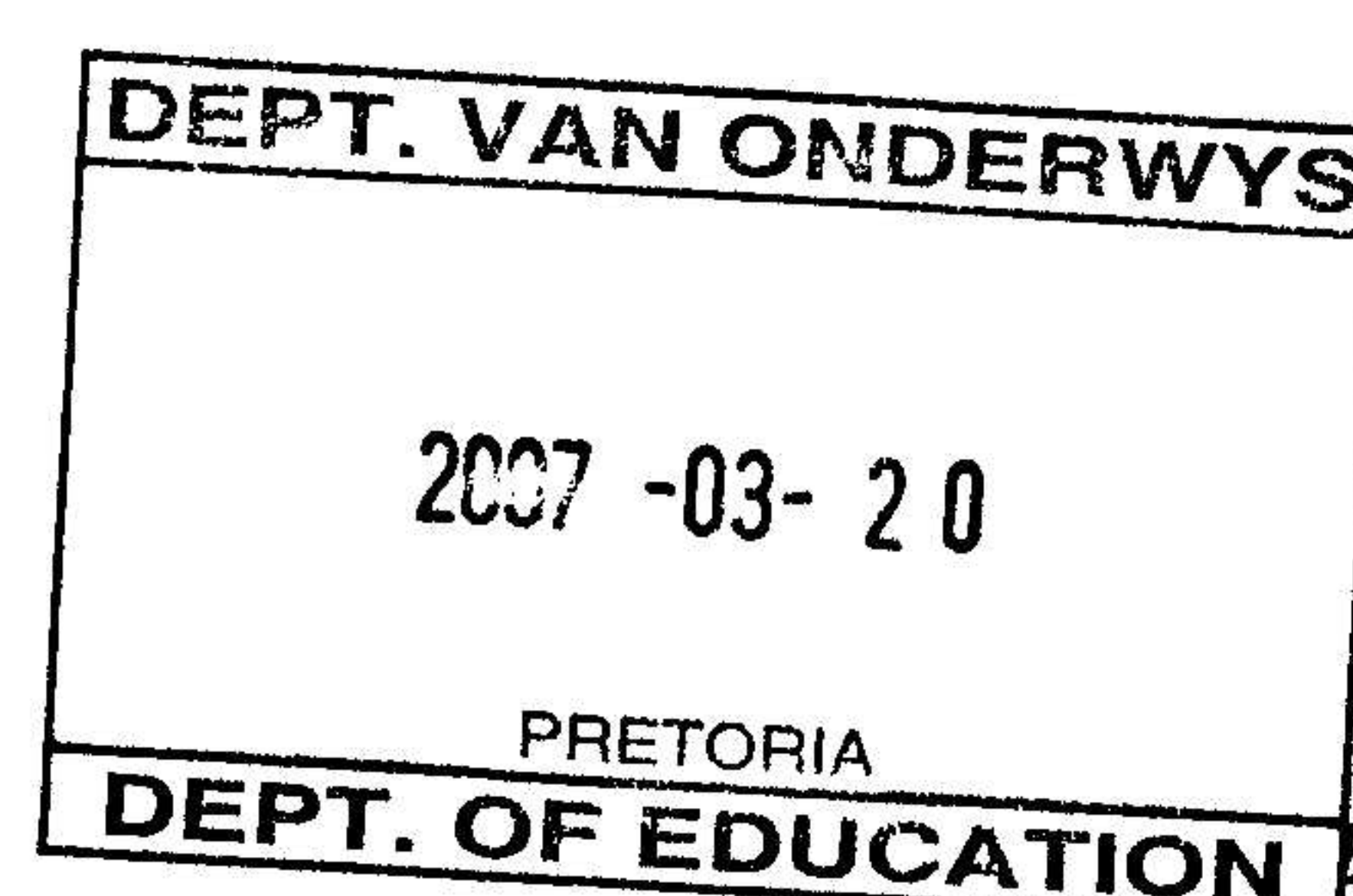
1.3 Pas die kolomme

1.3.1 B✓✓ (2)

1.3.2 H✓✓ (2)

1.3.3 C✓✓ (2)

1.3.4 F✓✓ (2)



1.3.5 D✓✓ (2)

[10]

TOTAAL AFDELING A: {30}

AFDELING B

VRAAG 2 : DIEREVOEDING

2.1 Spysverteringskanaal van die vark

- 2.1.1 B slukderm / oesophagus✓ (1)
C maag✓ (1)
D lewer✓ (1)
E pankreas✓ (1)
F dunderm / duodenum✓ (1)

- 2.1.2 amilase✓ (1)
lipase✓ (1)
tripsien/tripsinogeen✓ (1)

- 2.1.3 G✓ (1)
H✓ (1)

2.2 Tipe vertering

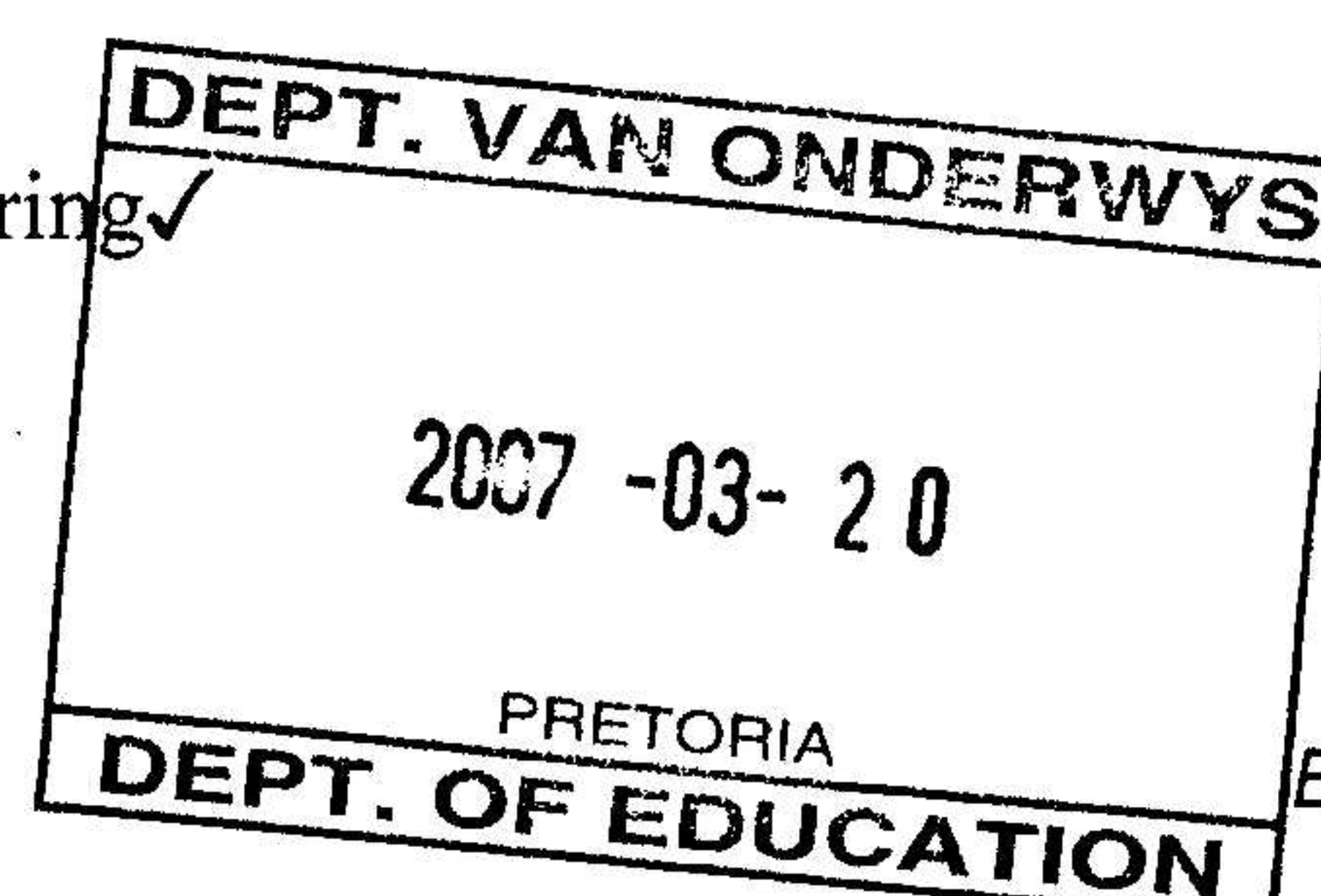
- 2.2.1 vertering van voedsel deur mikro-organismes in die herkouer✓
bakterieë en protooë is meer algemeen✓ (2)

- 2.2.2 vertering van voedsel deur chemiese bestandele wat in die diereliggaam geproduseer word✓
byvoorbeeld die verskillende ensieme wat deur kliere geproduseer word✓ (2)

- 2.2.3 vertering van voedsel deur die kouproses of mastikasie✓
wat hoofsaaklik in die mond van die dier plaasvind✓
by die hoender word voedsel fyner gemaal in die spiermaag✓ (Enige 2) (2)

- 2.3 water dien as oplosmiddel en vervoermedium✓
medium waarin chemiese reaksies plaasvind✓
beheer liggaamstemperatuur✓
dien as 'n smeermiddel✓
gee vorm aan die liggaam✓
beskerm die senuweesisteem teen fisiese skokke✓
medium vir die uitskeiding van afvalstowwe✓
gelei klank in die oor✓
gelei lig in die oog✓ (Enige 4) (4)
- 2.4 Absorpsie van veteerde voedsel
- 2.4.1 proses waardeur 'n gas of bestanddeel in 'n oplossing✓
versprei van 'n gebied met 'n hoë konsentrasie na 'n gebied met 'n laer konsentrasie✓ (2)
- 2.4.2 die deurgang van opgeloste molekules deur 'n semi-deurlatende membraan✓
na 'n gebied met 'n lae konsentrasie opgeloste stowwe✓
waarvoor die mebraan nie deurlatend is nie✓ (Enige 2) (2)
- 2.4.3 proses waar molecules beweeg teen die konsentrasiegradiënt✓
energie word benodig om dit te laat plaasvind✓ (2)
- 2.5 verteerbare droëmateriaal
$$= \frac{[7\text{kg} - (7\text{kg} \times 30\%)]}{100} - \frac{[3\text{kg} - (3\text{kg} \times 20\%)]}{100}$$
$$= (7\text{kg} - 2.10\text{kg}) - (3\text{kg} - 0.6\text{kg})$$
$$= 4.9\text{kg} - 2.4\text{kg}$$
$$= 2.5\text{kg or } 3\text{kg} \checkmark \checkmark$$
 (5)
- 2.6 vorming van been en tande✓
bloedstolling✓
onderhou die suurbasis ewewig✓
sleutelrol in senuwee en spierfunksionering✓
vir melk en eierproduksie✓ (Enige 4) (4)

[35]



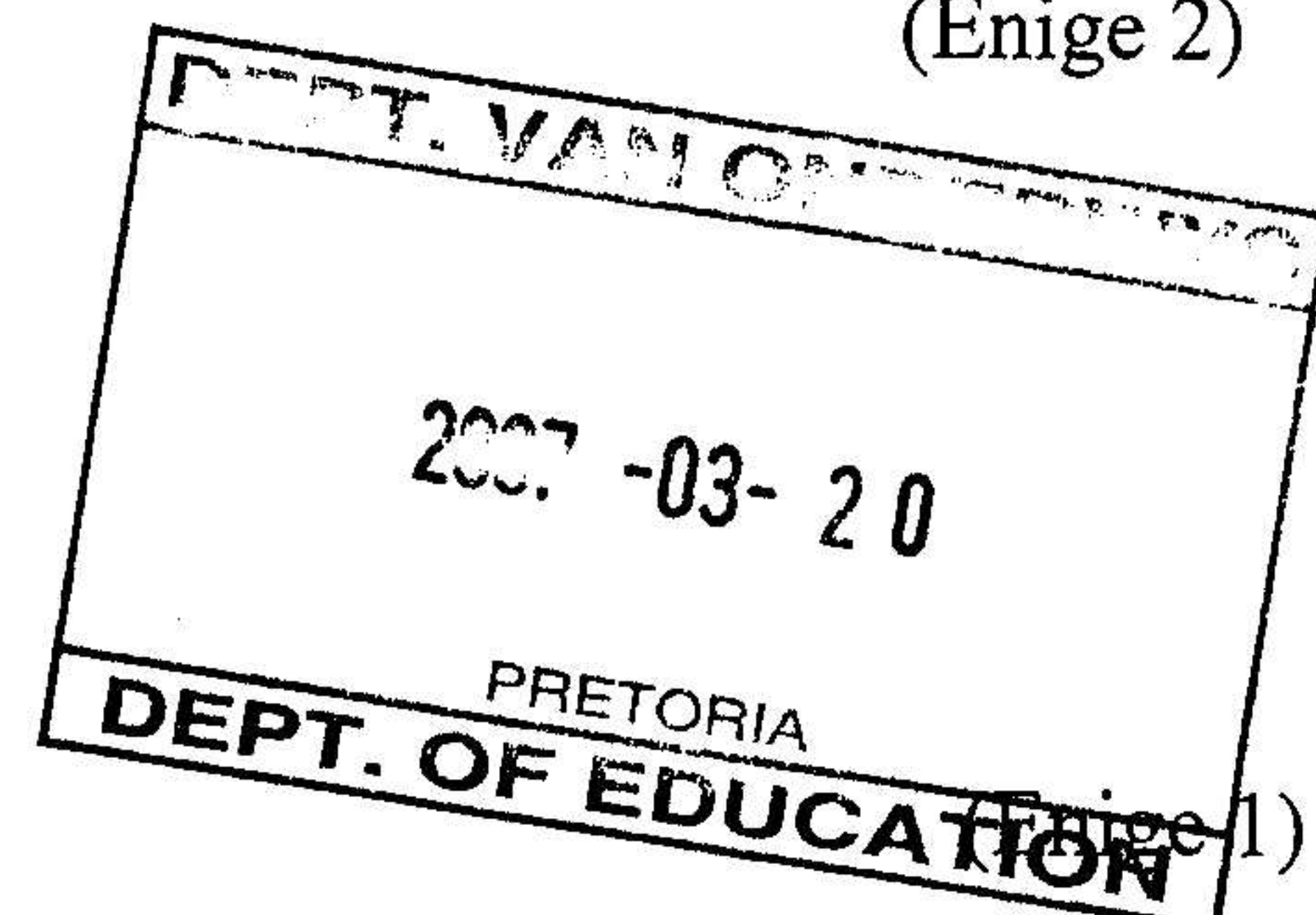
VRAAG 3 : DIEREREPRODUKSIE

3.1 Voortplantingsorgane van die koei

- 3.1.1
- (a) G✓ (1)
 - (b) B✓ (1)
 - (c) B✓ (1)
 - (d) I✓ (1)
 - (e) H✓ (1)
 - (f) G✓ (1)
- 3.1.2
- (a) bestuur is 'n belangrike aspek van teling en indien dit nie korrek toegepas word nie kan dit lei tot onvrugbaarheid✓
nie die korrekte tydsberekening by die dek van jong verse en na kalwing✓
swak higiene toestande veral tydens kalwing✓
swak aangepaste diere mag lae vrugbaarheid vertoon✓
korekte koei tot bul verhouding✓ (Enige 2) (2)
 - (b) vertraagde ovulasie – ovulasie op verkeerde tyd✓
anovulasie – geen vrystelling van die eiersel (ovum)✓ (2)
 - (c) oorvoeding – koeie wat te vet is sal nie ovuleer nie✓
ondervoeding – vertraagde geslagsrypheid en swak toestande verlaag vrugbaarheid✓
ongebalanseerde voeding – tekorte aan vitamienes en minerale✓
weiplante wat estrogeen bevat kan die bronstigheid beïnvloed bv. klaver✓ (Enige 2) (2)

3.2 Funksies van hormone

- 3.2.1
- sperm produksie✓
 - gelagsdrang en -aktiwiteit✓
 - manlike manlikheidseienskappe✓
- 3.2.2
- veroorzaak die verslapping van die skeletspier van die bekkenholte om die geboorteproses te ondersteun✓ (1)
- 3.2.3
- groei en rypwording van die Graafse follikel✓ (1)

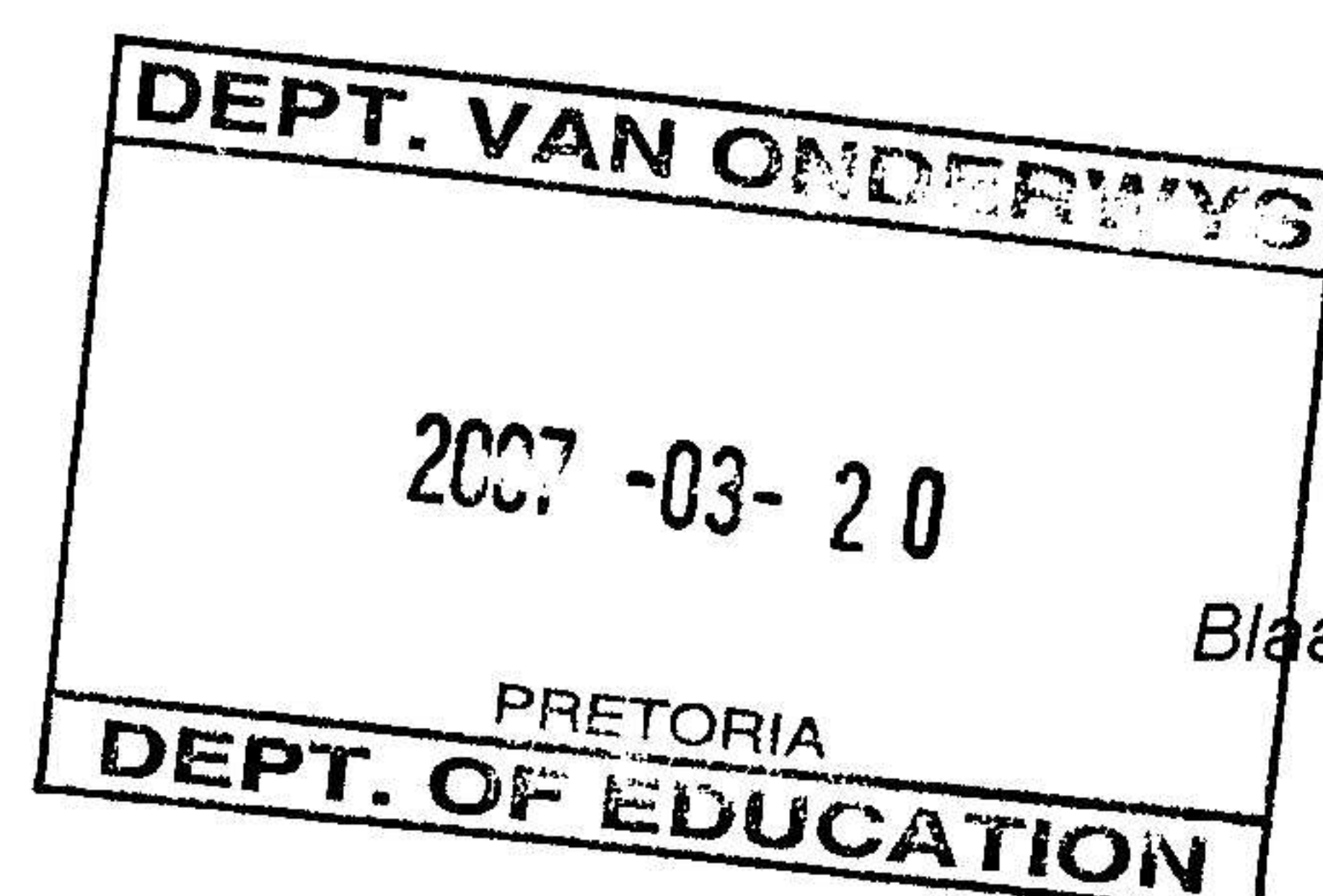


- 3.3.4 onderhou dragtigheid deur die corpus luteum te stimuleer✓
 verhoog die uitskeiding van progesteron✓
 stimuleer die groei van die uier✓ (Enige 1) (1)

3.3 Kunsmatige Inseminasie (KI)

- 3.3.1 'n melkery is 'n intensiewe boerdery wat deur die toepassing van kunsmatig
 inseminasie bevoordeel word✓
 bepaling van bronsigheid is maklik tydens melkings✓
 inseminasie van koeie kan na melkings gedoen word✓
 melkkoeie is meer mak en makliker om te insemineer✓
 goeie bronne van gesonde, onbesmette en lewenskragtige semen is
 beskikbaar✓
 arbeiders by melkerye is goed opgelei in die prosedures vir kunsmatige
 inseminasie✓
 dit is die mees ekonomiese telingsmetode vir melkboere omdat geen bulle
 gekoop en versorg moet word✓
 goeie rekordhoudingstelsels is in plek om nageslagtoetsing te
 doen✓ (Enige 5) (5)

- 3.3.2 bring die koei na 'n beskutte area en maak haar kalm en gemaklik✓
 die apparaat wat gebruik word moet absoluut skoon wees✓
 korrekte wyse ontdooi en voorbereiding van semen✓
 verwyder mis van rektum✓
 hanteer die pistolette met die een hand✓
 en die ander hand in die rektum hou die serviks vas✓
 rek die vagina uit om plooi te verwyder✓
 die voerpunt van die pistolette word deur die serviks begelei✓
 die helfde van die semen word in die serviks vrygelaat✓
 die ander helfde word in die baarmoeder vrygelaat✓
 onttrek die pistolette✓
 stimuleer die geslagsdele om die ekskresie van oksitosien te
 bevorder✓ (Enige 6) (6)



3.4 Kruisteling

- 3.4.1 paring van twee suiwer geteelde diere van verskillende rasse✓
verhoogde lewenskragtigheid by nageslag as nie verwante diere gepaar wor
presteer beter as die gemiddeld van hul ouers✓

(3)

- 3.4.2 ontwikkeling van nuwe rasse✓
hoër produksie bv. wol, melk, eiers, beesvleis✓
vinniger groeitempo✓
groter weerstand teen siektes✓
hoër vrugbaarheid✓
beter aanpasbaar✓
beter voerverbruik✓
beskik oor beter moedereienskappe✓

(Enige 5)

(5)

[35]

VRAAG 4 : OPTIMALE HULPBRONBENUTTING

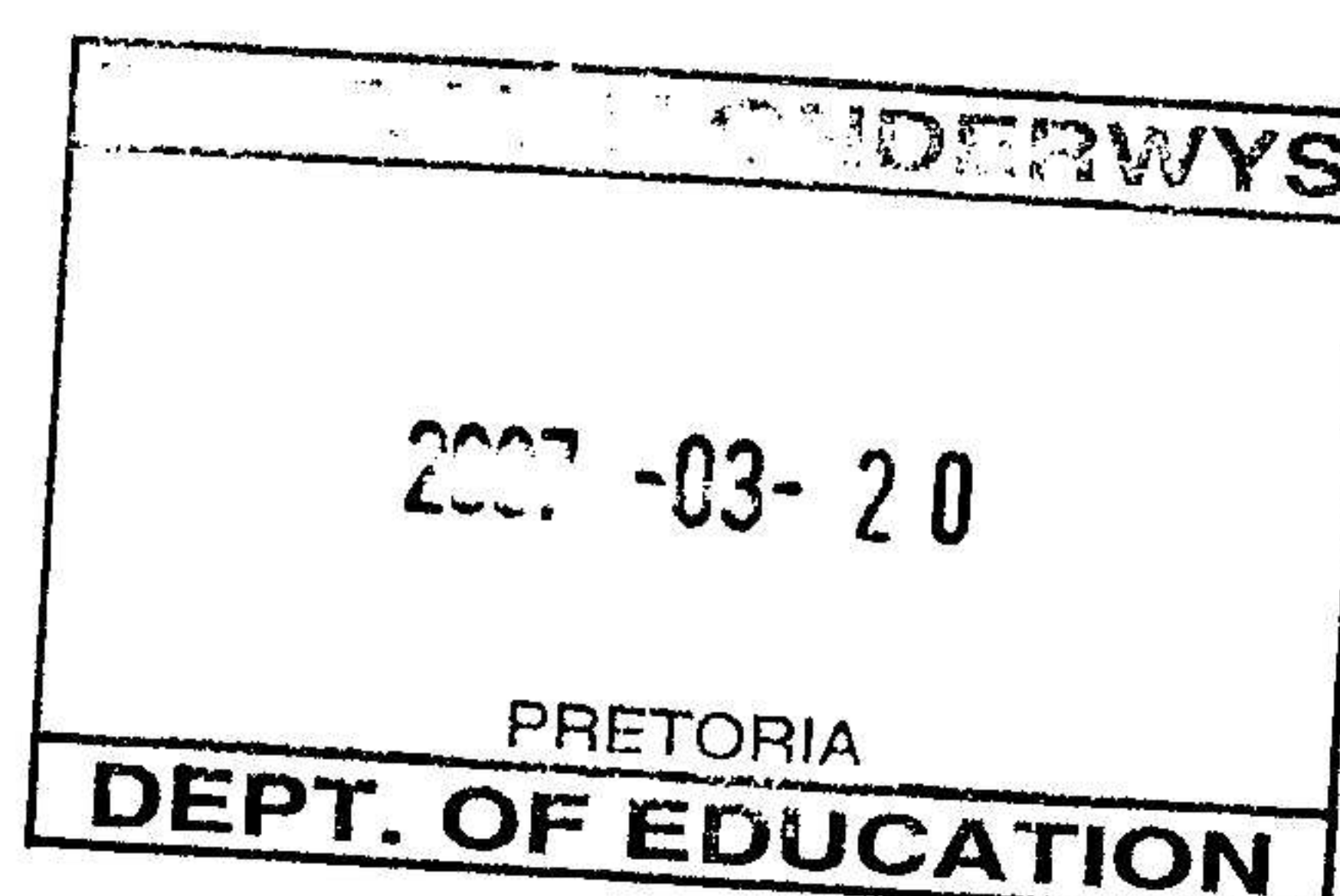
- 4.1 hoë produsentepryse mag 'n voordeel wees vir een gewas✓
grond mag gekik wees vir 'n beperkte aantal gewasse✓
klimaat kan boere beperk tot 'n beperkte aantal gewasse✓

(3)

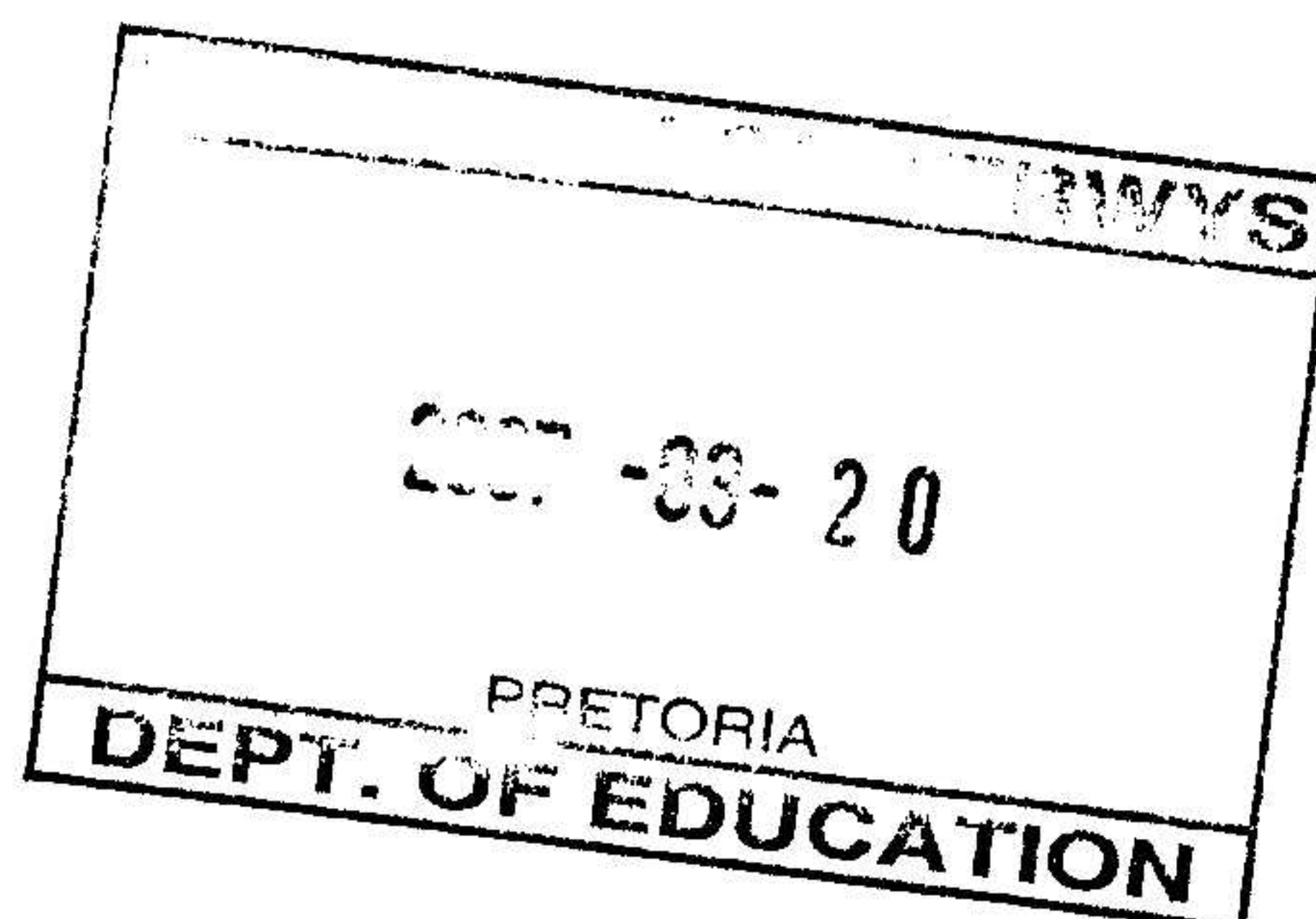
- 4.2 infiltrasietempo tempo van die grond (grondtipe)✓
topografie✓
hoeveelheid water beskikbaar✓
die hoeveelheid soute in die grond✓
waterkwaliteit✓
koste✓
tipe gewas✓
metode van grondbewerking✓

(Enige 5)

(5)

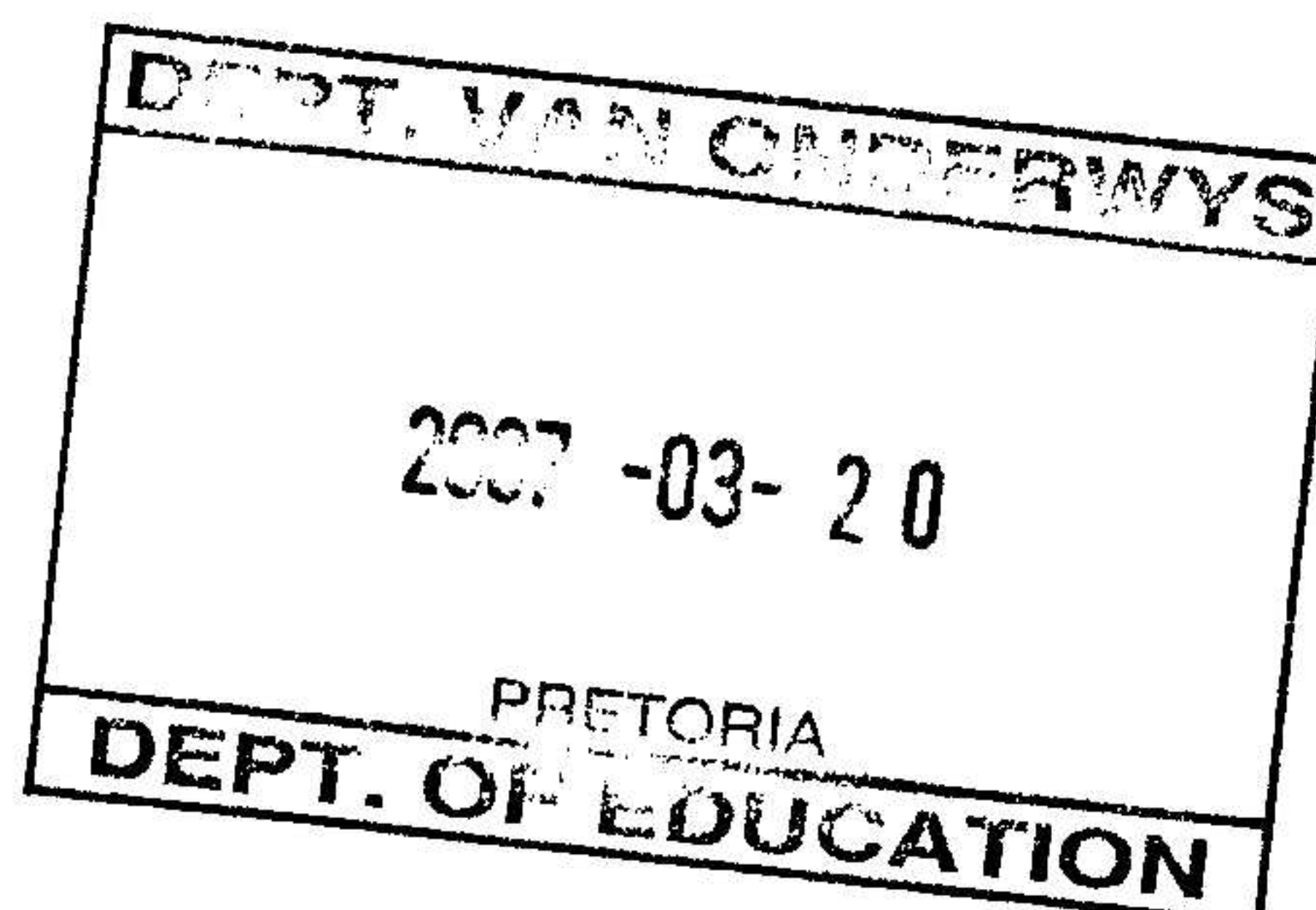


- 4.3 grond stoor en stel water beskikbaar vir gebruik deur plante✓
verskaf lug vir repirasie van plantwortels en mikro-organismes✓
stel plantvoedingstowwe vry vir plante✓
dien as 'n groeimedium vir plante✓
laat waterinfiltrasie toe✓ (5)
- 4.4. beter deurlugting van die grond✓
ontwikkeling van 'n beter wortelstelsel✓
verhoog grondtemperatuur✓
stimuleer microbe aktiwiteit✓
maklik grondbewerking✓
verhoogde infiltrasietempo in die grond✓
verwydering van skadelike stowwe✓ (Enige 6) (6)
- 4.5 totale opgeloste soute (soutinhoud)✓
turbiditeit✓
biologiese materiaal✓
natrium adsorpsieverhouding✓
giftige ione bv boor✓ (Enige 3) (3)
- 4.6 gee plante 'n kans om sade te vorm✓
om voedingstowwe te berg vir hergroei✓
vestiging van jong saailinge✓
herstel van die veld vir die volgende seisoen✓
veld verbetering✓ (Enige 3) (3)
- [25]



VRAAG 5 : LANDBOU-EKONOMIE

- braaipakke✓ (2)
- (b) vrieskas✓ (2)
- trollie✓ (2)
- (c) winkel gebou✓ (2)
- elektriese fasiliteite✓ (2)
- 5.1.2 bederfbaarheid / stoor fasiliteit✓ ✓ (2)
- 5.1.3 totale verlies weens verrotting✓ (2)
- lae pryse✓ (2)
- 5.2 Korttermyn krediet✓
- Bv. Geld gebruik vir goedere benodig in die produksieproses oa. saad, kunsmis, onkruidodders, plaagdodders ens.✓ (slegs een voorbeeld) (2)
- Mediumtermyn krediet✓
- Bv. geld vir die aankoop van lewende hawe, masjienerie, implimente ens.✓ (slegs een voorbeeld) (2)
- Langtermyn krediet✓
- bv. geld vir die aankoop van grond / plaas, oprig van geboue of die bou van 'n dam ens. (slegs een voorbeeld) (2)
- 5.3 Grafiek
- 5.3.1 (a) W – aanbodkurwe✓ (1)
- (b) T – vraagkurwe✓ (1)
- (c) X – surplus by die mark✓ (1)
- (d) Y – tekort by die mark✓ (1)
- 5.3.2 aanbod is gelyk✓ (2)
- aan die vraag✓



5.4	direkte verkope aan die verbruiker✓		
	direkte verkope aan die voedselverwerkingsfabrieke✓		
	direkte verkope aan die groothandelaars✓		
	direkte verkope aan die kleinhandelaars✓		
	verkope deur 'n middelman na verbruikers✓	(Enige 3)	(3)
			[25]
		TOTAAL AFDELING B:	120
		GROOTTOTAAL :	150

