These marking guidelines consist of 10 pages.
## SECTION A

### QUESTION 1

1.1 1.1.1 B ✨✨  
1.1.2 D ✨✨  
1.1.3 C ✨✨  
1.1.4 A ✨✨  
1.1.5 B ✨✨  
1.1.6 A ✨✨  
1.1.7 C ✨✨  
1.1.8 C ✨✨  
1.1.9 A ✨✨  
1.1.10 C ✨✨  

(10 x 2)  (20)

1.2 1.2.1 B only ✨✨  
1.2.2 Both A and B ✨✨  
1.2.3 A only ✨✨  
1.2.4 None ✨✨  
1.2.5 None ✨✨  

(5 x 2)  (10)

1.3 1.3.1 Gross energy/GE ✨✨  
1.3.2 Vector ✨✨  
1.3.3 Placenta retention/retained placenta ✨✨  
1.3.4 Spermatogenesis ✨✨  
1.3.5 Pedometer ✨✨  

(5 x 2)  (10)

1.4 1.4.1 Vitamin A/retinol ✨  
1.4.2 Neck/head clamp/head gate ✨  
1.4.3 Urethra ✨  
1.4.4 Lactation ✨  
1.4.5 Impotence ✨  

(5 x 1)  (5)

**TOTAL SECTION A:**  45
SECTION B

QUESTION 2: ANIMAL NUTRITION

2.1 Feed intake

2.1.1 Indication of the name of the animal
COLUMN A - Pig ✓
COLUMN B - Fowl/chicken/poultry ✓

2.1.2 Reason
COLUMN A
- Chemical digestion starts from the mouth through amylase ✓
- Ingest food using the lips and tongue ✓
- The teeth grind the food ✓
- Food is pushed down the oesophagus into the stomach where it is digested further by enzymes ✓ (Any 1)
COLUMN B
- Animal ingest food by pecking ✓
- Food is moistened, softened and stored ✓
- Physical and chemical digestion occur in stomach ✓ (Any 1)

2.1.3 Stating the structural difference in the large intestines of animals
COLUMN A - There is one caecum/blind gut/colon of the pig is long/there is a rectum ✓
COLUMN B - There are two caeca/blind gut/colon of a chicken is short/no rectum ✓

2.2 Parts of the alimentary canal

2.2.1 Identification of the letter
(a)  C ✓
(b)  A ✓

2.2.2 TWO digestive juices deposited in small intestines
- Bile ✓
- Pancreatic juice ✓

2.2.3 Fat digestive enzyme secreted in pancreas
Lipase ✓

2.2.4 TWO reasons for breaking down of fat by bile
- To increase the surface area ✓
- Allows lipase to work better/to enhance chemical digestion ✓
- To improve the absorption of fatty acids/assists with the absorption of fat-soluble vitamins A,D,E,K ✓ (Any 2)
2.3 Mineral deficiency

2.3.1 Naming the mineral deficient in animal
Phosphorus/P ✓ (1)

2.3.2 Name of the condition
Pica ✓ (1)

2.3.3 Indication of the feed
Bone meal/mineral lick ✓ (1)

2.4 Feeds

2.4.1 Classification of feeds
Maize meal - Concentrates ✓ (1)
Maize stalk - Roughages ✓ (1)

2.4.2 Importance of feeding roughage in
(a) Young ruminant
Stimulate the development of rumen/fore stomach ✓ (1)
(b) Adult ruminant
• Normal functioning of the rumen/prevents bloating ✓
• Stimulates production of butterfat in milk ✓
• Supply bulkiness to the ration ✓
• Provides energy for maintenance ✓ (Any 1) (1)

2.4.3 Calculation of the ratio to which maize meal and fish meal be mixed to get a feed with 15% DP

Maize meal 9% 21 parts ✓

Fish meal 36% 6 parts ✓

Maize meal : Fish meal 21 : 6 ✓ OR Fishmeal : Maize meal 6 : 21 ✓ (4)
2.5 Digestibility coefficient

2.5.1 Digestibility co-efficient

\[
\text{DM} = 15 \text{ kg} \times 84\% \times (0.84) = 12.6 \text{ kg} \quad \text{OR} \quad 84 \times 15 \text{ kg} = 12.6 \text{ kg} \quad \text{OR} \quad \frac{84}{100} \times 15 \text{ kg} = 12.6 \text{ kg} \quad \checkmark
\]

\[
\text{DC} = \frac{\text{Dry material intake (kg)} - \text{Dry mass of manure (kg)} \times 100}{\text{Dry material intake (kg)}}
\]

\[
= \frac{12.6 \text{ kg} - 3.5 \text{ kg} \times 100}{12.6 \text{ kg}} \quad \checkmark
\]

\[
= 72.2 \% \quad \checkmark
\]

2.5.2 The percentage of the excreted material

27.8% \quad \checkmark

(1)

2.6 Fodder flow programme

2.6.1 The month in which to reduce the number of farm animals

June \quad \checkmark

(1)

2.6.2 Reason

- Feed availability is at its lowest (100 kg/ha) \quad \checkmark
- More supplementary feed required (8 kg/animal/day) \quad \checkmark (Any 1)

(1)

2.6.3 Calculation of the total feed available for April (in tons) if 5 ha are available for grazing

\[
800 \text{ kg/ha} \times 5 \text{ ha} = 4000 \text{ kg} \quad \text{OR} \quad \frac{800 \text{ kg/ha}}{1000 \text{ kg}} \quad \checkmark
\]

\[
= \frac{4000 \text{ kg}}{1000 \text{ kg}} = 0.8 \text{ tons} \times 5 \text{ ha} \quad \checkmark
\]

\[
= 4 \text{ tons} \quad \checkmark
\]

(3)

[35]
QUESTION 3 : ANIMAL PRODUCTION, PROTECTION AND CONTROL

3.1 Heat stress in dairy cattle

3.1.1 TWO visible ways cattle use to decrease the effects of heat
- Standing under trees/shade for protection from sun ✓
- Standing inside the water to cool the body ✓
- Standing apart/away from each other ✓

(Any 2) (2)

3.1.2 TWO importance of shelter for animals
- Increases young animals’ survival rate ✓
- Protects animals from predators/theft ✓
- Enables control of diseases and parasites ✓
- Provides an ideal temperature/protects animal against adverse weather conditions ✓
- Prevents dehydration ✓
- Maximize production ✓

(Any 2) (2)

3.1.3 TWO requirements for the vehicle transporting farm animals
- Floors should not be slippery ✓
- Adequate ventilation ✓
- Rails must be high and strong ✓
- No sharp edges that can harm/hurt animals ✓
- Vehicles should be clean/hygienic ✓
- Must have enough space ✓

(Any 2) (2)

3.2 The effect of environmental temperature

3.2.1 The farm product
Milk ✓

(1)

3.2.2 Description of the relationship between dry matter intake, milk yield and water intake
With increased environmental temperatures dairy cows will eat less feed ✓ less milk will be produced ✓ and will drink more water ✓

(3)

3.3 Production systems

3.3.1 Identification of the production systems
(a) Farmer B ✓
(b) Farmer A ✓

(1)

3.3.2 Justification
(a) Extensive production system
It took the herd longer to reach the live weight of 550 kg/ faster growth rate ✓

(1)

(b) Intensive production system
It took the herd less time to reach the live weight of 550 kg/ faster growth rate ✓

(1)

3.3.3 A disadvantage in relation to input costs
Input costs are high/it is expensive ✓

(1)
3.4  FMD in farm animals

3.4.1  The pathogen causing FMD
Virus ✓ (1)

3.4.2  TWO main symptoms of FMD in farm animals
- Blistery-like lesions ✓
- Painful ulcers ✓
- Sticky, foamy salivation ✓
- Severe lameness/unable to walk/limping ✓
- Nasal discharge ✓ (Any 2) (2)

3.4.3  TWO roles of state in controlling animal diseases
- Public awareness/report the outbreak of FMD ✓
- Quarantine services/separation/isolation of infected animals ✓
- Veterinarian services ✓
- Banning of exports ✓ (Any 2) (2)

3.4.4  TWO economic impact of FMD
- International trade decreases/export bans ✓
- Reduce food security ✓
- Decreased production ✓
- Loss of income/profit/jobs ✓
- Costs to control, prevent and treat animals are high ✓
- Death of an animal/stock losses ✓ (Any 2) (2)

3.5  Methods used to administer medication to farm animals

3.5.1  Identification of the pictures
- Picture A ✓
- Picture B ✓
- Picture D ✓ (Any 2) (2)

3.5.2  Identification of the pictures
- Picture B ✓
- Picture C ✓ (2)

3.6  Different organisms harmful to farm animals

3.6.1  Term referring to the organisms in pictures A, B, C and D
Parasites ✓ (1)

3.6.2  Classification of the organisms
- PICTURE B - External/ecto parasite ✓ (1)
- PICTURE C - Internal/endo parasite ✓ (1)

3.6.3  Identification of the letter
(a) Redwater - B/Blue tick ✓ (1)
(b) Rift Valley Fever (RVF) - A/mosquito ✓ (1)
(c) Heartwater - D/Bont tick ✓ (1)
3.7 THREE plants that are poisonous to farm animals
- Thorn apple/devil’s apple ✓
- Poison bulb/slangkop ✓
- Poison ivy ✓
- Maize fungus ✓
- Lantana camara ✓
- Tulip ✓
- Seneciosis ✓
- Gousiektebossie ✓
- Diplodiosia ✓
- Poison leaf/gifblaar ✓
- Geeldikkop ✓
- Gousieke ✓
- Vermeersieke ✓

(Any 3) [35]

QUESTION 4: ANIMAL REPRODUCTION

4.1 Female reproductive system

4.1.1 Identification of the TWO secondary sex organs
- B ✓
- C ✓
- D ✓
- E ✓

(Any 2) [2]

4.1.2 Providing the letter
(a) The site of fertilisation - B ✓
(b) Glands secreting nutrients - C ✓

[1]

4.1.3 TWO functions of the cervix (Part D)
(a) Opens to allow semen passage to the uterus ✓
(b) Closes the uterus through the thick mucus secretion/mucus plug to prevent microbial infection of the uterus ✓

[1]

4.2 Hormone levels

4.2.1 Definition of the concept oestrus
The period when non-pregnant female animals ✓ will be receptive to male animals/will allow mating ✓

[2]

4.2.2 Indication whether the female farm animal is pregnant or not
The female animal is not pregnant ✓

[1]

4.2.3 Reason
The animal is showing a normal oestrus cycle/the level of progesterone is decreasing/the level of oestrogen is increasing/re-appearance of oestrus ✓

[1]

4.2.4 Indication of the levels of FSH
FSH level will be high ✓

[1]
4.3  **Bar graph**

4.3.1  **Bar graph showing the fat and protein percentages from weeks 5 to 25**

![Bar graph showing the fat and protein percentages from weeks 5 to 25](image)

**CRITERIA/RUBRIC/MARKING GUIDELINES**
- Correct heading ✓
- X-axis: correct calibrations and labelled (Weeks) ✓
- Y-axis: correct calibrations and labelled (Fat and protein) ✓
- Correct unit (%) ✓
- Combined bar graph ✓
- Accuracy ✓  

(6)

4.4  **Synchronisation of oestrus**

4.4.1  **Identification of the process**

Synchronisation of oestrus ✓  

(1)

4.4.2  **TWO techniques/methods to induce synchronisation of oestrus**

- Prostaglandin injection ✓
- Synthetic progesterone/oestradiol injection ✓
- Gonadotropin- releasing hormone/GnRH injection ✓
- Vaginal insertion (CIDR) ✓
- MGA/PG mixed with feed ✓  

(Any 2)  

(2)
4.4.3 TWO disadvantages of the synchronisation of oestrus
- High management inputs/skills/technology are required ✓
- Adequate facilities are required ✓
- High costs/expensive ✓
- Labour intensive ✓
- Time consuming ✓
- Pregnancy tests must be done frequently ✓

4.5 Re-arrangement of the stages of mating in sequential order
- C ✓  (1)
- D ✓  (1)
- A ✓  (1)
- E ✓  (1)
- B ✓  (1)

4.6 Parturition
4.6.1 The stage of parturition in the diagram
- Expulsion/ejection of the foetus ✓
- Delivery ✓

4.6.2 Term for birth difficulty
Dystocia ✓

4.6.3 TWO problems with the calf
- Calves with high birth weights/large calves ✓
- Bull calves normally have higher birth weights ✓
- Malformed calves/congenital defects/hydrocephalus ✓
- Multiple births/twins ✓
- Incorrect position of the calf/posterior presentation ✓

4.7 Multiple births
4.7.1 Identification of the type of multiple births
(a) A - Identical/monozygotic twins ✓  (1)
(b) B - Fraternal/non-identical/dizygotic twins ✓  (1)

4.7.2 Differentiation between
Monozygotic - Formed from the fertilisation of a single ovum ✓  (1)
Dizygotic - Formed from the fertilisation of two different ova ✓  (1)

TOTAL SECTION B: 105
GRAND TOTAL: 150