## SECTION A

## QUESTION 1

1.1 Multiple choice

1.1.1 C✓ ✓ (2)

1.1.2 D✓ ✓ (2)

1.1.3 C✓ ✓ (2)

1.1.4 C✓ ✓ (2)

1.1.5 B✓ ✓ (2)

1.1.6 A✓ ✓ (2)

1.1.7 B✓ ✓ (2)

1.1.8 B✓ ✓ (2)

1.1.9 D✓ ✓ (2)

1.1.10 A✓ ✓ (2)

[20]

1.2 Correct terms

1.2.1 Decision making✓ ✓ (2)

1.2.2 Plant succession✓ ✓ (2)

1.2.3 Peristalsis✓ ✓ (2)

1.2.4 Pancreas✓ ✓ (2)

1.2.5 Marketing/advertising✓ ✓ (2)

[10]

1.3 Replacement of word(s)

1.3.1 Proteins✓ ✓ (2)

1.3.2 Oestrus✓ ✓ (2)

1.3.3 Urethra✓ ✓ (2)

1.3.4 Climate✓ ✓ (2)

1.3.5 Free marketing✓ ✓ (2)

[10]

1.4 Matching the columns

1.4.1 D✓ ✓ (2)

1.4.2 H✓ ✓ (2)

1.4.3 C✓ ✓ (2)

1.4.4 A✓ ✓ (2)

1.4.5 B✓ ✓ (2)

[10]

**TOTAL SECTION A: 50**

## SECTION B

## QUESTION 2: ANIMAL NUTRITION

2.1 Digestive tract of the pig

2.1.1 (a) C✓ (1)

Gizzard/Ventriculus/Grandular stomach/Muscular stomach✓ (1)

(1)

(b) A✓ (1)

Crop✓ (1)

(c) F✓ (1)

Small intestine✓ (1)

(d) B✓ (1)

Proventriculus/Glandular stomach✓

2.1.2 Reason: Secretion of gastric juice which contains the following✓ (1)

| Enzyme | End product |
|---|---|
| Pepsin✓ | Proteoses/peptones✓ |
| Renin✓ | Casein✓ |
| Lipase✓ | Fatty acids/glycerol✓ |

(6)

2.2 sufficient mineral nutrients✓

require macro- and micro-elements for growth and reproduction✓

easily digestible carbohydrates✓

starch and sugars are required for energy purposes✓
sufficient nitrogen
required for the synthesis of microbial protein✓ (6)

2.3 Digestibility of feeds:

2.3.1 Amount of dry matter absorbed

= (88% x 10kg) – (77% x 3.5kg)/ 100✓

= (880 – 269.5) / 100✓

= 6.1kg✓

Digestibility co-efficient

= $\frac{6.1kg}{8.8kg \times 100}$✓

2.3.2 the animal is a good converter of food✓
as the digestibility co-efficient is above 50%✓ (2)

2.4 Feedstuffs:

2.4.1 Oats straw/silage/yellow maize meal✓ (any 1) (1)

2.4.2 Salt✓ (1)

2.4.3 Urea✓ (1)

2.4.4 Fishmeal/bone meal✓ (any 1) (1)

2.4.5 Lucerne✓ (1)

2.5 Feeding programme terms:

2.5.1 Balanced ration :
refers to the quantity of feed which provides all nutrients✓
required by the animal per day✓
in the correct form, ratio and quantity✓ (3)

2.5.2 Dry roughage:
feed which per unit of mass contains a large volume✓
and small percentage of digestible nutrients✓
and a large amount of crude fibre✓ (3)

**[40]**

## QUESTION 3 : ANIMAL REPRODUCTION

3.1 Reproductive organs of the cow

3.1.1 A Primary spermatocyte (2n)✓ (1)
B Secondary spermatocyte (n)✓ (1)
C Second meiotic division✓ (1)
D Spermatids (n)✓ (1)
E Sperm✓ (1)



3.1.2 Walls of seminal tubes/seminiferous tubes✓ (1)

3.1.3 Epididymis✓ (1)

3.1.4 No true to type animals/the offspring would not resemble the parents✓ ✓ (2)

3.2 Artificial insemination:

3.2.1 prevents disease transmitted during mating✓
reduces occurrence of sexually transmitted diseases✓
rapid genetic improvement of the herd✓
most economical breeding method✓
semen from different bulls may be used✓
increases commercial value of the herd✓
higher calving percentage✓
semen of overseas bulls may be used✓
seed can be frozen for several years✓
accurate method of progeny testing (Any 5) (5)

3.2.2 opaque✓
milky✓
sticky✓
slimy✓
80% movable✓
85% alive✓
less than 20% abnormal sperm✓ (Any 4) (4)

3.3 Breeding methods:

3.3.1 Cc✓ ✓ (2)

3.3.2 Good conformation/good outward appearance✓ ✓ (2)

3.3.3 Upgrading✓ ✓ (2)

3.3.4 most economical method of improving a herd✓
requires no specialised knowledge✓
possibility of deficient progeny is small✓
new breed is gradually imported into a new environment✓
few adaptation problems ✓ (Any 4) (4)

3.4 Parturition and milk production:

3.4.1 loss of appetite✓
isolate herself from the herd✓
nesting behaviour✓
restlessness✓
signs of discomfort✓
urinates and defaecates frequently✓
leaking milk✓
mucus strings are visible✓ (Any 5) (5)

3.4.2 triggered by stimulation of sensory nerves in the teats✓
having the teats massaged, washing of udder, milking process, familiar milking sounds✓
the hormone oxytocin is released from the pituitary gland during this process✓
transported via the blood to the udder✓
stimulates the myo-epithelial cells and the milk is pushed down into the ducts✓
from there into the teats✓
fear or excitement results in the release of adrenalin which inhibits milk ejection✓ (Any 5) (5)

3.4.3 the nutrients from the feed are used for both milk production✓
and growth of the foetus✓ (2)

**|40|**

## QUESTION 4 :OPTIMAL RESOURCE UTILISATION

4.1 Cultivation:

| | **Bare cultivation** | **Mulch cultivation** | |
|---|---|---|---|
| 4.1.1 Aeration | Heavy implements cause compaction/plough bank/plough pan✓<br>Macro pores destroyed✓ (Any 1) | Very good aeration because there is no compaction✓<br>Macro pores not destroyed✓ (Any 1) | (2) |
| 4.1.2 Compaction | Compacted layer/plough bank/plough pan✓<br>Due to use of heavy machinery✓ (Any 1) | Very little or no compaction✓<br>Little pressure or smearing effect✓<br>(Any 1) | (2) |
| 4.1.3 Soil structure | Deteriorates ✓<br>Pulverisation of soil✓<br>Destruction of soil structure✓ (Any 1) | Improves✓ | (2) |

4.2 helps combat pests and diseases✓
helps to maintain the organic fraction in the soil✓
prevents one-sided utilisation of plant nutrients✓
prevents leaching out of plant nutrients✓
better labour distribution✓
two or more crops can be produced✓
risk of crop failure is spread✓
it decreases slack periods on the farm✓
improves soil conservation practice✓ (Any 5) (5)

4.3 Veld types and management:

4.3.1 Sourveld
the grasses are palatable and nutritious for animals when the plants are young✓
but loses its palatability and nutritional value as it matures✓ (2)

Sweetveld
the grasses are palatable and nutritious to animals✓
throughout all its stages of growth✓ (2)

4.3.2 Selective grazing
animals are grazing normally only palatable species of grasses✓
which results in overgrazing of that particular species✓ (2)

Zero grazing
animals are kept in one place and fed with fodder which has been cut✓
no grazing takes place at all✓ (2)

4.4. Veld management:

4.4.1 Number of camps:
the greater the number of camps available✓
the longer the rest period would be✓ (2)

4.4.2 Condition of veld:
the more trampled the veld/overgrazed/heavily grazed ✓
the longer the rest period✓ (2)

4.4.3 Rainfall:
the more the rainfall✓
the shorter the resting period✓ (2)

4.5 depth of different horizons✓
soil colour✓
mottle✓
soil texture✓
soil structure✓
concretions✓
consistency✓ (Any 5) (5)



4.6 on highly permeable soil✓
on shallow soil with low water capacity✓
on soil where uniform application of water is essential✓
on steep slopes and erosion is a real danger✓
when the stream of water is too small for flood irrigation✓
on a land with different infiltration rates ✓
on uneven land✓ (Any 5) (5)

**|35|**

## QUESTION 5 : AGRICULTURAL ECONOMICS

5.1 Case study

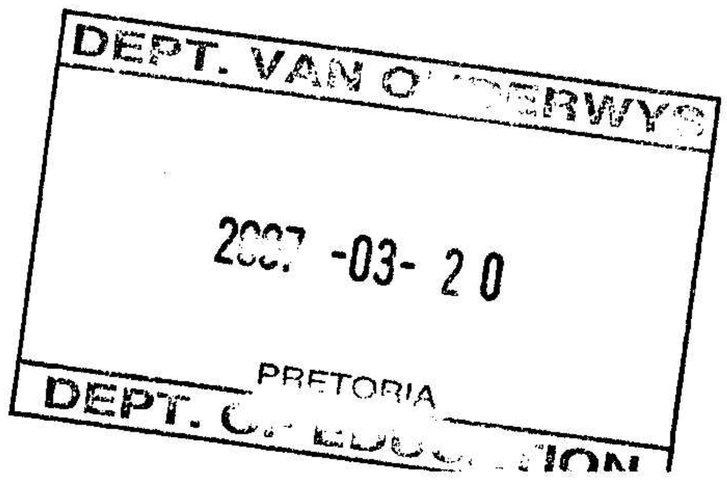
5.1.1 provides agricultural requirements at a discounted price/cheap price✓
provides certain services e.g. ploughing and spraying of orchards✓
provides agricultural insurance✓
provides selling of products in the most profitable way✓
products are standardised and graded✓
due to bulk handling marketing costs per unit decreases✓ (Any 5) (5)

5.1.2 (a) employed during the peak period✓
for repetitive tasks✓
e.g. fruit harvesting✓ (3)

(b) employed on a temporary basis✓
for non-repetitive tasks✓
e.g. erecting security fencing✓ (3)

5.2 Supply and demand:

5.2.1 Demand refers to:
quantity of the product✓
which can be purchased at a given time by consumers✓
at all possible alternative prices✓ (3)



Supply refers to:
the quantity of the product✓
produced or offered to the purchaser/buyer✓
at varying prices✓ (3)

5.2.2 price of the product✓
tastes and preferences of consumers✓
number of consumers✓
real income of consumers✓
prices of competing and complimentary products✓
range of products available to the consumer✓
usefulness of the product✓ (Any 5) (5)

5.2.3 water supply/irrigation✓
consolidation of uneconomic farm units✓
adapting production systems to scientific methods✓ (3)

5.3 Soil as a production factor:

5.3.1 yield/production increases per production factor added✓
up to maximum potential of the soil✓
after which further inputs will not increase yield✓ (Any 2) (2)

5.3.2 depth✓
texture✓
and slope cannot be changed✓
crops must be adapted to the nature of the soil✓ (Any 2) (2)

5.4 Farm profit:

5.4.1 provide training facilities on farm✓
organise learnerships/skills programmes for workers✓
provide skills specialisation✓ (Any 2) (2)

5.4.3 improve working conditions on farm✓
reduce long working hours to acceptable standard✓
provide good remuneration for over-time/incentives✓
introduce modern mechanisation to increase labour productivity✓
increase wages/salaries✓ (Any 2) (2)

[35]

**TOTAL SECTION B: 150**

**GRAND TOTAL : 200**

## AFDELING A

## VRAAG 1

1.1 Meerkeusige vrae

1.1.1 C✓ ✓ (2)

1.1.2 D✓ ✓ (2)

1.1.3 C✓ ✓ (2)

1.1.4 C✓ ✓ (2)

1.1.5 B✓ ✓ (2)

1.1.6 A✓ ✓ (2)

1.1.7 B✓ ✓ (2)

1.1.8 B✓ ✓ (2)

1.1.9 D✓ ✓ (2)

1.1.10 A✓ ✓ (2)

[20]

1.2 Korrekte terme

1.2.1 Besluitneming✓ ✓ (2)

1.2.2 Plantsuksessie✓ ✓ (2)

1.2.3 Peristalsis✓ ✓ (2)

1.2.4 Pankreas✓ ✓ (2)

1.2.5 Bemarking / Advertering✓ ✓ (2)

[10]

1.3 Vervanging van woord (e)Replacement of word(s)

1.3.1 Proteïen✓ ✓ (2)

1.3.2 Bronstigheid✓ ✓ (2)

1.3.3 Blaaspyp / Uretra✓ ✓ (2)

1.3.4 Klimaat✓ ✓ (2)

1.3.5 Vrye bemarking✓ ✓ (2)

[10]

1.4 Pas die kolomme

1.4.1 D✓ ✓ (2)

1.4.2 H✓ ✓ (2)

1.4.3 C✓ ✓ (2)

1.4.4 A✓ ✓ (2)

1.4.5 B✓ ✓ (2)

[10]

**TOTAAL AFDELING A: 50**

## AFDELING B

## VRAAG 2:DIEREVOEDING

2.1 Spysverteringskanaal van die vark

2.1.1 (a) C✓ (1)

Ventrikulus/Spiermaag✓ (1)

(b) A✓ (1)

Krop✓ (1)

(c) F✓ (1)

Dunderm✓ (1)

(d) B✓ (1)

Proventrikulus/Kliermaag✓ (1)

2.1.2 Rede: Afskeiding van maagsap wat die volgende bevat✓ (1)

| Ensiem | Eindproduk |
|---|---|
| Pepsien✓ | Proteoses/peptones✓ |
| Rennien✓ | Kaseïen✓ |
| Lipase✓ | Vetsure/gliserol✓ |

(6)

2.2 voldoende minerale voedingstowwe✓
benodig makro- en mikro-elemente vir groei enh reproduksie✓
maklik verteerbare koolhidrate✓
stysel en suikers word benodig vir energie✓
voldoende stikstof benodig vir die sintese van mikro proteïen✓ (6)

2.3 Verteerbaarheid van voere:

2.3.1 Hoeveelheid droëmateriaal geabsorbeer
= (88% x 10kg) – (77% x 3.5kg)/ 100✓
= (880 – 269.5) / 100✓
= 6.1kg✓

Koeffisiënt van verteerbaarheid
= $\frac{6.1kg}{8.8kg \times 100}$✓
= 69.3%✓ ✓ (6)

2.3.2 die dier het 'n goeie omskakeling van voer✓
aangesien die koefisiënt van verteerbaarheid bo 50% is✓ (2)

2.4 Voere:

2.4.1 Hawerstrooi/geelmieliemeel✓ (enige 1) (1)

2.4.2 Sout✓ (1)

2.4.3 Ureum✓ (1)

2.4.4 Vismeel/beenmeel✓ (enige 1) (1)

2.4.5 Lusern✓ (1)

2.5 Terme oor voedingsprogramme:

2.5.1 Gebalanseerde rantsoen :
verwys na die hoeveelheid voer wat alle voedingstowwe verskaf✓
wat deur 'n dier per dag benodig word✓
in die korrekte vorm, verhouding en hoeveelheid✓ (3)

2.5.2 Droë ruvoer:
voer wat per eenheid massa 'n groot volume beslaan✓
'n klein persentasie verteerbare voedingstowwe bevat✓
en 'n groot hoeveelheid ruvesel✓ (3)

**[40]**

## VRAAG 3 : DIERE REPRODUKSIE

3.1 Voortplantingsorgane van die koei

3.1.1 A Primêre spermatosiet (2n)✓ (1)
B Sekondêre spermatosiet (n)✓ (1)
C Tweede meïotiese deling✓ (1)
D Spermatied (n)✓ (1)
E Sperm✓ (1)

3.1.2 Wande van die seminale buisies✓ (1)

3.1.3 bybal / epididymis✓ (1)

3.1.4 Nie raseg nie / die nageslag sal nie oorkomste toon met die ouers nie✓ ✓ (2)

3.2 Kunsmatige inseminasie:

3.2.1 Voorkom siektes wat tydens paring oorgedra word✓
Beperk die voorkoms van seksueel oordraagbare siektes✓
Vinnige genetiese verbetering van die kudde✓
Mees ekonomiese teelmetode✓
semen van verskillende bulle kan gebruik word✓
toename in die kommersiële waarde van kudde✓
hoër kalfpersentasie✓
semen van oorsese bulle kan gebruik word✓
saad kan vir verskeie jare gevries word✓
akkurate metode van nageslagtoetsing is moontlik✓ (Enige 5) (5)

3.2.2 ondeursigtig✓
melkerig✓
klewerig✓
slymerig✓
80% beweeglik✓
85% lewendig✓
minder as 20% abnormale sperme✓ (Enige 4) (4)

3.3 Teelmetodes:

3.3.1 Cc✓ ✓ (2)

3.3.2 Goeie konformasie / goeie uiterlike voorkoms✓ ✓ (2)

3.3.3 Opgradering✓ ✓ (2)

3.3.4 Mees ekonomiese metode om 'n kudde te verbeter✓
Benodig geen gespesialiseerde kennis nie✓
Die moontlikheid vir tekorkomings in die nageslag is klein✓
Nuwe ras word geleidelik in 'n nuwe omgewing ingebring✓
Min aanpassingsprobleme✓ (Enige 4) (4)

3.4 Kalwing en melkproduksie:

3.4.1 Verlies aan eetlus✓
Isoleer haarself van die res van kudde✓
Soek 'n spesiale plekkie - gedrag✓
rusteloos✓
tekens van ongemak✓
urineer en mis dikwels✓
lekkende melk✓
slymstringe sigbaar✓ (Enige 5) (5)

3.4.2 Aan die gang gesit deur stimulering van sensoriese senuwees in die spene✓
Waar spene gehanteer word, uier gewas word, die melkproses, bekende geluide by melkstal✓
Die hormoon oksitosien word vrygestel vanaf die pituêre klier tydens die proses✓
In die bloedstroom vervoer na die uier✓
Stimuleer die myo-epiteel selle en melk word in die uierkanale ingestoot✓
Van daar tot in die speenkanale✓
Skok of opgewondenheid lei tot die vrystelling van adrenalien wat die melkvrystelling inhibeer✓ (Enige 5) (5)

3.4.3 Die voedingstowwe van die voer word gebruik vir beide melkproduksie✓
en die groei van die fetus✓ (2)

**|40|**

## VRAAG 4 :OPTIMALE HULPBRONBENUTTING

4.1 Grondbewerking:

| | **Skoonbewerking** | **Deklaagbewerking** | |
|---|---|---|---|
| 4.1.1 Deurlugting | Swaar implimente veroorsaak kompaktering /ploegbank✓<br>Makroporieë word vernietig✓<br>(Enige 1) | Baie goeie deurlugting omdat daar geen kompaktering plaasvind nie✓<br>Makroporieë word nie vernietig nie✓<br>(Enige 1) | (2) |
| 4.1.2 Kompaksie | Gekompakteerde laag /ploegbank ✓<br>weens swaar werktuie✓<br>(Enige 1) | Baie min of geen kompaktering✓<br>Min druk of smeringseffek✓<br>(Enige 1) | (2) |
| 4.1.3 Grondstruktuure | Verswak ✓<br>Verpoeiering van grond✓<br>Vernietiging van grondstruktuur✓<br>(Enige 1) | Verbeter✓ | (2) |

4.2 Help om plae en siektes te beheer✓

Help om organiese fraksie in die grond te handhaaf✓

Voorkom die eensydige benutting van voedingstowwe uit die grond✓

Voorkom die loging van voedingstowwe✓

beter arbeidsverspreiding✓

twee of meer gewasse kan verbou word✓

risiko van gewasverliese word versprei✓

dit verminder die afperiodes op die plaas✓

verbeter grondbewaringspraktyke✓ (Enige 5) (5)



4.3 Veldtipes en bestuur:

4.3.1 Suurveld

die grasse is smaaklik en voedsaam vir diere as die plante jonk is✓

maar verloor sy smaaklikheid en voedingswaarde as dit uitgegroei is✓

(2)

Soetveld

Die grasse is smaaklik en voedsaam vir diere✓

Gedurende die hele groeiperiode van die grasse✓ (2)

4.3.2 Selektiewe beweiding

Diere benut slegs die smaaklik grasspesies✓

Wat lei tot die oorbeweiding van die bepaalde grasspesie✓ (2)

Geen beweiding

Diere word aangehou op 'n plek en hooi gevoer wat van weiveld gesny is✓

Geen beweiding vind dus plaas nie✓ (2)

4.4. Veldbestuur:

4.4.1 Aantal kampe:

hoe meer kampe beskikbaar✓

Hoe langer sal die periode wees✓ (2)

4.4.2 Toestand van die veld:

hoe meer vertrap die veld / oorbewei /swaar bewei ✓

Hoe langer die rusperiode✓ (2)

4.4.3 Reënval:

hoe meer die reënval✓

Hoe korter die rusperiode✓ (2)

4.5 diepte van die verskillende horisonte✓

grondkleur✓

vlekke✓

grondtekstuur✓

grondstruktuur✓

konkresies✓

konsistensie✓



(Enige 5) (5)

4.6 Op hoogs deurdringbare grond✓

Op vlak grond met 'n lae waterkapasiteit✓

Op grond waar die univorme toediening van water noodsaaklik is✓

Op steil hellings waar erosie 'n wesenlike gevaar is✓

Waar die watertoevoer te klein is vir vloedbesproeiing✓

Op grond met verskille in tempo van infiltrasie ✓

Op ongelyk grond✓ (Enige 5) (5)

**|35|**

## VRAAG 5 : LANDBOU-EKONOMIE

5.1 Gevallestudie

5.1.1 Verskaf landboubehoeftes teen afslagpryse / goedkoop pryse✓

Verskaf sekere dienste bv. ploeg en spuit van boorde✓

verskaf landbouversekering ✓

verskaf die verkope van produkte op die mees winsgewende manier✓

produkte word gestandaadiseer en gegradeer✓

weens die massahantering word die bemarkingskoste per eenheid verminder✓ (Enige 5) (5)

5.1.2 (a) aangestel tydens die piek periodes✓

vir take wat periodiek herhaal word✓

bv. vrugteoes✓ (3)

(b) aangestel op 'n tydelike basis✓

vir eenmalige taak✓

bv. Die oprigting van veiligheidsdraad✓ (3)

5.2 Vraag en aanbod:

5.2.1 Vraag verwys na:

Hoeveelheid van die produk✓

Wat op enige gegewe tyd deur verbruikers gekoop word✓

Teen alle moontlike alternatiewe pryse✓ (3)

Aanbod verwys na:
Die hoeveelheid van 'n produk✓
Geproduseer of aangebied aan die koper✓
Teen variërende pryse✓ (3)

5.2.2 Prys van die produk✓
Smake en voorkeure van die verbruikers✓
Getal verbruikers✓
Reële inkomste van verbruikers✓
Pryse van compiterende en komplimenterende produkte✓
Reeks produkte beskikbaar vir die verbruiker✓
Bruikbaarheid van die produk✓ (Enige 5) (5)

5.2.3 water voorsiening / besproeiing✓
konsolidering van onekonomiese boerdery eenhede✓
aanpassing van produksiesisteme tot wetenskaplike metodes✓ (3)

5.3 Grond as 'n produksiefaktor:

5.3.1 opbrengs/produksie verhoog per produksiefaktor toegevoeg✓
tot by 'n maksimum potensiaal vir die grond✓
waarna ekstra insette nie die opbrengs sal verhoog nie✓ (Enige 2) (2)

5.3.2 diepte✓
tekstuur✓
en helling kan nie verander word nie✓
gewasse moet aangepas word by die geaardheid van die grond✓ (Enige 2) (2)



5.4 Plaaswins:

5.4.1 Verskaf opleidingsfasiliteite op die plaas✓
Reël vir vaardigheidsopleidings/vaardigheidsprogramme vir die werkers✓
Verskaf spesialisering van vaardighede✓ (Enige 2) (2)

5.4.2 Verskaf behoorlike bestuur en toesig✓
Erken en beloon werkers vir uitstaande werk verrig✓ (2)

5.4.3 Verbeter die werkstoestande op die plaas✓

Verminder die lang werksure na 'n aanvaarbare standaard✓

Verskaf goeie betaling vir oortyd / aansporings✓

Verhoog moderne meganisasie om arbeidsproduktiwiteit te verhoog✓

Verhoog lone / salarisse✓ (Enige 2) (2)

[35]

**TOTAAL AFDELING B: 150**

**GROOTTOTAAL : 200**