MARKS: 150

This memorandum consists of 9 pages.
SECTION A

QUESTION 1

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

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

1.3 1.3.1 Polyneuritis ✓ ✓
     1.3.2 Intermediary/intermediate host ✓ ✓
     1.3.3 Anterior ✓ ✓
     1.3.4 Enucleating ✓ ✓
     1.3.5 Pedometer ✓ ✓ (5 x 2) (10)

1.4 1.4.1 Feed Conversion Ratio ✓
     1.4.2 Infectious/contagious ✓
     1.4.3 Donor/superior ✓
     1.4.4 Dry ✓
     1.4.5 Prolapsed vagina/prolapse ✓ (5 x 1) (5)

TOTAL SECTION A: 45
SECTION B

QUESTION 2: ANIMAL NUTRITION

2.1 Alimentary canal of farm animals

2.1.1 Identification of a non-ruminant animal
- Animal 2 ✓ (1)

2.1.2 Reason
It does not have a complex stomach/has simple stomach ✓ (1)

2.1.3 Type of feed in ration of animal 1
Roughage ✓ (1)

2.1.4 ONE reason for the feeding a roughage
- Has a higher crude fibre/cellulose content needed for the activity of rumen micro flora ✓ (1)

2.1.5 Letter representing a part enabling the digestion of roughage
- A ✓ (1)

2.1.6 Explanation of the role of parts D and E in digestion
- Part D – Contains enzymes for digestion of grain feed ✓ (1)
- Part E – Helps to soften and moistens grain feed ✓ (1)

2.2 Energy flow in an animal

2.2.1 Completion of representation
- A – Metabolic energy ✓ (1)
- B – Faeces ✓ (1)
- C – Body Heat ✓ (1)

2.2.2 Energy as final combustion heat released during oxidation
GE/Gross energy ✓ (1)

2.2.3 Formula to work out digestible energy
DE = gross energy – energy lost in faeces ✓ (1)

2.2.4 TWO reasons for the importance of net energy
- Needed for production ✓
- Needed for maintenance ✓ (2)
2.3 Biological values of feeds

2.3.1 Feeds and reasons

(a) Fishmeal ✓

**Reason**
It has the highest BV(90)/essential amino acids needed for growth ✓

(b) Maize ✓

**Reason**
It is has the highest energy value/energy value of 80 that is needed for fattening ✓

(c) Barley ✓

**Reason**
They need feed with a low BV/BV of 50/energy value of 60% necessary for maintenance ✓

2.3.2 Reason for high BV in lucerne over barley
- Lucerne is a legume crop that is rich in proteins ✓
- Barley is a non-legume which is poor in proteins/rich in carbohydrates ✓

2.4 Fodder flow programme

2.4.1 Total feed needed for the year:
**Need for the dry season**
Need per animal/day x number of animals x 30 days x 6 months

- 15 kg x 30 animals x 30 days x 6 months ✓
- 81 000 kg ✓

**Need for the whole year** = Rainy season need + Dry season need
- 108 000 kg + 81 000 kg = 189 000 kg ✓

2.4.2 Total amount available for the dry season
- 0,15 x 1000 x 42 x 6 ✓
- 37 800 kg ✓

2.4.3 Feed flow problem for the farmer during the dry season
Need of feed exceeds the available resources/shortage as 37 800 kg ✓ available compared to 81 000 kg need for the animals ✓

2.4.4 Sustainable measure to correct the shortage
- Cutting fodder during rainy season ✓
- Storage of fodder for dry season ✓
- Culling/stock reduction ✓ (Any 1)

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2.5 Balanced ration

2.5.1 Amounts of maize and sunflower oilcake in 600kg

- Maize = \(61.29 \times 600 \text{ kg} \)
  \[
  \frac{61.29 \times 600}{100} = 367.74 \text{ kg}
  \]

- Sunflower oilcake = \(38.71 \times 600 \text{ kg} \)
  \[
  \frac{38.71 \times 600}{100} = 232.26 \text{ kg}
  \]

2.5.2 Feed constituting 19 parts
Maize meal

QUESTION 3: ANIMAL PRODUCTION, PROTECTION AND CONTROL

3.1 Floor space required by pigs

3.1.1 Bar graph

Criteria/rubric/marking guidelines

- Correct heading
- X-axis – correct calibrations and labelled (Live mass)
- Y-axis – correct calibrations and labelled (Floor space required)
- Both units are correct unit (m²/kg)
- Bar graph
- Accuracy

3.1.2 Trend between floor space required and live mass

- The increase in live mass leads to
- Increase in floor space required

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3.2 Apparatus used for procedures in animal production system

3.2.1 Identification of the apparatus
Illustrator/rubber ring ✓ (1)

3.2.2 TWO management practices for the use of the apparatus
- Tail docking ✓
- Castration ✓ (2)

3.2.3 ONE reason for the importance of each practice
Tail docking
- Hygienic purposes/prevention of blowfly attacks ✓
- Better reproduction ✓ (Any 1)

Castration
- For better breeding purposes
- All the inferior male animals are castrated ✓ (2)

3.3 Loading and transportation of farm animals

3.3.1 Facility to direct animal
Crush ✓ (1)

3.3.2 TWO measures to design a crush
- Should have high/strong/solid sides in order to prevent animals from seeing out ✓
- Should have single/narrow curves that are not sharp ✓
- Nothing that can harm/hurt/cause injury to animals should be included ✓ (Any 2) (2)

3.3.3 Document needed to transport animals
Permit ✓ (1)

3.3.4 TWO precautionary measures to reduce stress in animals
- Keep animals to be transported together for 2 or 3 days ✓
- Group animals of the same size/sex/age together ✓ (2)

3.4 Life cycle of a blowfly

3.4.1 Name of the parasite
Blowfly ✓ (1)

3.4.2 Harmful stage in the life cycle
Larval stage ✓ (1)

3.4.3 Condition caused by larval stage
Blowfly strike/attacks ✓ (1)

3.4.4 Term used for removal of wool
Crutching ✓ (1)
3.4.5 **THREE non-chemical management practices to control parasite infestation**

- Correct timing of shearing and crutching ✓
- Clipping and cleaning of wool ✓
- Tail docking ✓
- Lambing time after shearing ✓
- Breeding and selection of resistant breeds ✓

(Any 3) (3)

3.5 **Plant poisoning**

3.5.1 Feed them before transporting ✓ (1)

3.5.2 Inspection of hay for fusarium/fungi ✓ (1)

3.5.3 Practise rotational grazing ✓ (1)

3.6 **Animal diseases**

3.6.1 **Type of pathogen**

Virus ✓ (1)

3.6.2 **Common characteristic**

- Both are contagious/deadly ✓
- Both are enzootic ✓ (Any 1) (1)

3.6.3 **TWO roles of state in controlling the spread of diseases**

- Public awareness/notify public ✓
- Import/export bans ✓
- Supplying veterinary services ✓
- Setting of quarantine zones ✓ (Any 2) (2)

3.6.4 **TWO economic implications of diseases**

- Export bans affect economy ✓
- Job loss ✓
- Financial implications/millions of rands lost ✓
- Cost/time/labour of medication ✓
- Suspension of production ✓ (Any 2) (2)

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QUESTION 4: ANIMAL REPRODUCTION

4.1 Graph showing volume and concentration of semen in animals

4.1.1 Concentration of semen at volume of 6ml
   - 1 billion/ml

4.1.2 Correlation
   Dairy cattle
   - Dairy bulls produce a lot of semen that is less concentrated
   Sheep
   - Sheep produce less semen that is highly concentrated

4.2 Semen colour and quality

4.2.1 Reason for the colour of semen
   (a) Presence of fresh blood
   (b) Presence of old blood/infection

4.2.2 TWO negative effects on quality of semen
   - Poor nutrition
   - Severe environmental conditions/temperature
   - Age
   - Diseases
   (Any 2)

4.3 Techniques to increase number of offspring

4.3.1 (a) Cloning
   (b) Embryo Transplantation
   (c) Artificial insemination
   (d) Cloning

4.3.2 Correct stage of insemination
   Oestrus

4.3.3 Relationship between ovulation and insemination timing
   - AI should be performed approximately 6–14 hours before ovulation
   - That gives time for semen to move to the fallopian tube
   - So that the ovum does not wait too long before fertilisation

4.4 Multiple births

4.4.1 Types of twins in representation A and B
   - A Dizygotic twin
   - B Monozygotic twin

4.4.2 Justification
   - A – two eggs fertilised to produce two different offspring
   - B – one egg cell fertilised to produce two similar offspring
4.4.3 **Process in representation B**
Cleavage of the same zygote ✓

(1)

4.4.4 **Reason for the gender of the twins in representation A**
Fertilisation of two separate ova ✓

(1)

4.4.5 **THREE factors for multiple births**
- Fertility/genetics ✓
- Environmental factors ✓
- Breed type ✓
- Nutrition ✓

(Any 3) (3)

4.5 **Foetal position**

4.5.1 **Identification of parturition stage**
Preparatory ✓

(1)

4.5.2 **Appropriate scientific name for calving difficulty**
Dystocia ✓

(1)

4.5.3 **TWO actions to save a calf and the cow**
- Correcting the position before calving ✓
- Veterinary section if position cannot be corrected ✓

(2)

4.6 **Milk ejection**

4.6.1 **TWO stimuli by the milker**
- Washing of udder ✓
- Massage of the udder ✓
- Appearance and sound of the milker ✓
- Milking action ✓

(Any 2) (2)

4.6.2 **Hormone for milk ejection**
Oxytocin ✓

(1)

4.6.3 **Hormone inhibiting milk ejection**
Adrenalin ✓

(1)

4.6.4 **Bacterial disease affecting the udder**
Mastitis ✓

(1)

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TOTAL SECTION B: 105
GRAND TOTAL: 150