



Province of the
EASTERN CAPE
EDUCATION

Iphondo leMpuma Kapa: Isebe leMfundo
Provinsie van die Oos Kaap: Departement van Onderwys
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NATIONAL SENIOR CERTIFICATE

GRADE 12

JUNE 2026

AGRICULTURAL SCIENCES MARKING GUIDELINE

MARKS: 150

These marking guidelines consist of 10 pages.

SECTION A**QUESTION 1**

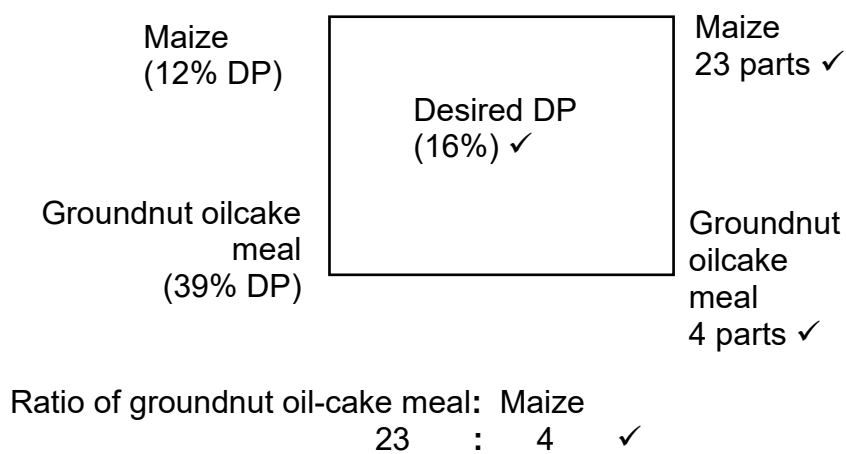
- 1.1 1.1.1 A ✓✓
- 1.1.2 D ✓✓
- 1.1.3 B ✓✓
- 1.1.4 C ✓✓
- 1.1.5 C ✓✓
- 1.1.6 A ✓✓
- 1.1.7 C ✓✓
- 1.1.8 C ✓✓
- 1.1.9 B ✓✓
- 1.1.10 A ✓✓ (10 x 2) (20)
- 1.2 1.2.1 Both A and B ✓✓
- 1.2.2 B only ✓✓
- 1.2.3 B only ✓✓
- 1.2.4 None ✓✓
- 1.2.5 Both A and B ✓✓ (5 x 2) (10)
- 1.3 1.3.1 Regurgitation ✓✓
- 1.3.2 Anthrax ✓✓
- 1.3.3 Freemartin ✓✓
- 1.3.4 Nuclear transfer ✓✓
- 1.3.5 Fertilisation ✓✓ (5 x 2) (10)

1.4	1.4.1	Assimilation ✓		
	1.4.2	Subsistence ✓		
	1.4.3	Chinball marker ✓		
	1.4.4	Ejaculation ✓		
	1.4.5	Oxytocin ✓	(5 x 1)	(5)
TOTAL SECTION A:				45

SECTION B

QUESTION 2: ANIMAL NUTRITION

- 2.1 2.1.1 **Animal with alimentary canal shown in the diagram**
Fowl ✓ (1)
- 2.1.2 **Identification of parts I and E**
I – Proventriculus ✓
E – Caeca ✓ (2)
- 2.1.3 **Identification of parts**
(a) B ✓ (1)
(b) E ✓ (1)
- 2.1.4 **Adaptations of part J that allows it to perform its function**
 - Thick, muscular walls ✓
 - Tough inner lining ✓
 - Ingested grit/small stones ✓
(Any 2) (2)
- 2.2 2.2.1 **Most expensive feed**
Feed A ✓ (1)
- 2.2.2 **Representation of figure 1 in FEED B**
Protein content ✓ (1)
- 2.2.3 **Feed ideal for a lactating cow**
Feed A ✓ (1)
- 2.2.4 **Motivation of answer to QUESTION 2.2.3**
The feed has a narrow nutritive ratio/rich in protein ✓ required for milk production ✓ (2)
- 2.3 **Use of Pearson square method to determine feed mixing ratio**



- 2.4 **A** – Goitre ✓
 B – Vitamin B1 ✓
 C – Parakeratosis ✓
 D – Vitamin E ✓ (4)
- 2.5 2.5.1 **Potential energy of the feed**
 350 kj ✓ (1)
- 2.5.2 **Energy loss A**
 Energy lost as fermentation gases ✓ (1)
- 2.5.3 **Calculation of digestible energy**
 Digestible energy = Gross energy – Energy lost as faeces ✓
 = 350 kj – 80 kj ✓
 = 270 kj ✓ (3)
- 2.5.4 **Uses of feed energy value calculations**
 • To determine feeding standards ✓
 • To determine animal's diet ✓
 • To determine ration formulation ✓ (Any 2) (2)
- 2.6 2.6.1 **Digestibility coefficient calculation**
- Dry matter intake = 89% of 18 kg
 = $\frac{89}{100} \times 18 \text{ kg}$
 = 16,02 kg ✓
- Dry matter excreted = 100% - 60% of 6 kg
 = 40% of 6 kg
 = $\frac{40}{100} \times 6 \text{ kg}$
 = 2,4 kg ✓
- Digestibility co-efficient = $\frac{\text{Dry matter intake} - \text{Dry matter excreted}}{\text{Dry matter intake}} \times 100$ ✓
 = $\frac{16.02 \text{ kg} - 2.4 \text{ kg}}{16.02 \text{ kg}} \times 100$ ✓
 = 85% ✓ (6)
- 2.6.2 **Implication of digestibility coefficient**
 85% of the feed was digested ✓ and the remainder was excreted ✓ (2)

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QUESTION 3: ANIMAL PRODUCTION, PROTECTION AND CONTROL

- 3.1 3.1.1 **Identification of housing system**
Dairy parlour ✓ (1)
- 3.1.2 **Production system that utilises dairy parlour**
Intensive production ✓ since animals are given feed ✓ (2)
- 3.1.3 **Guidelines for handling cattle in the facility above**
- Avoid blind spots / Don't stand directly in front of or behind cattle, as they have blind spots. ✓
 - Avoid hitting animals / use sticks with flaps to make noise, striking the ground is better than hitting the animal. ✓
 - Avoid yelling, whistling and fast movements as they can scare cattle, making them unpredictable and increasing stress. ✓
 - Know their point of balance: to move a cow forward, work behind its shoulder; to move it back, work in front of the shoulder. ✓
 - Respect their space (flight zone), enter their personal space (flight zone) gently from the shoulder to encourage movement and step out to stop them. ✓
 - Use proper facilities / Work in clean, well-maintained yards with non-slip surfaces, solid-sided tubs, and proper crushes/chutes. ✓
 - Always have an escape route and never get trapped behind cattle or gates. ✓
 - Never work alone with large or dangerous cattle like bulls. ✓
- (Any 2 x 1) (2)
- 3.1.4 **Factors optimising production visible on the diagram**
- Nutrition ✓
 - Environment ✓
 - General Enterprise management ✓
- (Any 2) (2)
- 3.2 3.2.1 **Identification of heat loss mechanism**
- (a) Radiation ✓ (1)
- (b) Conduction ✓ (1)
- 3.2.2 **Ways of keeping pigs cool under intensive farming**
- Provide constant cool water ✓
 - Ensure ample shade ✓
 - Use misters/sprinklers for evaporative cooling ✓
 - Create mud wallows ✓
 - Boost ventilation with fans ✓
- (Any 2 x 1) (2)
- 3.2.3 **Effect of excessive heat loss on animal production**
- Animals will use energy from the feed to keep themselves warm ✓ resulting in low production. ✓ (2)

- 3.3 3.3.1 **Reasons for handling animals**
- Marketing ✓
 - Weighing ✓
 - Medical examination ✓
 - Administration of medication ✓
 - Routine production activities such as dehorning, hoof trimming ✓
- (Any 2 x 1) (2)
- 3.3.2 **Consequences of improper handling of animals**
- Injuries to handler ✓
 - Poor meat quality ✓
 - Animals will fight ✓
- (Any 2 x 1) (2)
- 3.4 3.4.1 **Identification of signs of a sick animal**
- Dull, rough coat ✓
 - Dull, glassy eyes ✓
 - Visible ribs/ spine/ hip bones ✓
 - Dirty hocks and tail area ✓
- (Any 2 x 1) (2)
- 3.4.2 **Methods of testing animal health**
- Checking temperature ✓
 - Heart rate ✓
 - Respiratory rate ✓
 - Palpation ✓
 - Blood tests ✓
- (Any 2 x 1) (2)
- 3.5 3.5.1 **Word that describes avian influenza as easily spreading from one organism to another**
- Contagious ✓ (1)
- 3.5.2 **TWO symptoms of avian flu**
- Sudden death of whole poultry flock ✓
 - Fever ✓
 - Multiple organ failure ✓
- (Any 2 x 1) (2)
- 3.5.3 **Examples of other viral diseases**
- Rabies ✓
 - Rift Valley fever ✓
 - Swine flu ✓
 - Newcastle disease ✓
 - Foot and mouth disease ✓
- (Any 3 x 1) (3)
- 3.5.4 **Identification of TWO economic impacts of diseases mentioned in the passage**
- Stock losses ✓
 - Loss of production ✓
- (2)

- 3.6 3.6.1 **TWO symptoms of urea poisoning**
- Bloating ✓
 - Tetany ✓
 - Nervous symptoms/convulsions/staggering ✓
 - Breathing difficulty ✓
- (Any 2 x 1) (2)
- 3.6.2 **Urea poisoning preventative measures**
- Ensure animals have sufficient salt free water ✓
 - Cover urea licks against the rain ✓
 - Accustom animals to urea and salt licks ✓
- (2)
- 3.6.3 **TWO roles of the state in animal protection**
- Introduction of legislation ✓
 - Provision of veterinary services ✓
 - Provision of quarantine services ✓
 - Control of imports and exports ✓
 - Provision of research services ✓
- (2)
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QUESTION 4: ANIMAL REPRODUCTION

- 4.1 4.1.1 **Labelling of organs**
- (a) Cervix (1)
 - (b) Ovary (1)
 - (c) Vagina (1)
- 4.1.2 **Functions of the cervix**
- Acts as sperm reservoir ✓
 - It dilates, relaxes, and opens to allow for the passage of the foetus during parturition ✓
 - During pregnancy, a thick mucus forms a 'cervical plug' to seal the cervix, protecting the foetus from infections.
- (Any 2 x 1) (2)
- 4.1.3 **TWO ways reproduction will be affected if organ G was damaged**
- There will be no hormone production ✓
 - There will be no ovum ✓
- (2)
- 4.2 4.2.1 **Identification of ONE advantage of embryo transfer**
- Rapidly multiply superior genetics ✓ (1)
- 4.2.2 **Definition of *synchronisation* of oestrus**
- The process of manipulating the oestrus cycle to induce standing oestrus ✓ in the majority of animals within a short time ✓ (2)

4.2.3 **The first TWO stages of embryo transfer**

- Synchronisation of donor and recipients ✓
- Superovulation ✓

(2)

4.2.4 **Disadvantages of embryo transfer**

- It is expensive ✓
- Time consuming ✓
- Results in reduced genetic variation ✓
- Technical Expertise is required ✓

(Any 2 x 1)

(2)

4.3 4.3.1 **Identification of the process in the diagram**

Spermatogenesis ✓

(1)

4.3.2 **Identification of stages B and E**

B – Primary spermatocyte ✓

E – Spermatid ✓

(2)

4.3.3 **Hormone that stimulates the process in the diagram**

Testosterone ✓

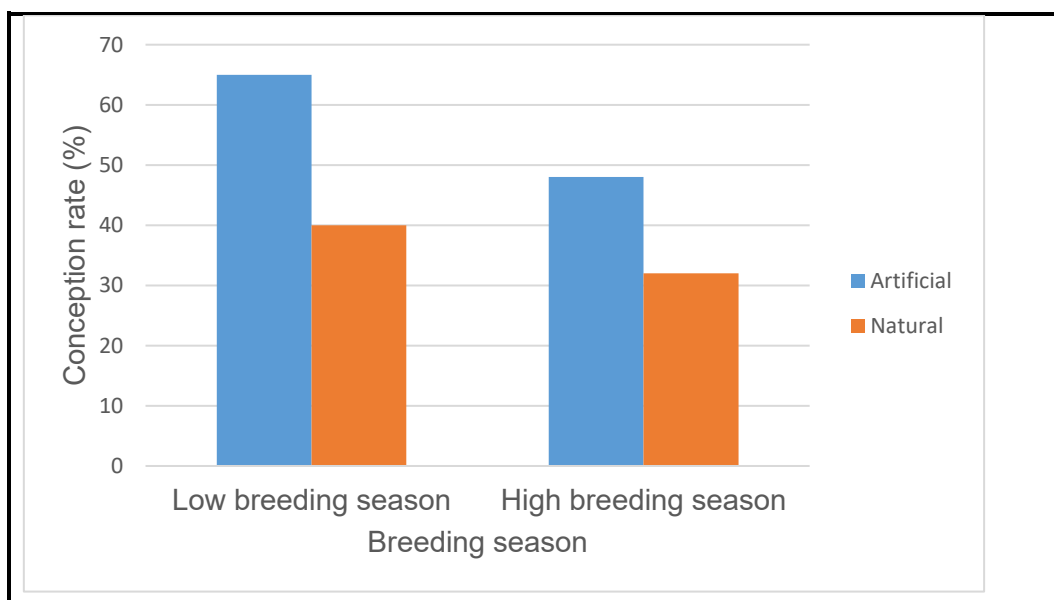
(1)

4.3.4 **Identification of cell division at A**

Mitosis ✓ because chromosome number is maintained in daughter cells ✓

(2)

4.4 4.4.1 **Comparison conception rates during natural and artificial insemination**



Checklist

- Correct heading ✓
- X axis correctly calibrated with label (Breeding season) ✓
- Y axis correctly calibrated with label (Conception rate) ✓
- Graph type (Bar graph) ✓
- Correct units (%) ✓
- Accuracy ✓ (80% and more correct plotting)

(6)

4.4.2 Conclusion

Artificial insemination results in higher conception rates ✓ in both low and high breeding seasons ✓ (2)

4.5 4.5.1 Situation that will happen during parturition

Dystocia ✓ (1)

4.5.2 Birth postures

(a) Retention of one leg (1)

(b) Posterior presentation (1)

4.5.3 Signs of a cow approaching parturition

- Milk leaks from the teats ✓
- Restlessness ✓
- Nesting behaviour ✓
- Attempts to urinate often ✓
- Isolates itself from other animals ✓ (Any 2 x 1) (2)

4.5.4 Causes of premature termination of pregnancy

- Infectious agents ✓
- Severe heat stress ✓
- Nutritional deficiencies ✓
- Toxicities ✓
- Trauma ✓
- Genetic issues ✓
- Hormonal imbalances ✓
- Stress ✓ (Any 2 x 1) (2)

[35]**TOTAL SECTION B: 105****GRAND TOTAL: 150**