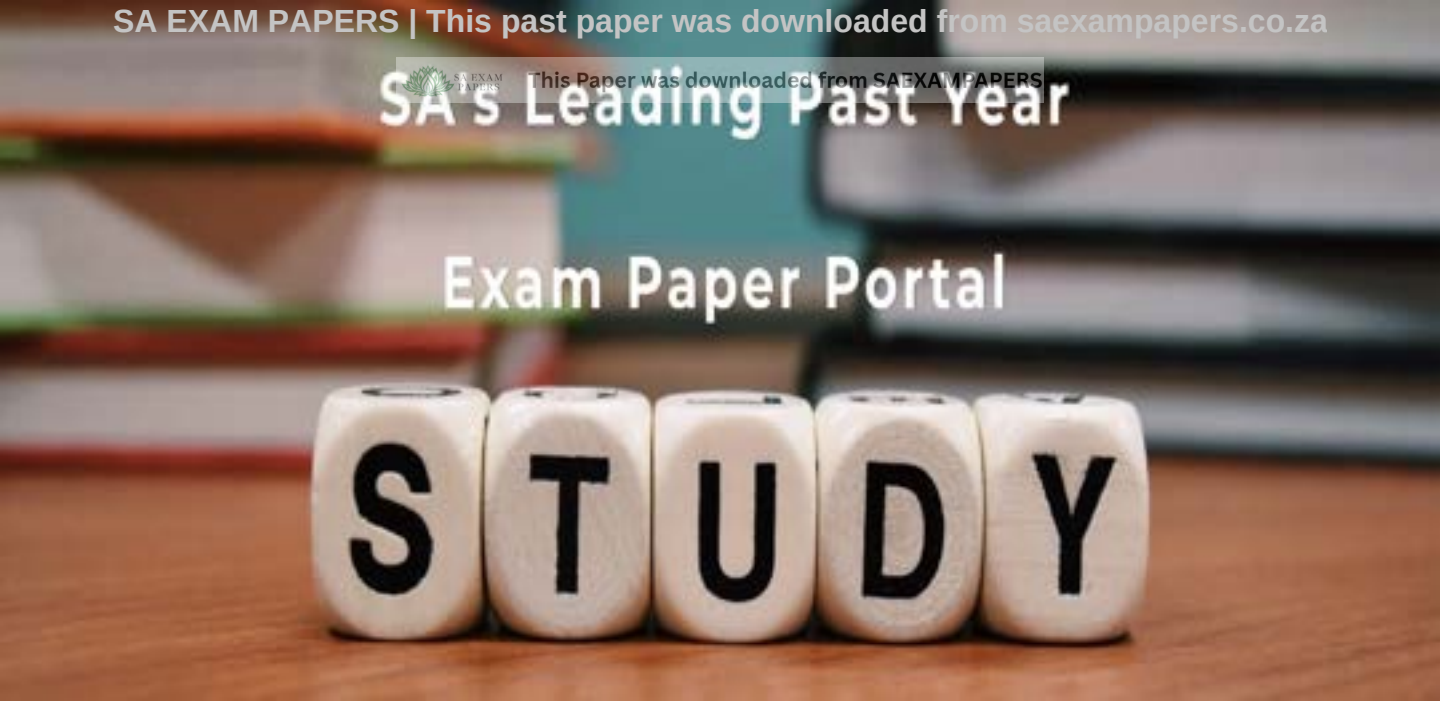

Province of the EASTERN CAPE EDUCATION

Iphondo leMpuma Kapa: Isebe leMfundo
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NATIONAL SENIOR CERTIFICATE

GRADE 12

SEPTEMBER 2025

AGRICULTURAL SCIENCES PAPER 1 MARKING GUIDELINE

MARKS: 150

This marking guideline consists of 12 pages.

SECTION A

QUESTION 1

1.1	1.1.1	A ✓✓		
	1.1.2	C ✓✓		
	1.1.3	D ✓✓		
	1.1.4	C ✓✓		
	1.1.5	C ✓✓		
	1.1.6	B ✓✓		
	1.1.7	D ✓✓		
	1.1.8	A ✓✓		
	1.1.9	A ✓✓		
	1.1.10	B ✓✓	(10 x 2)	(20)
1.2	1.2.1	Both A and B ✓✓		
	1.2.2	A only ✓✓		
	1.2.3	B only ✓✓		
	1.2.4	Both A and B ✓✓		
	1.2.5	A only ✓✓	(5 x 2)	(10)
1.3	1.3.1	Net energy/ NE ✓✓		
	1.3.2	Mite ✓✓		
	1.3.3	Pedometer ✓✓		
	1.3.4	Freemartin ✓✓		
	1.3.5	Colostrum ✓✓	(5 x 2)	(10)
1.4	1.4.1	Molasses ✓		
	1.4.2	Commercial ✓		
	1.4.3	Metritis ✓		
	1.4.4	Dystocia ✓		
	1.4.5	Sterility ✓	(5 x 1)	(5)

TOTAL SECTION A: 45

SECTION B

QUESTION 2: ANIMAL NUTRITION

2.1 **Stomachs of a farm animal.**

2.1.1 **Stomach classification**
Ruminant ✓ (1)

2.1.2 **Collective name for stomachs in the pictures**
Fore stomachs ✓ (1)

2.1.3 **Identification of the stomachs with the LETTERS.**
(a) A ✓ (1)
(b) C ✓ (1)
(c) B ✓ (1)

2.1.4 **Stomach parts regarded as true stomachs.**
(a) Abomasum ✓ (1)
(b) Proventriculus ✓ (1)

2.1.5 **Reason for regarding them as true stomachs.**
- Secretes gastric juices ✓
- Chemical digestion occurs there ✓ (Any 1) (1)

2.2 **Types of feeds**

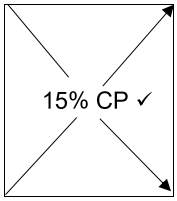
2.2.1 **Feeds classification in PICTURES A and B**
PICTURE A - Roughage ✓ (1)
PICTURE B - Concentrate ✓ (1)

2.2.2 **Identification of appropriate feed.**
(a) A ✓ (1)
(b) B ✓ (1)
(c) B ✓ (1)

2.3 **Balancing a ration**

2.3.1 **Method used by farmers to balance rations.**
Pearson square ✓ (1)

2.3.2 **Calculation of the ratio to balance a ration**



Ratio of Maize meal: Sunflower oilcake meal is 34 : 3 ✓ (4)

2.3.3 **Cost of maize in a ton of the ration**
Cost of maize meal = 34/37 x 1 000kg = 918,9 kg ✓
= 918,9kg ✓
= (R3 500 x 918.9)/1 000 ✓
= R3 216,15 ✓ (4)

2.4 **Feeding program**

2.4.1 **Nutritive ratio (NR) for feed B**
% TDN – % DP = % NPN
78 – 13 = 65 ✓

NR = 1 : $\frac{\text{\% digestible non-nitrogen nutrients}}{\text{\% digestible protein}}$ ✓
= 1 : $\frac{65}{13}$
= 1 : 5 ✓ (3)

2.4.2 **Feed type that will be most suitable to raise heifers.**
Feed B ✓ (1)

2.4.3 **Justification of answer to QUESTION 2.4.2**
NR is less than 1 : 6/ narrow NR ✓ which means the feed is rich in proteins ✓ which are required for growth ✓ (3)

2.5 **Matching of supplement with given statement**

2.5.1 **Thyroid regulators**
Growth stimulants ✓ (1)

2.5.2 **Intake controlled by salt concentration**
Non-protein nitrogen (NPN) ✓ (1)

2.5.3 **Injections mixed in drinking water and supplementary rations**
Minerals ✓ (1)

2.6 **Biological value (BV)**

2.6.1 **Ideal protein with 100 BV**
Egg protein ✓ (1)

2.6.2 **Explanation of not feeding ruminants with high BV protein**
Rumen microbes can convert protein of low BV to high BV ✓ (2)
[35]

QUESTION 3: ANIMAL PRODUCTION, PROTECTION AND CONTROL

3.1 Production systems

3.1.1 Identification of production system

PICTURE A – Intensive ✓ (1)
PICTURE B – Extensive ✓ (1)

3.1.2 Comparison of production systems in the pictures A and B

FACTORS	PICTURE A	PICTURE B	
Labour	Labour intensive/ high labour use ✓	Less labour input ✓	(2)
Output	Large ✓	Small ✓	(2)

3.1.3 TWO equipment controlling environmental conditions in PICTURE A

- Insulation ✓
- Ventilation ✓
- Heating ✓
- Fans ✓
- Air conditioners ✓ (Any 2) (2)

3.2 Animal shelter

3.2.1 Structure in the picture

Feed shed ✓ (1)

3.2.2 TWO shelter requirements guidelines

- Size should accommodate the number of cows ✓
- Proper roof ✓
- Should be close to the milking parlour ✓
- Ensure that the construction of the room will keep rats and mice out ✓
- Entrance must be locked to prevent theft ✓ (Any 2) (2)

3.3 Equipment used in the intensive housing system

3.3.1 Equipment in A and B

A – Nipple drinkers ✓ (1)

B – Feeders ✓ (1)

3.3.2 **Type of lighting specially designed for livestock**
Fluorescent ✓
Infrared light ✓ (Any 1) (1)

3.4 **Animal behaviour**

3.4.1 **Points labelled A and B**
A – Flight zone ✓ (1)
B – Blind spot ✓ (1)

3.4.2 **Point of balance**
D ✓ (1)

3.4.3 **TWO consequences of approaching an animal from direction B.**
- The animal lashes out/injures the handler ✓
- The animal flees ✓
- The animal is startled ✓ (Any 2) (2)

3.4.4 ONE abnormal behaviour shown by pigs when under stress.

- Tail biting ✓
- Cannibalism ✓
- Belly nibbling ✓
- Snout rubbing ✓
- Hyperactivity ✓ (Any 1)

3.5 **Animal health**

3.5.1 **Methods of testing animal health**
A – Taking animals temperature ✓ (1)
B – Checking animal pulse rate ✓ (1)

3.5.2 **Method of administering medication in PICTURE C**
Injection ✓ (1)

3.5.3 **TWO other methods of medicine administration.**
Topical application ✓
Oral administration ✓
Drenching ✓
Mixing with food ✓
Dipping/ foot/ belly dips/ spray race ✓ (Any 2) (2)

3.5.4 **Distinction between chronic and per acute levels of seriousness in animal disease**
Chronic – long-lasting, recurring repeatedly ✓
Per acute – severe symptoms and sudden in onset✓ (2)

3.6 **Animal diseases**

3.6.1 **Classification of the disease**
Protozoan ✓ (1)

3.6.2 **Disease caused by the infestation**
Heart water ✓ (1)

3.6.3 **TWO symptoms displayed by an infected animal**
- Uncoordinated movements ✓
- Diarrhoea ✓
- Nervousness ✓
- Listlessness ✓
- Difficulty breathing ✓ (Any 2) (2)

3.6.4 **TWO economic implications of animal diseases**
- Poor production/Decreased production ✓
- High treatment costs ✓
- Export bans on animals and animal products ✓
- Loss of profit/income ✓
- Death of livestock ✓
- Loss of jobs ✓ (Any 2) (2)

3.6.5 **TWO control measures for animal disease**
- Isolation of sick animals to prevent the spread of diseases ✓
- Strict hygiene and sanitary measures ✓
- Breed animals resistant to diseases ✓
- Control of external parasites/dipping ✓
- Provide well balanced nutrition to strengthen animal immune system ✓
- Ensure good herd management with good health programme suitable to the area where animals are kept. ✓

(Any 2) (2)
[35]

QUESTION 4: ANIMAL REPRODUCTION

4.1 Reproductive organs of a farm animal

4.1.1 **Parts labelled C, D and E**

C – Urethra ✓ (1)

D – Testes ✓ (1)

E – Scrotum ✓ (1)

4.1.2 **LETTER indicating the answer**

(a) **Nourishes the sperm cells**
A ✓ (1)

(b) **Regulates the temperature of a primary reproductive organ in the male animal**
E ✓ (1)

(c) **Allows the spermatozoa to mature**
B ✓ (1)

4.1.3 **Congenital defect in C**
Hypoplasia ✓
Cryptorchidism ✓ (Any 1) (1)

4.2 Oestrus cycle

4.2.1 **Identification of stages B and D in the diagram**
B – Oestrus ✓ (1)

D – Di-oestrus ✓ (1)

4.2.2 **Motivation for answers B and D**
Oestrus is the shortest stage ✓ while Di-oestrus is the longest stage ✓ (2)

4.2.3 **TWO behavioural signs of oestrus**
- Increased restlessness and activity ✓
- Vocalisations (like bellowing or grunting) ✓
- Mounting or attempting to mount other animals, ✓
- A swollen, reddened vulva with mucus discharge ✓ (Any 2) (2)

4.2.4 **Identification of oestrus stage**
(a) A ✓ (1)
(b) D ✓ (1)

4.3 **Procedure in animal reproduction**

4.3.1 **Identification of procedure**
Artificial insemination ✓ (1)

4.3.2 **Name of tool used to perform the procedure**
Pistolette ✓ (1)

4.3.3 **TWO requirements for a successful artificial insemination**
- Correct timing ✓
- Correct insemination technique ✓
- Use of healthy, viable and disease free semen. ✓
- Use of sterile equipment ✓ (Any 2) (2)

4.3.4 **Best time to inseminate cows**
12 hours after ✓ standing heat ✓

OR

In the morning after the cow has shown signs of oestrus in the afternoon. ✓ (2)
In the afternoon after the cow has shown signs of oestrus in the morning. ✓

4.4 **Reproduction procedure**

4.4.1 **Procedure in the diagram above**
Embryo transfer ✓ (1)

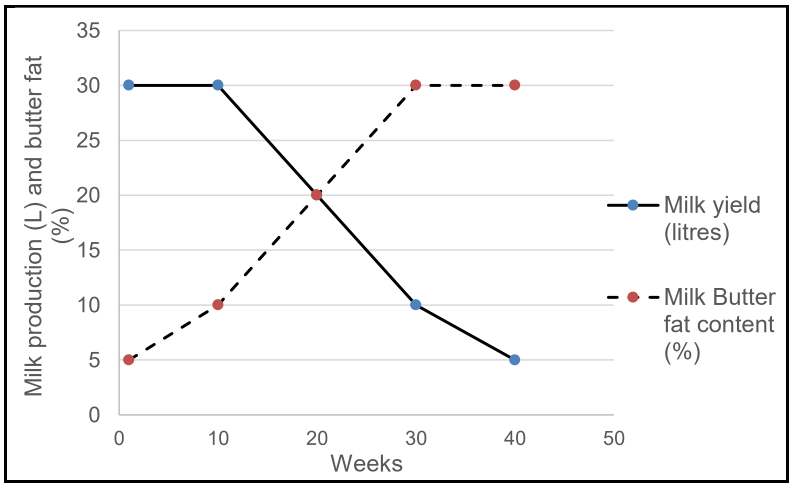
4.4.2 **Animals in labels A and C**
A – Donor cow ✓ (1)
C – Recipient cow/surrogate cows ✓ (1)

4.4.3 **Process taking place in B**
Superovulation ✓ (1)

4.4.4 **Justification for embryo transfer use by farmers**
- It allows for the rapid multiplication of offspring from genetically superior cows ✓
- Increases the selection intensity for female herd replacements ✓
- Can improve the overall genetic merit of a herd ✓ (Any 2) (2)

4.5 **Milk production**

4.5.1 **Milk production and butter fat content over a lactation period**



Criteria/rubric/marking guidelines

- Correct heading ✓
- X-axis – correctly calibrated and labelled (Weeks) ✓
- Y-axis – correctly calibrated and labelled (milk yield and butter fat) ✓
- Correct units (litres and %) ✓
- Accuracy (80%+ correct plotting) ✓
- Graph type (Line graph) ✓ (6)

4.5.2 **Graph trend**

When milk production is at its highest, ✓ the butter fat is at its lowest and vice versa. ✓

OR

Butterfat is inversely proportional ✓ to milk production. ✓ (Any 2) (2)

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TOTAL SECTION B: 105
GRAND TOTAL: 150