Province of the
EASTERN CAPE
EDUCATION

Iphondo leMpuma Kapa: Isebe leMfundo
Provinsie van die Oos Kaap: Department van Onderwys
Porafensie Ya Kapa Botjahabela: Lefapha la Thuto

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)

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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 **Adapatations of part J that allows it to perform its function**
- Thick, muscular walls ✓
- Tough inner lining ✓
- Ingested grit/small stones ✓ (Any 2) (2)

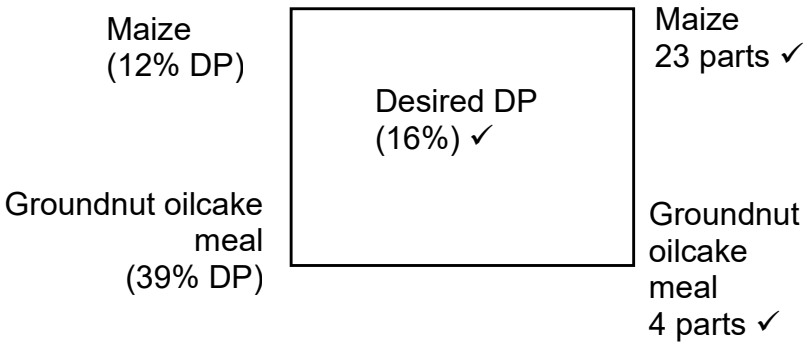
2.2 2.2.1 **Most expensive feed**
Feed A ✓ (1)

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**



Ratio of groundnut oil-cake meal**:** Maize
23 **:** 4 ✓ (4)

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
= $\frac{89}{100}$ x 18 kg
=16,02 kg ✓
Dry matter excreted = 100% - 60% of 6 kg
= 40% of 6 kg
= $\frac{40}{100}$ x 6 kg
= 2,4 kg ✓
Digestibility co-efficient = $\frac{Dry\ matter\ intake - Dry\ matter\ excreted}{Dry\ matter\ intake}$ x 100 ✓
= $\frac{16.02\ kg - 2.4\ kg}{16.02\ kg}$ x 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)

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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)

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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)

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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)

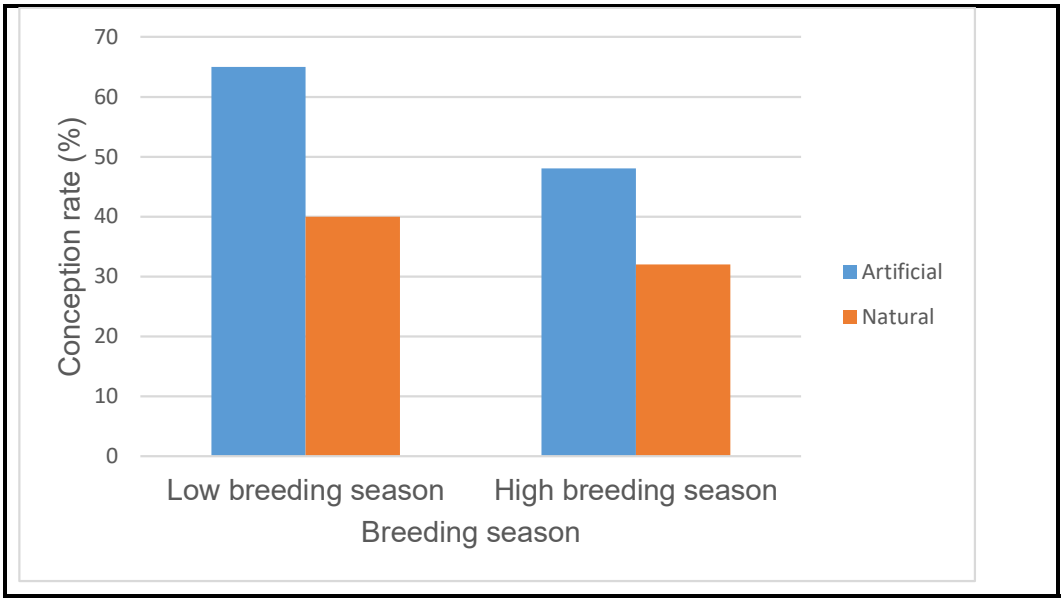
4.3 4.3.1 **Identification of the process in the diagram**
Spermatogenesis ✓ (1)

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)

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TOTAL SECTION B: 105
GRAND TOTAL: 150

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