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

SEPTEMBER 2026

AGRICULTURAL SCIENCES P1

MARKS: **150**

TIME: **2½ hours**

This question paper consists of 14 pages.

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INSTRUCTIONS AND INFORMATION

1. This question paper consists of TWO sections, namely SECTION A and SECTION B.
2. Answer ALL the questions in the ANSWER BOOK.
3. Start each question on a NEW page.
4. Number the answers correctly according to the numbering system used in this question paper.
5. You may use a non-programmable calculator.
6. Show ALL calculations, including formulae, where applicable.
7. Write neatly and legibly.

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SECTION A

QUESTION 1

1.1 Various options are provided as possible answers to the following questions. Choose the answer and write only the letter (A–D) next to the question numbers (1.1.1 to 1.1.10) in the ANSWER BOOK, for example 1.1.11 D.

1.1.1 The end products of digestion that are absorbed in the rumen.

A Volatile fatty acids
B Fatty acids
C Amino acids
D Sugars

1.1.2 A glandular stomach of a fowl where enzymatic digestion takes place.

A Ventriculus
B Gullet
C Proventriculus
D Gizzard

1.1.3 The following statements explain wide nutritive ratio.

(i) Low DP and NR greater than 1 : 6
(ii) High fibre and NR greater than 1 : 6
(iii) Low fibre and lower TDN content
(iv) High fibre and low DP

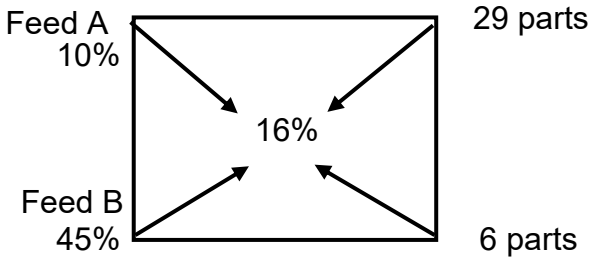
Choose the CORRECT combination:

A (i), (ii) and (iii)
B (i), (iii) and (iv)
C (i), (ii) and (iv)
D (ii), (iii) and (iv)

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1.1.4 The ratio in the mixture of two feeds results to:



(i) Feed B is a protein rich ration
(ii) 6 parts need to be added to Feed A to balance the ration
(iii) 6 parts need to be added to Feed B to balance a ration
(iv) An amount of ration to be added to Feed A, is 82,9%

Choose the CORRECT combination:

A (i), (ii) and (iii)
B (i), (iii) and (iv)
C (i), (ii) and (iv)
D (ii), (iii) and (iv)

1.1.5 Produces for both household consumption and market sale, using moderate technology.

A Subsistence farming
B Commercial farming
C Large scale farming
D Small-scale farming

1.1.6 ONE of the statements below is NOT required information in the permit during animal transportation.

A Type of animal
B Driver's license
C Number of animals
D Date

1.1.7 A tiny organism that can cause disease or illness in a host, like a human, animal, or plant.

A Virus
B Vector
C Germ
D Pathogen

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1.1.8 A specialised, often automatic, syringe-like tool used to orally administer liquid medication, dewormers, or nutritional supplements directly into the mouth of livestock such as cattle, sheep, and goats.

A Drenching gun
B Spray race
C Balling gun
D Injection

1.1.9 The CORRECT position for a cow that is about to give birth is the … position.

A anterior
B ventral
C dorsal
D posterior

1.1.10 ONE of the following factors cause sterility in bulls.

A Conformational abnormality
B Congenital defects
C Lack of libido
D Malnutrition (10 x 2) (20)

1.2 Indicate whether each of the descriptions in COLUMN B applies to **A ONLY, B ONLY, BOTH A** and **B** or **NONE** of the items in COLUMN A. Write **A only, B only**; **both A and B** or **none,** next to the question numbers (1.2.1 to 1.2.5) in the ANSWER BOOK, for example 1.2.6 B only.

COLUMN A			COLUMN B
1.2.1	A:	Roughage	Feeds that have a small percentage of total digestible nutrients (<60%) in small volume
	B:	Concentrate	
1.2.2	A:	Digestibility coefficient	Calculating the exact quantities of feeds that must be included in the feed mixture to balance a ration
	B:	Nutritive ratio	
1.2.3	A:	Free range	Allows for natural foraging
	B:	Battery system	
1.2.4	A:	Mastitis	A highly contagious chronic bacterial disease leading to a significant reproductive loss
	B:	Brucellosis	
1.2.5	A:	Follicle stimulating hormone	Pro-oestrus is characterised by the secretion of hormone/s …
	B:	Oestrogen	

(5 x 2) (10)

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1.3 Give ONE word/phrase for each of the following descriptions. Write ONLY the term next to the question numbers (1.3.1 to 1.3.5) in the ANSWER BOOK.

1.3.1 An enzyme that changes proteins to peptides

1.3.2 Diseases that are transmitted from animals to humans and vice versa

1.3.3 Production of many ova by a cow treated with hormones

1.3.4 Yellowish, salty and creamy liquid secreted from the mammary gland at parturition

1.3.5 Twins that develop from a single ovum to form a zygote which then splits spontaneously into two identical embryos (5 x 2) (10)

1.4 Change the UNDERLINED WORD(S) in each of the following statements to make them TRUE. Write only the answer next to the question numbers (1.4.1 to 1.4.5) in the ANSWER BOOK.

1.4.1 <u>Hormones</u> increase the palatability and digestibility of poor roughage.

1.4.2 Intense itching, hair loss, crusty lesions, and thick skin that often starts on the head, ears, or legs is caused by <u>ticks</u>.

1.4.3 The solid ball consisting of sixteen cells called <u>blastocyst</u> reaches uterus about four days after fertilisation.

1.4.4 <u>Embryo transplant</u> is a technique where one single organism with superior heritable characteristics is manipulated to produce offspring that is genetically identical to it.

1.4.5 <u>Amnion</u> membrane eliminates waste products from the foetus before it is born. (5 x 1) (5)

TOTAL SECTION A: 45

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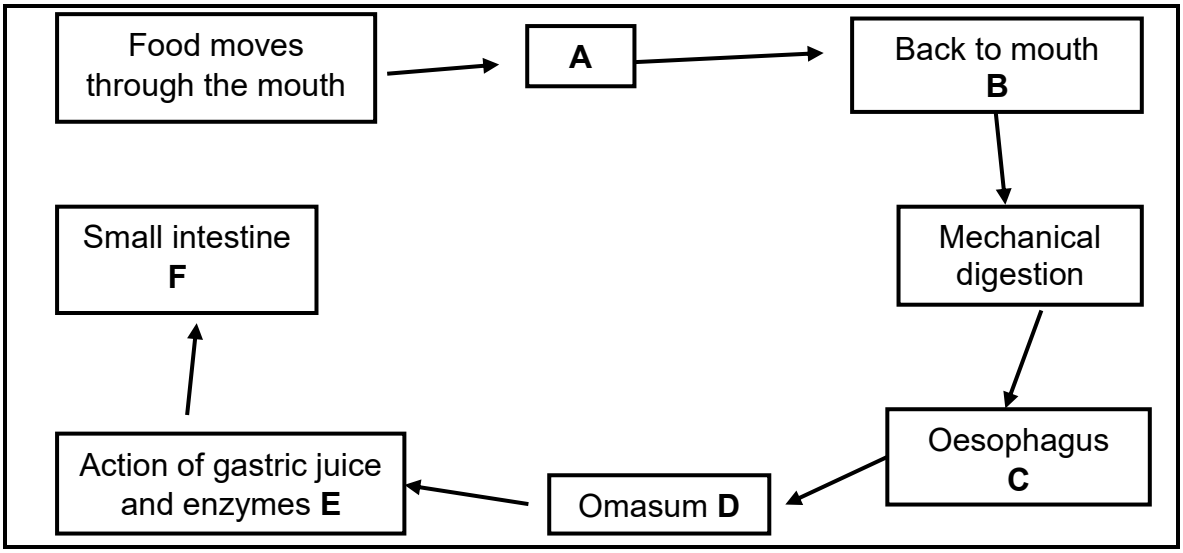
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SECTION B

QUESTION 2: ANIMAL NUTRITION

Start this question on a NEW page.

2.1 The illustration below shows a path of food in a farm animal.



2.1.1 Classify the farm animal in the illustration above. (1)

2.1.2 Identify the parts labelled **A** and **E**. (2)

2.1.3 Explain the process in **B**. (2)

2.1.4 Identify with a LETTER the parts in the illustration where the following occurs:

(a) Grinding and filtration of food material (1)

(b) Absorption of digested food particles (1)

2.2 There are billions of microbes that live in a symbiotic manner in the rumen of ruminants. If the ruminant is fed with a diet containing high levels of fibre and low levels of starch the rumen will be equipped with more fibre digesting microbes. If the feed is suddenly changed to high starch and low fibre, the animal will not be able to digest the feed properly because millions of the microbes that digest fibre will die off.

2.2.1 Identify TWO rumen microbes performing functions that are illustrated in the scenario above. (2)

2.2.2 Indicate the requirements for the normal functioning of rumen microbes under the following:

(a) Temperatures (1)

(b) pH (1)

2.2.3 Indicate TWO functions of rumen microbes in a ruminant stomach. (2)

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2.3 Vitamins and minerals are essential for animal health. If an animal is deficient of any vitamin in its feed, it shows symptoms. Below are animals showing deficiency symptoms caused by lack of certain nutrients in their feed.

ANIMAL A	ANIMAL B
	

2.3.1 Identify the deficiency symptoms shown in ANIMALS **A** and **B**. (2)

2.3.2 Indicate the mineral imbalances that might have caused the animal's behaviour in **B**. (1)

2.4 The table below relates to the biological value of feedstuffs from plant and animal origin.

ANIMAL FEED STUFF	BIOLOGICAL VALUE (BV) %
Egg	100
Wheat	45
Milk protein	95
Fish meal	90
Maize	50
Groundnuts	60

2.4.1 Name the type of protein that is accepted as a comparative protein. (1)

2.4.2 Explain why the BV of maize is lower than that of milk protein. (2)

2.4.3 Draw a bar graph comparing the biological values of protein in different feedstuff. (6)

2.4.4 Deduce the trend of biological values in the feedstuff shown. (2)

2.5 A lactating dairy cow was fed fishmeal with a gross energy (GE) value of 19,2 MJ/kg of dry matter (DM) intake. After the feed was digested and absorbed in the digestive tract, 41% was lost in the faeces and 2,5% in urine, 8% in fermentation gases and 15% in body heat.

2.5.1 Calculate the nett energy (NE) per kg of a fishmeal consumed by a cow. (4)

2.5.2 Interpret the implication of the calculation above. (2)

2.6 The coefficient of digestibility is a measure of the digestibility of a feed. Indicate TWO factors in which the coefficient of digestibility is expressed. (2)

[35]

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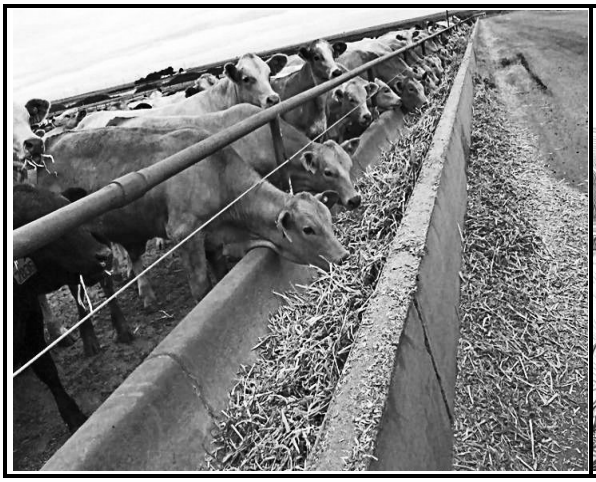
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QUESTION 3: ANIMAL PRODUCTION, PROTECTION AND CONTROL

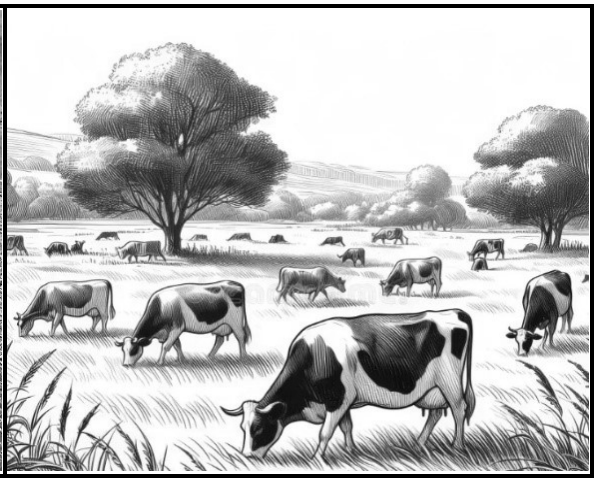
Start this question on a NEW page.

3.1 Below are pictures of farm animals in two different production systems.

PICTURE A



PICTURE B



3.1.1 Identify the production systems in PICTURES **A** and **B**. (2)

3.1.2 Justify the answer in QUESTION 3.1.1 above. (2)

3.1.3 Name the structure in PICTURE **A**. (1)

3.1.4 Explain the relationship between extreme temperatures and feed intake of animals in PICTURE **B**. (2)

3.2 Equipment in the housing systems.

PICTURE A



PICTURE B



3.2.1 Identify the equipment in the housing system in PICTURE **A**. (1)

3.2.2 Indicate the material on the floor of a poultry production. (1)

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3.2.3 Explain TWO importance of the material in QUESTION 3.2.2. (2)

3.2.4 Mention TWO abnormal behaviours that animals in PICTURE **B** display under stress. (2)

3.2.5 Explain how the farmer can increase production in extensive beef production under the following:

(a) TWO for general production enterprise management (2)

(b) TWO for reproduction/ breeding (2)

3.3 Study the pictures below of livestock in a restrained environment.

PICTURE A	PICTURE B
	

3.3.1 Identify the facility in PICTURE **B** above. (1)

3.3.2 Indicate TWO visible differences in the PICTURE **A** and **B** above that need to be considered when handling livestock in such facilities. (2)

3.3.3 Mention TWO reasons for handling farm animals. (2)

3.4 The picture below shows an animal with health issues.



3.4.1 Identify the disease that is depicted in the picture above. (1)

3.4.2 Classify the disease mentioned in QUESTION 3.4.1 above. (1)

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3.4.3 Indicate whether the disease is infectious or not. (1)

3.4.4 Motivate with a reason the answer in QUESTION 3.4.3. (2)

3.4.5 Match the levels of seriousness in the box with the descriptions below.

chronic; metabolic; acute; notifiable; per acute

(a) Animals may be found dead without previous signs of the disease (1)

(b) Disease is long lasting and recur repeatedly in the same animal (1)

(c) Illness develops quickly and lasts only a short amount of time (1)

3.5 The picture below shows cattle with salt intake.



3.5.1 Identify the mineral element in the salt lick above. (1)

3.5.2 Indicate TWO visible symptoms shown by animals with salt poisoning. (2)

3.5.3 Explain TWO basic principles of good health to control animal diseases and pests. (2)

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QUESTION 4: ANIMAL REPRODUCTION

Start this question on a NEW page.

4.1 The diagrams below show the reproductive systems of a bull and a cow.

DIAGRAM A

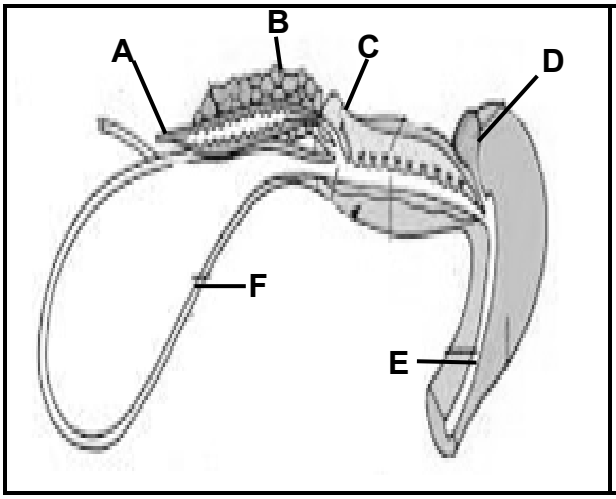
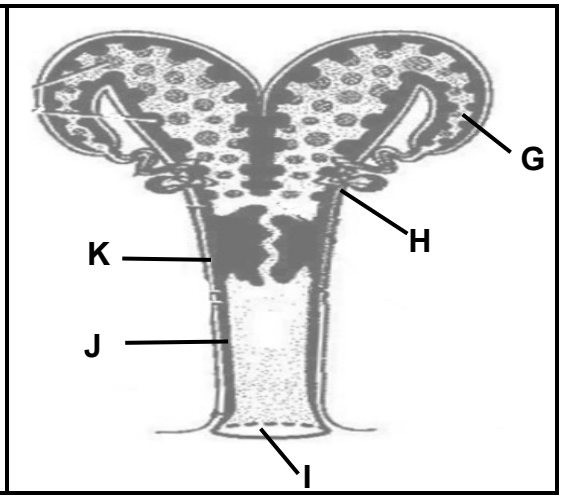


DIAGRAM B



4.1.1 Identify the parts labelled **B**, **D** and **G**. (3)

4.1.2 Indicate with a LETTER where the following occurs:

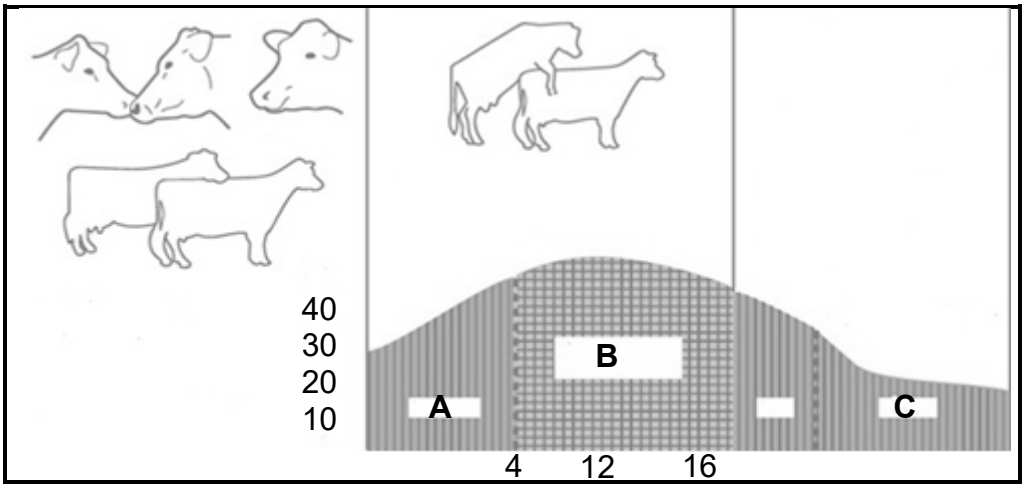
(a) Placement of semen during artificial insemination (1)

(b) Passage for excretion of urine in bulls (1)

(c) Flattened elastic tube that extends from cervix to the vulva (1)

4.2 The diagram below shows the sequential events in the reproduction process.

DIAGRAM 1 DIAGRAM 2 DIAGRAM 3



4.2.1 Identify the reproductive process in the diagram above. (1)

4.2.2 Explain TWO behavioural actions shown by the cow in stage **A** of DIAGRAM **2**. (2)

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4.2.3 Deduce the hormone that is labelled **B**. (1)

4.2.4 Justify with a reason the answer to QUESTION 4.2.3. (2)

4.2.5 Predict what would happen in hormone **C** levels if the cow has conceived. (2)

4.3 Below are the stages of natural mating behaviour in bulls. Re-arrange the stages sequentially by writing only the LETTER corresponding to the behaviour.

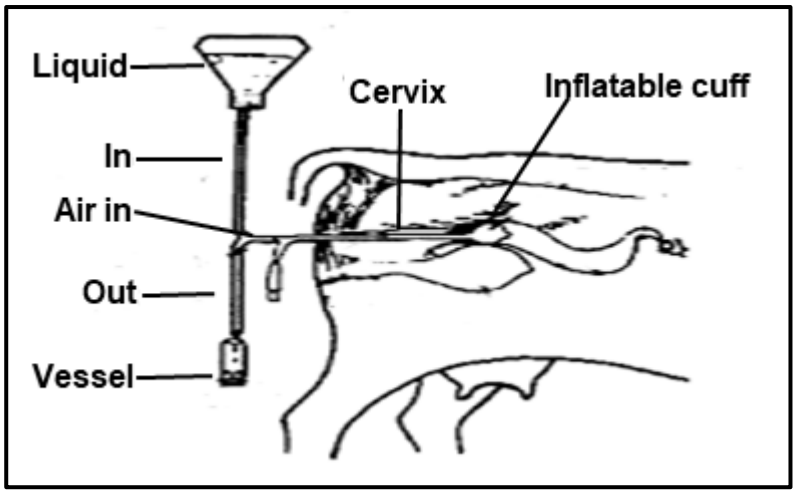
4.3.1
A The male animal will use his penis to penetrate the female animal's vagina.
B The male animal pulls off from the female animal.
C The female animal on standing heat will allow the male animal to mount on her.
D Males show the Flehman response and the erectile process of the penis starts.
E The male animal release semen into the front part of the vagina, close to the cervix. (5)

4.3.2 Describe TWO functions for each of the following dilutants in the stored semen.

(a) Egg yolk (2)

(b) Antibiotics (2)

4.4 Study the diagram below that shows a reproductive procedure in livestock.



4.4.1 Identify the procedure in the diagram above. (1)

4.4.2 Identify the animal in the procedure. (1)

4.4.3 Define the procedure in QUESTION 4.4.1. (2)

4.4.4 Indicate TWO aims of the procedure in QUESTION 4.4.1. (2)

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4.5 The animal below shows a phase of parturition.



4.5.1 Identify the stage of parturition shown in the picture above. (1)

4.5.2 Name TWO conditions which might interfere with normal parturition process. (2)

4.5.3 The milk ejection reflex is the release of milk from the udder. It occurs instinctively and cannot be consciously controlled by the animal. It is initiated by the stimulation of the central nervous system.

(a) Mention the hormone that stimulates the milk release. (1)

(b) Indicate TWO stimuli to the answer provided in QUESTION 4.5.3(a). (2)

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TOTAL SECTION B: 105
GRAND TOTAL: 150

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