



education

Department:
Education
North West Provincial Government
REPUBLIC OF SOUTH AFRICA

PROVINCIAL ASSESSMENT

GRADE 12

AGRICULTURAL SCIENCES P1

JUNE 2025

MARKING GUIDELINES

MARKS: 150

These marking guidelines consist of 10 pages.

SECTION A**QUESTION 1**

- | | | | | |
|-----|--------|--------------------------------|----------|------|
| 1.1 | 1.1.1 | B ✓✓ | | |
| | 1.1.2 | A ✓✓ | | |
| | 1.1.3 | B ✓✓ | | |
| | 1.1.4 | A ✓✓ | | |
| | 1.1.5 | C ✓✓ | | |
| | 1.1.6 | D ✓✓ | | |
| | 1.1.7 | D ✓✓ | | |
| | 1.1.8 | A ✓✓ | | |
| | 1.1.9 | C ✓✓ | | |
| | 1.1.10 | D ✓✓ | (10 x 2) | (20) |
| 1.2 | 1.2.1 | B only ✓✓ | | |
| | 1.2.2 | A only ✓✓ | | |
| | 1.2.3 | None ✓✓ | | |
| | 1.2.4 | Both A and B ✓✓ | | |
| | 1.2.5 | A only ✓✓ | (5 x 2) | (10) |
| 1.3 | 1.3.1 | Lipase ✓✓ | | |
| | 1.3.2 | Homeothermic ✓✓ | | |
| | 1.3.3 | Impotence ✓✓ | | |
| | 1.3.4 | Superovulation ✓✓ | | |
| | 1.3.5 | Pistolette/insemination gun ✓✓ | (5 x 2) | (10) |
| 1.4 | 1.4.1 | Papillae ✓ | | |
| | 1.4.2 | Flight zone ✓ | | |
| | 1.4.3 | Embryo flushing/harvesting ✓ | | |
| | 1.4.4 | Spermatogenesis ✓ | | |
| | 1.4.5 | Freemartin ✓ | (5 x 1) | (5) |

TOTAL SECTION A: 45

SECTION B**QUESTION 2: ANIMAL NUTRITION****2.1 The alimentary canal of a farm animal****2.1.1 Classification of the farm animal**

Ruminant ✓ (1)

2.1.2 Identification of the farm animal

Cattle/sheep/goat ✓ (1)

2.1.3 Reason

It has a complex/compound/polygastric stomach ✓ (1)

2.1.4 Identification of the parts

B – Reticulum ✓

D – Abomasum ✓

G – Caecum ✓ (3)

2.1.5 TWO adaptations of the rumen to digest feed rich in fibre

- Presence of micro-organisms/rumen micro-flora ✓
- Presence of papillae ✓
- Contractions mix the food and bring it onto contact with micro-organisms ✓
- Anaerobic environment ✓
- pH control ✓
- It has a large fermentation vessel ✓ (Any 2) (2)

2.2 Components of feed**2.2.1 Identification of components**

A – Water/moisture ✓

B – Dry matter/DM ✓

C – Organic matter ✓ (3)

2.2.2 TWO roles of water/moisture in digestion

- An important solvent ✓
- Helps during mechanical digestion/moistens food ✓
- Prevents constipation ✓
- Transportation of nutrients ✓
- Eliminates waste products ✓
- Part of biochemical reactions/homeostasis ✓
- Acts as lubricant ✓
- Regulates body temperature/cooling system ✓
- Supplies turgor pressure in cells/provides tensile strength/shape to cells ✓
- Major component of cells/blood/body tissue ✓
- Protects sensitive tissues in the body/shock absorbing fluid ✓
- For efficient milk production ✓ (Any 2) (2)

2.2.3 Identification of the component

- (a) Zinc/Zn ✓ (1)
 (b) Phosphorus/P ✓ (1)
 (c) Iodine/I ✓ (1)

2.3 Digestibility co-efficient**2.3.1 Calculation of the digestibility co-efficiency**

$$\begin{aligned} \text{DC} &= \frac{\text{Dry matter intake (kg)} - \text{dry matter excreted (kg)}}{\text{Dry matter intake (kg)}} \times \frac{100}{1} \checkmark \\ &= \frac{10 \text{ kg} - 2,5 \text{ kg}}{10 \text{ kg}} \times \frac{100}{1} \checkmark \\ &= 76,19 \checkmark \% \checkmark \end{aligned} \quad (4)$$

2.3.2 Implication of the calculated value

- The feed was highly ✓ digested and absorbed ✓
 - 76,19% ✓ of the feed was digested and absorbed ✓
 - 23,81% ✓ was excreted ✓
- (Any 2) (2)

2.4 Nutritive ratio**2.4.1 Calculation of the Nutritive Ratio**

$$\begin{aligned} \text{TDN} &= 20\% + 34\% + 17\% = 71\% \checkmark \\ \text{NR} &= 1 : \frac{\% \text{TDN} - \% \text{DP}}{\% \text{DP}} \checkmark \\ &= 1 : \frac{71\% - 34\%}{34\%} \checkmark \\ &= 1 : 1 \checkmark \end{aligned}$$

OR

$$\begin{aligned} \text{DNNS} &= 71\% - 34\% = 37\% \checkmark \\ \text{NR} &= 1 : \frac{\% \text{DNNS}}{\% \text{DP}} \checkmark \\ &= 1 : \frac{37\%}{34\%} \checkmark \\ &= 1 : 1 \checkmark \end{aligned} \quad (4)$$

2.4.2 Justification of the suitability of FEED B for growth

Suitable ✓ because it has a narrow nutritive ratio/more proteins/less carbohydrates ✓ (2)

2.5 Fodder flow programme**2.5.1 Definition of fodder flow**

- A strategic plan ✓
 - To ensure enough fodder ✓
 - To meet the requirements of all the animals ✓
 - Throughout the year ✓
 - In terms of quality and quantity ✓
- (Any 2) (2)

2.5.2 TWO months when feed was sufficient

- January ✓
- February ✓
- March ✓

(Any 2) (2)

2.5.3 Calculation of the shortage of feed during the month of May $= 110 \text{ tons} - 60 \text{ tons} = 50 \text{ tons} \checkmark$ $= 50 \text{ tons} \times 1000 \text{ kg} \checkmark$ $= 50\,000 \text{ kg} \checkmark$

(3)

[35]**QUESTION 3: ANIMAL PRODUCTION, PROTECTION AND CONTROL****3.1 Production and farming systems****3.1.1 Identification of farming and production systems**

- (a) **Production system** – Intensive ✓
- (b) **Farming system** – Commercial ✓

(1)

(1)

3.1.2 Justification for intensive production system

There are many animals in small area ✓

(1)

3.1.3 Comparison between intensive and extensive production**(a) Carcass quality**

Intensive: High carcass quality ✓

Extensive: Low carcass quality ✓

(2)

(b) Energy used

Intensive: Less energy used ✓

Extensive: More energy used ✓

(2)

(c) Exposure to diseases

Intensive: Less exposed to diseases ✓

Extensive: More exposed to diseases ✓

(2)

3.2 Ways in which animals lose heat

3.2.1 E ✓

(1)

3.2.2 C ✓

(1)

3.2.3 D ✓

(1)

3.2.4 A ✓

(1)

3.2.5 B ✓

(1)

3.3 Animal handling

3.3.1 Identification of the tool

PICTURE A – Burdizzo ✓

PICTURE B – Drenching gun ✓

(2)

3.3.2 TWO reasons for handling cattle

- Transportation ✓
- General examination ✓
- Pregnancy diagnosis ✓
- Weighing ✓
- Control external parasites/dipping/foot bathing ✓
- Age determination ✓
- Dehorning ✓
- Vaccination ✓
- Dosing ✓
- Milking ✓
- Rotational grazing ✓
- Help with calving ✓
- Marking ✓
- Marketing ✓
- Training for show competitions ✓
- Hoof trimming ✓
- Artificial insemination ✓
- Production purposes ✓
- Slaughtering ✓
- Selection ✓
- Weaning ✓
- Feeding ✓
- Docking ✓
- Evaluation and classification ✓
- Generation of data ✓

(Any 2)

(2)

3.4 Different symptoms of diseases that affect farm animals

3.4.1 Classification of diseases

ANIMAL 1 – Viral ✓

ANIMAL 2 – Protozoan ✓

(2)

3.4.2 Name of the disease

Heartwater ✓

(1)

3.4.3 Indication of the animal with zoonotic disease

Animal 1 ✓

(1)

3.4.4 TWO roles of state in controlling the spread of diseases

- Public awareness/notify public ✓
- Conduct research ✓
- Import/export bans ✓
- Supplying veterinary services ✓
- Generate and implement legislation ✓
- Control movement of animals/transport permits ✓
- Setting of quarantine zones ✓

(Any 2) (2)

3.5 External parasites**3.5.1 Identification of the type of parasite**

Ecto/external parasites ✓

(1)

3.5.2 Life cycle of the parasite

Two-host ✓

(1)

3.5.3 Rearrange the stages of the life cycle of a parasite

E ✓

A ✓

D ✓

B ✓

C ✓

(5)

3.5.4 TWO economic implications of the parasite to farmers

- Production losses ✓
- Death of animals ✓
- Skin/hides/teats/udders/ears are damaged ✓
- Financial/cost/time/labour implications of treatment ✓
- Loss of profit ✓

(Any 2) (2)

3.6 TWO plants that are poisonous to farm animals

- Thorn apple/devil's apple ✓
- Poison bulb/slangkop ✓
- Poison ivy ✓
- Maize fungus ✓
- Lantana camara ✓
- Tulip ✓
- Seneciosis ✓
- Gousiektebossie ✓
- Diplodiosis ✓
- Poison leaf/gifblaar ✓
- Geeldikkop ✓
- Gousiekte ✓
- Vermeersiekte ✓

(Any 2) (2)

[35]

QUESTION 4: ANIMAL REPRODUCTION**4.1 Male and female reproductive organs****4.1.1 Term that describes parts A, E and F**

Accessory glands ✓ (1)

4.1.2 Identify the following(a) **Part D – Scrotum** ✓ (1)(b) **Part G – Urethra** ✓ (1)(c) **The process taking place in DIAGRAM B – Ovulation** ✓ (1)(d) **Part J – Ovary** ✓ (1)**4.1.3 TWO congenital defects of the testes**

- Cryptorchidism ✓
- Hermaphroditism ✓
- Hypoplasia ✓
- Sperm defects ✓ (Any 2) (2)

4.1.4 The part performing the same function as the ovary

C ✓ (1)

4.2 Nuclear transfer/cloning**4.2.1 Identification of the reproductive technique**

Nuclear transfer/cloning ✓ (1)

4.2.2 TWO different types of cloning

- Reproductive cloning ✓
- Therapeutic cloning ✓ (2)

4.2.3 ONE disadvantage of cloning

- It is expensive ✓
- Requires specific skills/expert knowledge ✓
- Cloned animals age prematurely/limited capacity to survive ✓
- There is an increased incidence of abnormalities ✓
- Dystocia problems due to large offspring ✓
- Cloned animals do not have good immune systems ✓
- Clones can produce oversized offspring with enlarged hearts, immature lungs and damaged kidneys
- There are ethical concerns about cloning animals and also consuming products from cloned animals
- There are concerns about animal welfare with respect to adverse effects
- Genetic diversity deteriorates ✓ (Any 1) (1)

4.3 Artificial insemination

4.3.1 Identification of the reproductive technique

Artificial insemination/AI ✓ (1)

4.3.2 TWO characteristics of good quality semen

- Opaque/milky in colour ✓
- Sticky ✓
- Less than 15% dead sperm cells ✓
- No deformed sperm cells/deformities ✓
- No blood in semen ✓
- Healthy sperm cells ✓
- Viable sperm cells ✓
- High concentration of sperm cells ✓ (Any 2) (2)

4.3.3 TWO requirements for semen collection

- All equipment that will be used should be readily available ✓
- Equipment must be hygienic/clean/sterilized ✓
- Floor area must not be slippery ✓
- Personnel must be trained/skilled with experience/expertise ✓
- Vial must be kept warm before and after collection ✓
- Enough handlers should be available ✓
- Teaser cow should be available ✓
- Semen must not be exposed to direct sunlight ✓ (Any 2) (2)

4.4 Fertilisation

4.4.1 Identification of the reproductive process

Fertilisation ✓ (1)

4.4.2 Identification of parts B and C

B – Ovum/Egg cell/Female reproductive cell/Female gamete ✓
C – Zygote/Blastocyst/Zona pellucida ✓ (2)

4.4.3 The section of sperm cell that is responsible for the following

- (a) **Motility** – Tail/Flagellum ✓ (1)
- (b) **Carrier of genetic information** – Head/Nucleus ✓ (1)

4.5 Stages of pregnancy

4.5.1 Identification of stages

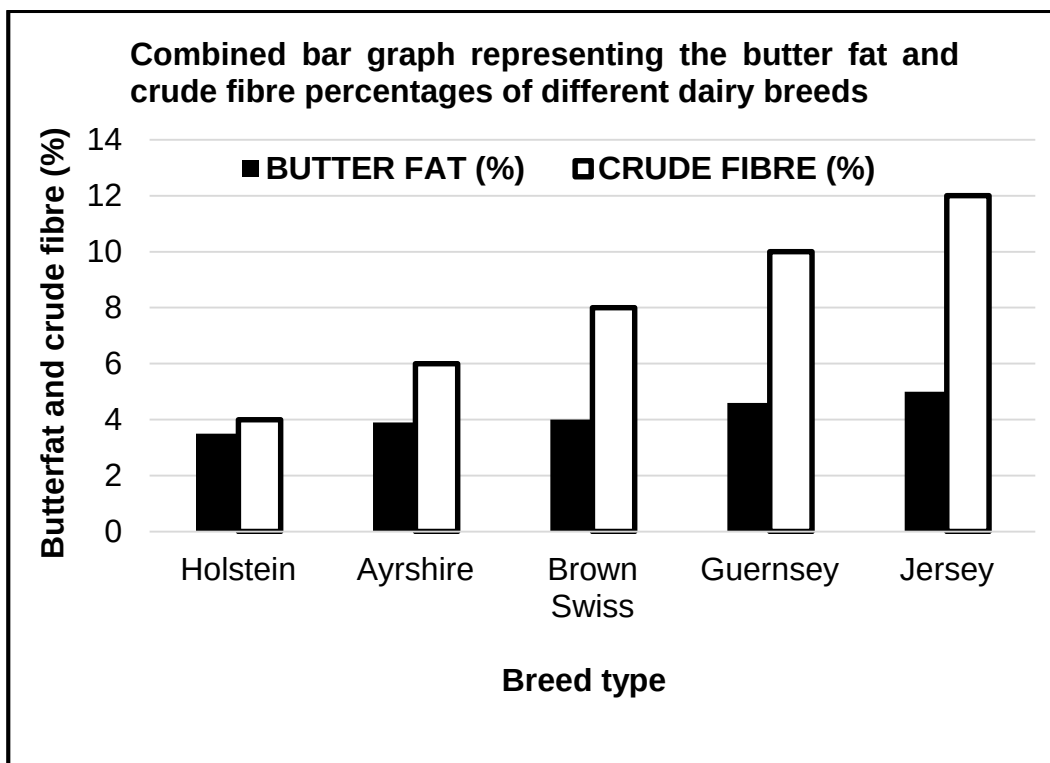
Diagram A – Ovum/stage of ovum ✓
Diagram B – Foetal stage ✓ (2)

4.5.2 Deduction of the stage of pregnancy

Embryo/embryonic stage/stage of embryo ✓ (1)

4.5.3 Conditions that could occur

- | | | |
|-----|-----------------|-----|
| (a) | Maceration ✓ | (1) |
| (b) | Mummification ✓ | (1) |
| (c) | Abortion ✓ | (1) |

4.6 Bar graph**4.6.1 Combined bar graph representing the butter fat and crude fibre percentages of different dairy breeds****CRITERIA/RUBRIC/MARKING GUIDELINES**

- Correct heading ✓
 - X-axis: correct calibrations and labelled (Breed type) ✓
 - Y-axis: correct calibrations and labelled (Butterfat and crude fibre) ✓
 - Correct units (%) ✓
 - Bar graph ✓
 - Accuracy (80%+ correctly plotted) ✓
- (6)

4.6.2 Identification of the dairy breed that produces milk with the highest crude fibre percentage

Jersey ✓

(1)
[35]

TOTAL SECTION B: 105
GRAND TOTAL: 150