These marking guidelines consist of 10 pages.
SECTION A

QUESTION 1

1.1 1.1.1 C ✓ ✓
     1.1.2 D ✓ ✓
     1.1.3 A ✓ ✓
     1.1.4 D ✓ ✓
     1.1.5 C ✓ ✓
     1.1.6 B ✓ ✓
     1.1.7 B ✓ ✓
     1.1.8 D ✓ ✓
     1.1.9 A ✓ ✓
     1.1.10 C ✓ ✓ (10 x 2) (20)

1.2 1.2.1 None ✓ ✓
     1.2.2 Both A and B ✓ ✓
     1.2.3 A only ✓ ✓
     1.2.4 B only ✓ ✓
     1.2.5 A only ✓ ✓ (5 x 2) (10)

1.3 1.3.1 Popping/micronising/roasting ✓ ✓
     1.3.2 Homoeothermic/endothermic ✓ ✓
     1.3.3 Superovulation ✓ ✓
     1.3.4 Buffer ✓ ✓
     1.3.5 Progesterone ✓ ✓ (5 x 2) (10)

1.4 1.4.1 Cardiac ✓
     1.4.2 Blue ✓
     1.4.3 Hypoplasia ✓
     1.4.4 Amnion ✓
     1.4.5 Semen straw ✓ (5 x 1) (5)

TOTAL SECTION A: 45
SECTION B
QUESTION 2: ANIMAL NUTRITION

2.1 An alimentary canal of a farm animal

2.1.1 Classification of the animal
Non-ruminant ✓ (1)

2.1.2 Reason visible from the diagram
It has a simple/single/monogastric stomach ✓ (1)

2.1.3 TWO functions of the digestive juice in A
• Changes the pH from acid to alkaline/helps to neutralise the acid from the gastric juices ✓
• Increases the solubility of fats ✓
• Emulsification of fats ✓
• Promotes the absorption of fatty acids and glycerol ✓
• Assists with the absorption of fat-soluble vitamins ✓
• Acts as an antiseptic ✓
• Acts as a detoxifying agent ✓
• Activates lipase ✓
• Lubrication of the alimentary canal ✓
• Enhances peristalsis ✓ (Any 2) (2)

2.1.4 Enzyme digesting fats
Lipase ✓ (1)

2.2 Types of feeds

2.2.1 Classification of feed types
A - Concentrates ✓ (1)
B - Roughages ✓ (1)

2.2.2 Group of feed type C
Protein rich feeds ✓ (1)

2.2.3 TWO examples of feed type D
• Maize meal ✓
• Oats meal ✓
• Barley meal ✓
• Sorghum meal ✓
• Rye meal ✓
• Wheat meal ✓ (Any 2) (2)

2.2.4 Justification of feeding feeds labelled B to ruminants
• Roughages help to prevent bloating ✓
• Supply the necessary bulkiness of their ration ✓
• Enhance rumen development and functioning ✓
• Good roughages stimulate production and growth ✓
• Good roughages are a source of minerals ✓ (Any 2) (2)
2.3 **Nutritional composition of feeds**

2.3.1 **Most suitable feed for young growing farm animals**
Feed B ✓ (1)

2.3.2 **Reason for the answer in QUESTION 2.3.1**
- Feed has a narrow nutritive ratio ✓
- Rich in proteins necessary for growth ✓
- Has more protein than carbohydrates and fats ✓ (Any 1) (1)

2.3.3 **Percentage of digestible non-nitrogen nutrients in feed A**
\[32\% + 38\% = 70\%\] ✓ (2)

2.4 **Digestibility of a hay**

2.4.1 **Comment on the suitability of the hay**
- Not suitable ✓ (1)

**Reason**
- Has a high fibre content/hay is poorly digestible/45% ✓
- Cannot be fed alone/needs supplementation ✓
- Low protein content ✓ (Any 1) (1)

2.4.2 **TWO measures to improve the digestibility of hay**
- Supplementation with NPN ✓
- Supplementation with molasses ✓
- Treatment with agents that improve its nutritive value ✓
- Milling ✓
- Pelleting ✓
- Softening ✓ (Any 2) (2)

2.5 **Fodder flow programme**

2.5.1 **TWO problems to be encountered by the farmer**
- Shortage/deficit of feed is 174 000kg /feed supply during dry season is 216 000kg whilst feed required is 390 000kg ✓
- Increased consumption due to pregnancy and lactation ✓ (2)

2.5.2 **ONE precautionary measure a farmer needs to take**
- Store feed/feed reserve for the dry season ✓
- Reschedule the breeding season to fall during wet season ✓
- Reduce the number of animals before dry season/culling ✓
- Good pasture/fodder flow management practises ✓ (Any 1) (1)
2.5.3 **Amount of feed required per month**  
100 x 21kg x 30 = 63 000kg  
= 63 000kg  
1000  
= 63 tons  

**OR**  
360 000kg + 390 000kg = 750 000kg  
= 62 500kg  
1000  
= 62,5/63 tons  

(3)

2.6 **Feed components**

2.6.1 **Feed nutrient supplying most energy**  
Fats  

(1)

2.6.2 **Units of measuring energy**  
Mega joule/MJ/kilojoule/kJ/Joule/J  

(1)

2.6.3 **TWO reasons for calculating energy value of feeds to a farmer**  
• To determine the feeding standards  
• To be able to provide a recommended diet  
• Helps in the formulation of rations  
(Any 2)  

(2)

2.7 **Minerals and vitamins**

2.7.1 **Completion of missing information**  
A Zinc/Zn  
B Metritis/inflammation of the uterus  
C Stiff lamb/muscle dystrophy/white muscle  

(1)

(1)

(1)

2.7.2 **Methods of supplementing nutrients**  
(a) Injections/supplementary ration  
(b) Dissolve them in drinking water/dosing  

(2)  

[35]

**QUESTION 3: ANIMAL PRODUCTION, PROTECTION AND CONTROL**

3.1 **Pie chart on the size of the area, the number and type of farm animals**

3.1.1 **Animal under intensive conditions**  
Sheep  

(1)

3.1.2 **Reason for the answer in QUESTION 3.1.1**  
• 100 sheep are kept on a small area  
**OR**  
• A large number of sheep is kept on a small area  

(1)
3.1.3 Identification of farm animals
(a) Poultry ✓ (1)
(b) Cattle/goats ✓ (1)
(c) Sheep/goats ✓ (1)

3.1.4 Calculation of the % of sheep

\[
\frac{25 + 100 + 30 + 10}{165} \times 100 = \frac{165}{60.6\%} ✓ (3)
\]

3.2 Animal diseases

3.2.1 Animal diseases
A - Anthrax ✓ (1)
B - Vaccination/inoculation ✓ (1)
C - Mosquitoes ✓ (1)
D - Blood stained nasal discharge/abortions/fever ✓ (1)
E - Red/brown urine/fever ✓ (1)

3.2.2 Role of the state
Vaccination/inoculation ✓ (1)

3.2.3 TWO duties of stock owners to prevent the spread of deadly diseases
- Burn the carcasses ✓
- Dispose of all the manure/bedding/ other contaminated materials ✓
- Clean/disinfect housing ✓
- Report to the authorities ✓
- Quarantine/isolate affected animals ✓
- Treat animals with antibiotics ✓
- Vaccination/inoculation ✓ (Any 2) (2)

3.3 Measures by the state

3.3.1 Hygiene/legislation ✓ (1)

3.3.2 Quarantine/ban on imports/legislation ✓ (1)

3.3.3 Reporting notifiable disease to authorities/veterinary services/SAPS/ legislation/destroy infected animals ✓ (1)

3.4 Data is captured in a graph

3.4.1 Deduction from the graph the range it took lambs to reach 1,8 kg
From day 8 to 24 ✓ (1)
3.4.2 **The tabulation of data**

The table below shows the weight gain of lambs over a period of 40 days ✓

<table>
<thead>
<tr>
<th>Days</th>
<th>Weight gain (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>400</td>
</tr>
<tr>
<td>8</td>
<td>400</td>
</tr>
<tr>
<td>12</td>
<td>1 200</td>
</tr>
<tr>
<td>16</td>
<td>1 200</td>
</tr>
<tr>
<td>20</td>
<td>✓ 1 200</td>
</tr>
<tr>
<td>24</td>
<td>1 800</td>
</tr>
<tr>
<td>28</td>
<td>1 800</td>
</tr>
<tr>
<td>32</td>
<td>1 800</td>
</tr>
<tr>
<td>36</td>
<td>1 000</td>
</tr>
<tr>
<td>40</td>
<td>0</td>
</tr>
</tbody>
</table>

**Criteria/rubric/marking guidelines**
- Correct heading ✓
- Correct labelling of days and weight gain ✓
- Populated table ✓
- Correct unit (g) ✓
- Correct reading of the days ✓
- Correct reading of the weight gain ✓ (6)

3.5 **Structures, apparatus and appliances used to handle and manage farm animals**

3.5.1 Fence ✓ (1)

3.5.2 Rope/halter/immobiliser/chute/crush ✓ (1)

3.5.3 Elastrator/rubber ring/burdizzo/surgical blade/knife ✓ (1)

3.5.4 Shed/housing ✓ (1)

3.6 **External parasites**

3.6.1 **Identification of the external parasite**

Mite ✓ (1)

3.6.2 **The symptom of a severe infestation of the parasite**

Mange/scab ✓ (1)

3.6.3 **One visible sign of the symptom mentioned in QUESTION 3.6.2**
- Severe itching/rubbing/scratching/skin irritation ✓
- Wool/hair loss ✓
- Dermatitis/inflammation of the skin ✓
- Hairless patches/lesions ✓
- Animal does not feed well/weight loss ✓ (Any 1) (1)
3.6.4 **TWO economic implications of the parasite**
- Loss in production/income/yield ✓
- Quality of products will be damaged/reduced ✓
- Financial implications/increased cost ✓
- Cost of labour/time consuming ✓

(Any 2) (2) [35]

**QUESTION 4: ANIMAL REPRODUCTION**

4.1 **A reproductive process occurring in cows**

4.1.1 **Identification of the process above**
Milking/lactation ✓

(1)

4.1.2 **THREE visible stimuli from the picture**
- The milking equipment ✓
- The calf ✓
- Touching of the udder/milker ✓

(3)

4.1.3 **Hormone responsible for the contractions of the glandular cavity during the process**
Oxytocin ✓

(1)

4.1.4 **The reproductive stage that lasts for 282 days in cattle**
Pregnancy/gestation ✓

(1)

4.2 **Stages of the oestrus cycle**

4.2.1 **Labels of the phases of oestrus cycle**
A - Oestrus ✓
B - Di oestrus ✓
C - Met oestrus ✓
D - Pro oestrus ✓

(1)

(1)

(1)

(1)

4.2.2 **Indication of the letters representing the stage of oestrus**
(a) A ✓
(b) C ✓

(1)

(1)

4.3 **Process generally used in the reproduction of farm animals**

4.3.1 **The process illustrated in the diagram**
Nuclear transfer/cloning ✓

(1)

4.3.2 **Identification of the cells**
A - Recipient cell with nucleus/egg cell/ovum ✓
B - The nucleus of the donor cell ✓
D - The fused cell ✓

(1)

(1)

(1)

4.3.3 **TWO different types of the process**
- Reproductive cloning ✓
- Therapeutic cloning ✓

(2)
4.4 Apparatus used in the Artificial Insemination (AI) process

4.4.1 Identification of the apparatus
A - Artificial vagina ✓ (1)
B - Pistolette ✓ (1)
C - Nitrogen flask/canister/tank ✓ (1)

4.4.2 Function of each apparatus
A - Collection of semen ✓ (1)
B - For the deposition of semen in the cow during AI ✓ (1)
C - Storage of semen for longer periods ✓ (1)

4.4.3 TWO basic requirements for the collection of semen from bulls
• Should be close to a laboratory ✓
• Equipment must be clean/sterilised ✓
• Availability of appropriate equipment/artificial vagina ✓
• Male animal must be clean/healthy ✓
• Warm collecting vial/placed in a water bath/prevent temperature shock ✓
• Personnel must be trained/experienced ✓
• Floor not slippery ✓
• Semen must be protected from direct sunlight ✓
• Teaser cows availability ✓ (Any 2) (2)

4.5 Synchronisation schedule of female animals

4.5.1 Identification of the process
Synchronisation of oestrus ✓ (1)

4.5.2 TWO disadvantages of a synchronisation schedule in cattle
• Poor nutrition/body condition/health will affect the process negatively ✓
• Needs good/expensive facilities ✓
• Labour/time intensive ✓
• Involves skilled management and technologies ✓ (Any 2) (2)

4.5.3 TWO techniques used in the synchronisation of female animals
• Synthetic progesterone/progestin/oestradiol ✓
• Co-Synch/gonadotropin/co-synch synchronisation ✓
• Ear patches/implants ✓
• Vaginal insurgents ✓ (Any 2) (2)

4.5.4 Indication of the time (day) when the cows will be inseminated
Day 35 – 40 ✓ (1)
4.6 THREE causes for lack of libido

- Immaturity ✓
- Inexperience ✓
- Diseases ✓
- Underfeeding/overfeeding/malnutrition ✓
- Old age/senility ✓
- Overwork/exhaustion/over exertion ✓
- Improper handling/stress ✓
- Lack of testosterone ✓
- Temperament ✓
- Environment ✓

(Any 3) (3)

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TOTAL SECTION B: 105

GRAND TOTAL: 150