



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATIONS/ NATIONAL SENIOR CERTIFICATE EXAMINATIONS

AGRICULTURAL SCIENCES P1

MAY/JUNE 2026

MARKS: 150

TIME: 2½ hours

This question paper consists of 19 pages.



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. Read the questions carefully.
4. Answer ONLY what has been asked.
5. Start EACH question on a NEW page.
6. Number the answers correctly according to the numbering system used in this question paper.
7. You may use a non-programmable calculator.
8. Show ALL calculations, including formulae, where applicable.
9. Write neatly and legibly.



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, e.g. 1.1.11 B.

1.1.1 The breaking down of food particles by enzymes and digestive juices to simple soluble substances that can be absorbed:

- A Mechanical digestion
- B Chemical digestion
- C Physical digestion
- D Electronic digestion

1.1.2 The glands in the duodenum that produce an alkaline fluid to protect the lining of the duodenum from acids:

- A Islets of Langerhans
- B Brunner's glands
- C Glands of Lieberkühn
- D Endocrine glands

1.1.3 ONE of the following processes is NOT part of rumination in farm animals:

- A Regurgitation
- B Re-mastication
- C Re-swallowing
- D Assimilation

1.1.4 The correct sequence of processes that occur in the body of an animal:

- A Absorption → ingestion → assimilation → digestion
- B Absorption → assimilation → excretion → ingestion
- C Ingestion → digestion → absorption → assimilation
- D Digestion → ingestion → absorption → excretion

1.1.5 The following occurs when the environmental temperature decreases:

- (i) Animals eat much more to maintain body temperature
- (ii) The body metabolism and heat production increase
- (iii) Animals eat less and lose a lot of heat
- (iv) Animals eat more but production drops

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



1.1.6 A system of keeping egg layers in small wire cages for their entire productive life:

- A Battery system
- B Backyard system
- C Free-range system
- D Feedlot system

1.1.7 ONE of the following can be poisonous to animals when it is used as a source of non-protein nitrogen for ruminants:

- A Thorn apple
- B Maize fungus
- C Urea
- D Poisonous bulb

1.1.8 The sustainable use of medication entails the following:

- (i) Ensure the medication is safe for the specific animal
- (ii) Check the expiry date of the medication
- (iii) Animal products can be consumed a day after administering medication
- (iv) Use the correct dosage and type of administering medication

Choose the CORRECT combination:

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

1.1.9 ONE of the following is NOT a sign of approaching parturition in female farm animals:

- A Cow urinates and defaecates often
- B The foetal membranes prevent the release of amniotic fluid
- C Strings of mucus hang from the vagina
- D Dilation of the cervix

1.1.10 The CORRECT order of the reproductive processes in cows:

- A Mating → fertilisation → gestation → parturition → lactation
- B Mating → gestation → fertilisation → lactation → parturition
- C Mating → parturition → gestation → fertilisation → lactation
- D Fertilisation → mating → parturition → gestation → lactation

(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, e.g. 1.2.6 B only.

COLUMN A			COLUMN B
1.2.1	A:	Zinc	Required in small quantities by animals
	B:	Sulphur	
1.2.2	A:	Tranquilisers	Substances given to animals to regulate metabolism
	B:	Antibiotics	
1.2.3	A:	Plywood board	A tool that is used to handle large farm animals
	B:	Nose pliers	
1.2.4	A:	Intramuscular	A method of administering medication to farm animals through injection
	B:	Subcutaneous	
1.2.5	A:	Smell	The sense stimulated by the presence of pheromones in the urine of a cow
	B:	Touch	

(5 x 2) (10)

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

- 1.3.1 A semi-liquid mass produced in the stomach as a result of churning of the bolus
- 1.3.2 Diseases that are caused by disorders which disturb the processes in the animal body
- 1.3.3 The stage of parturition characterised by the contraction of the uterine muscles
- 1.3.4 The substance used as a dilutant to control the pH of semen
- 1.3.5 A collective term that describes the defects of the reproductive organs that an animal displays at birth

(5 x 2) (10)

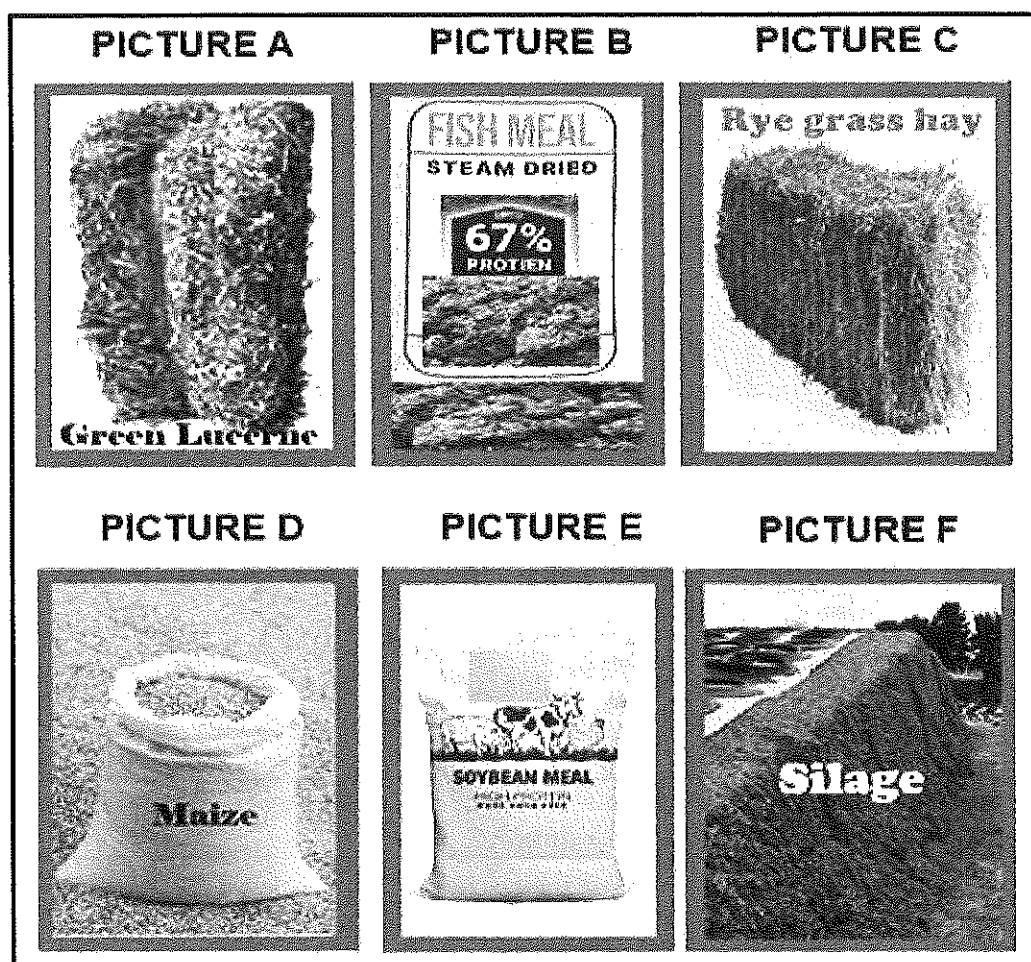


- 1.4 Change the UNDERLINED WORD(S) in each of the following statements to make them TRUE. Write only the answer next to the question numbers (1.4.1 to 1.4.5) in the ANSWER BOOK.
- 1.4.1 The net energy is released as heat when a feed is completely oxidised to carbon dioxide, water and gases.
- 1.4.2 The removal of dirty wet wool around the tail and rear limb areas of sheep is known as docking.
- 1.4.3 The umbilical cord connects the developing foetus to the uterine wall to allow for elimination of waste products and gaseous exchange to take place.
- 1.4.4 Sperm ducts in the testes are responsible for the formation of the spermatozoa.
- 1.4.5 A female calf in a set of different sex twins that is sterile due to high levels of the male sex hormone is referred to as fraternal. (5 x 1) (5)

TOTAL SECTION A: 45



2.4 The pictures below show different types of feeds.



2.4.1 Classify EACH of the following feeds in:

(a) PICTURE A (1)

(b) PICTURE F (1)

2.4.2 Identify a feed in the pictures above that represents EACH of the following:

(a) A succulent roughage (1)

(b) A protein-rich concentrate of plant origin (1)

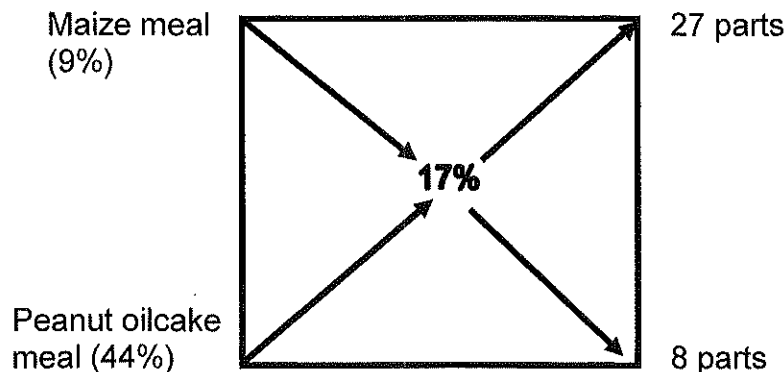
2.4.3 Explain the importance of feeding 8-week-old calves with the feed in PICTURE C. (2)

2.4.4 The feed in PICTURE E has total digestible nutrients (TDN) of 85% and digestible protein (DP) of 34%.

Calculate the nutritive ratio (NR) of the feed. (3)



- 2.5 The diagram below shows a method that was used to balance the ration for a herd of dairy cattle.



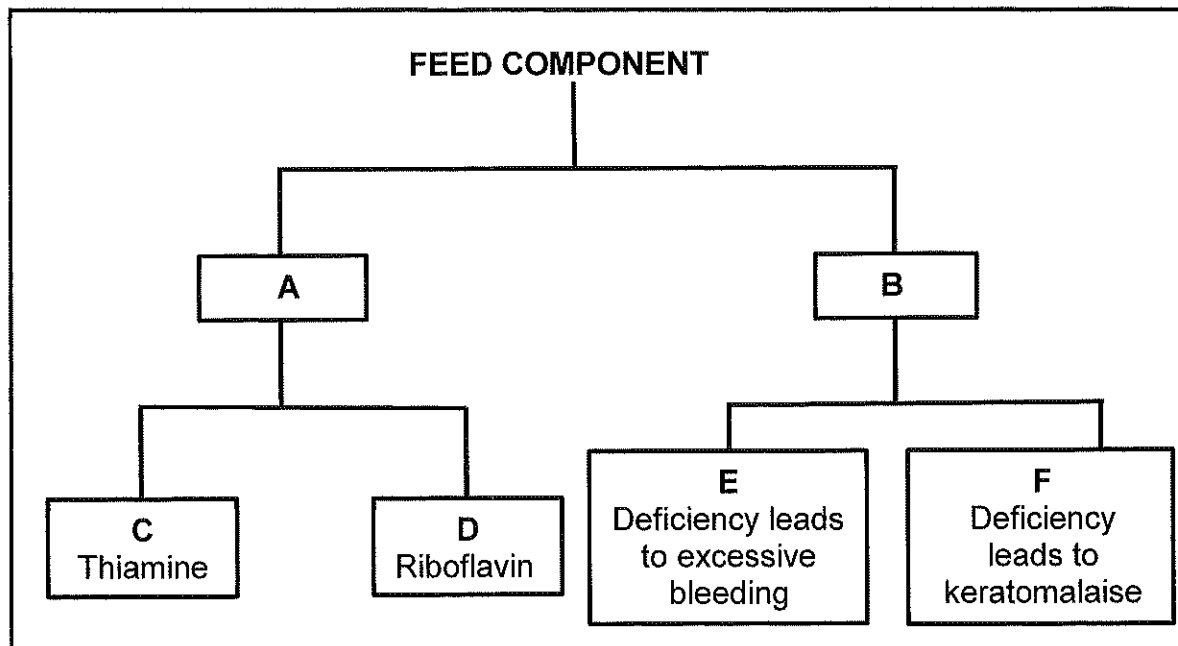
- 2.5.1 Name the method that was used to balance the ration in the diagram above. (1)
- 2.5.2 Identify the ratio at which the two feeds should be mixed using the method illustrated above. (1)
- 2.5.3 Deduce the amount of digestible protein that will be provided to dairy cows fed with the above feed mixture. (1)

- 2.6 **Poor planning, inefficient production practices and adverse weather conditions contribute to inadequate fodder supply.**

- 2.6.1 Describe the fodder flow programme that farmers use to ensure a consistent supply of fodder. (2)
- 2.6.2 Name the type of ration that provides the minimum daily nutrients needed by farm animals to survive. (1)
- 2.6.3 The farmer in the scenario above has 25 cows that weigh an average of 500 kg each, with a daily dry matter (DM) intake of 10 kg.
- Calculate the total monthly dry matter (DM) needed for the herd. (3)
- [35]**



2.2 The flow chart below illustrates a feed component.



2.2.1 Identify the feed component illustrated in the flow chart above. (1)

2.2.2 Name the category of the feed component identified in QUESTION 2.2.1. (1)

2.2.3 Indicate the letter in the flow chart above which matches EACH of the following statements:

(a) Prevents nervous symptoms in animals (1)

(b) Its deficiency leads to polyneuritis (1)

2.2.4 Name the feed component associated with the deficiency in F. (1)

2.3 A young growing animal consumed 13 kg of dry maize stalk and excreted 8 kg of dry manure.

2.3.1 Explain what could have influenced the digestibility of the maize stalk. (3)

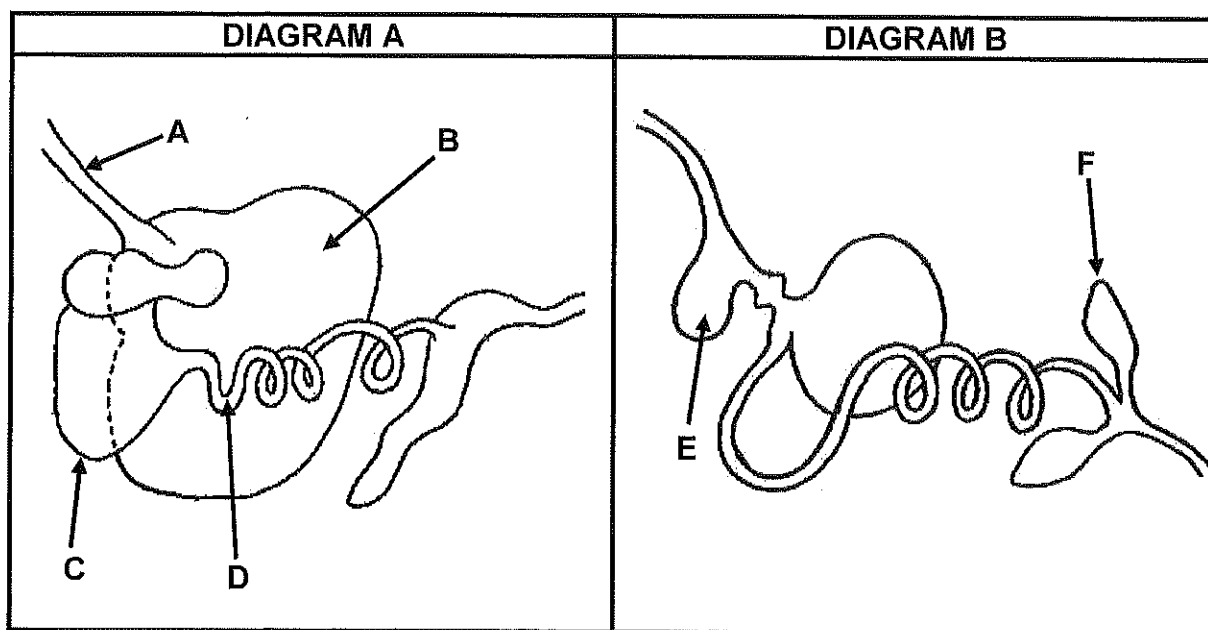
2.3.2 State TWO methods that could be used to improve the digestibility of the maize stalk above. (2)



SECTION B**QUESTION 2: ANIMAL NUTRITION**

Start this question on a NEW page.

2.1 The diagrams below show the alimentary canals of two different farm animals.



- 2.1.1 Name the farm animal represented in DIAGRAM B. (1)
- 2.1.2 Justify the answer to QUESTION 2.1.1. (1)
- 2.1.3 Describe the digestion of protein in part C and part D in DIAGRAM A. (2)
- 2.1.4 Indicate ONE way in which animals benefit from micro-organisms in part B. (1)
- 2.1.5 Compare part A and part E in terms of their functions. (2)



QUESTION 3: ANIMAL PRODUCTION, PROTECTION AND CONTROL

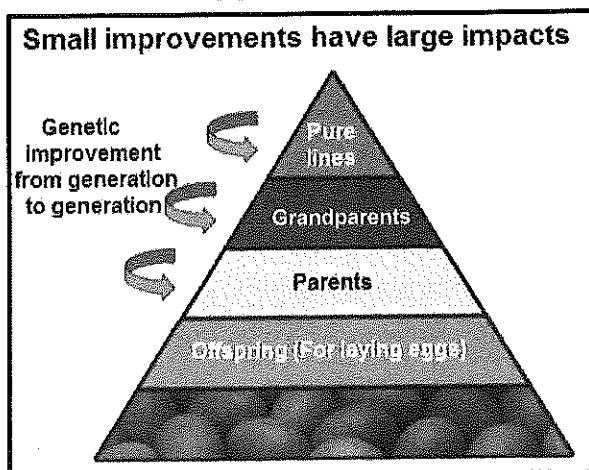
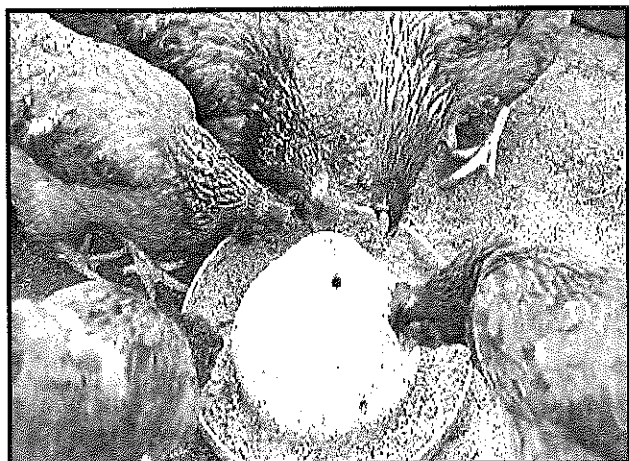
Start this question on a NEW page.

- 3.1 The descriptions below show characteristics of different production and farming systems practised on farms.

FARM A Low population density, lower input, lower labour costs, lower yield per area and environmentally friendly	FARM B High population density, higher labour costs, higher investment, use of modern technology and high environmental impact
FARM C Maximised production, increased sales volume and making higher profit	FARM D Simpler, low costs, low productivity, primarily to meet family needs and only surplus is sold

Identify a farm in the descriptions above with characteristics that match EACH of the following:

- (a) Subsistence farming system (1)
- (b) Intensive production system (1)
- (c) Extensive production system (1)
- (d) Commercial farming system (1)
- 3.2 The pictures below represent factors that increase broiler production with intensive farming.

PICTURE A**PICTURE B**

- 3.2.1 Identify the factors which increase animal production that are represented in EACH of the following:

- (a) PICTURE A (1)
- (b) PICTURE B (1)



3.2.2 Explain how the factor represented by PICTURE B can increase broiler production. (2)

3.3 Match the effects of incorrect handling (A–C) listed below with the following statements (3.3.1.to 3.3.3):

Write ONLY the letter of the effect next to the question numbers, e.g. 3.3.4 D.

- A Animals will either flee or fight.
- B Animals will be injured.
- C They will be stressed and difficult to handle.

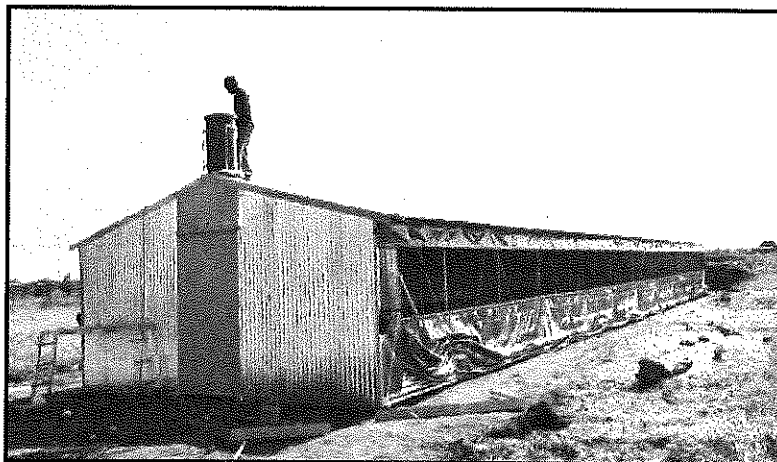
3.3.1 Approaching animals from their blind spot (1)

3.3.2 Shouting at animals when herding them (1)

3.3.3 Catching sheep by the wool (1)

3.4 State TWO basic guidelines to be considered before loading animals in a truck. (2)

3.5 The picture below shows a housing facility for a broiler production unit.



3.5.1 State the purpose of housing the broilers in a facility as shown in the picture above. (1)

3.5.2 State ONE basic requirement of the housing facility in the picture above. (1)

3.5.3 Name TWO types of equipment that can be used inside the housing facility to reduce heat stress on broilers during summer. (2)

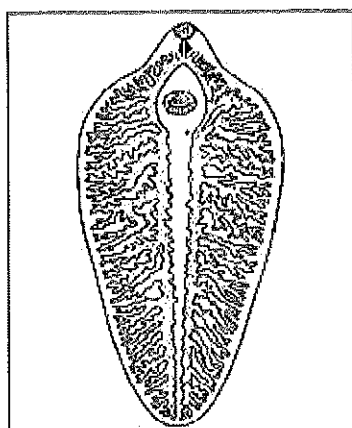


- 3.6 The table below shows the annual mortality rates of young and adult farm animals.

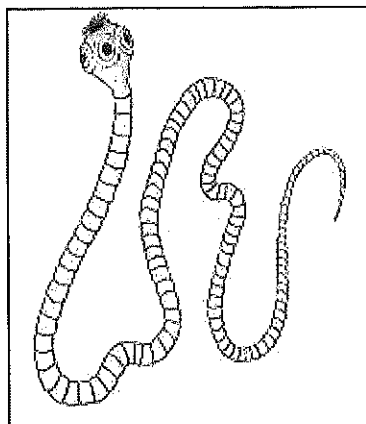
FARM ANIMALS	MORTALITY RATES IN PERCENTAGES (%)	
	YOUNG ANIMALS	ADULT ANIMALS
Cattle	22	6
Sheep	28	11
Goats	25	8
Chickens	70	30
Pigs	14	4

- 3.6.1 Give ONE general sign that will indicate ill health in pigs. (1)
- 3.6.2 Use the information in the table above to draw a combined bar graph showing the annual mortality rates of young and adult farm animals. (6)
- 3.7 Animal diseases are transmitted in different ways and farmers have to ensure that the spread of diseases is prevented.
- 3.7.1 Name the mode of transmitting EACH of the following diseases: (1)
- (a) Anthrax (1)
- (b) Rift Valley fever (1)
- 3.7.2 State TWO ways in which farmers can prevent the further spread of diseases once detected. (2)
- 3.8 The pictures below show organisms that cause poor health in farm animals.

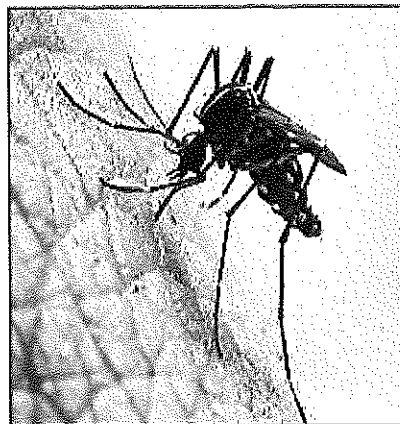
PICTURE A



PICTURE B



PICTURE C



- 3.8.1 Give the collective term for the organisms shown in the pictures above. (1)
- 3.8.2 Identify the picture above that applies to EACH of the following: (1)
- (a) Requires a snail to complete its life cycle (1)
- (b) A vector (1)



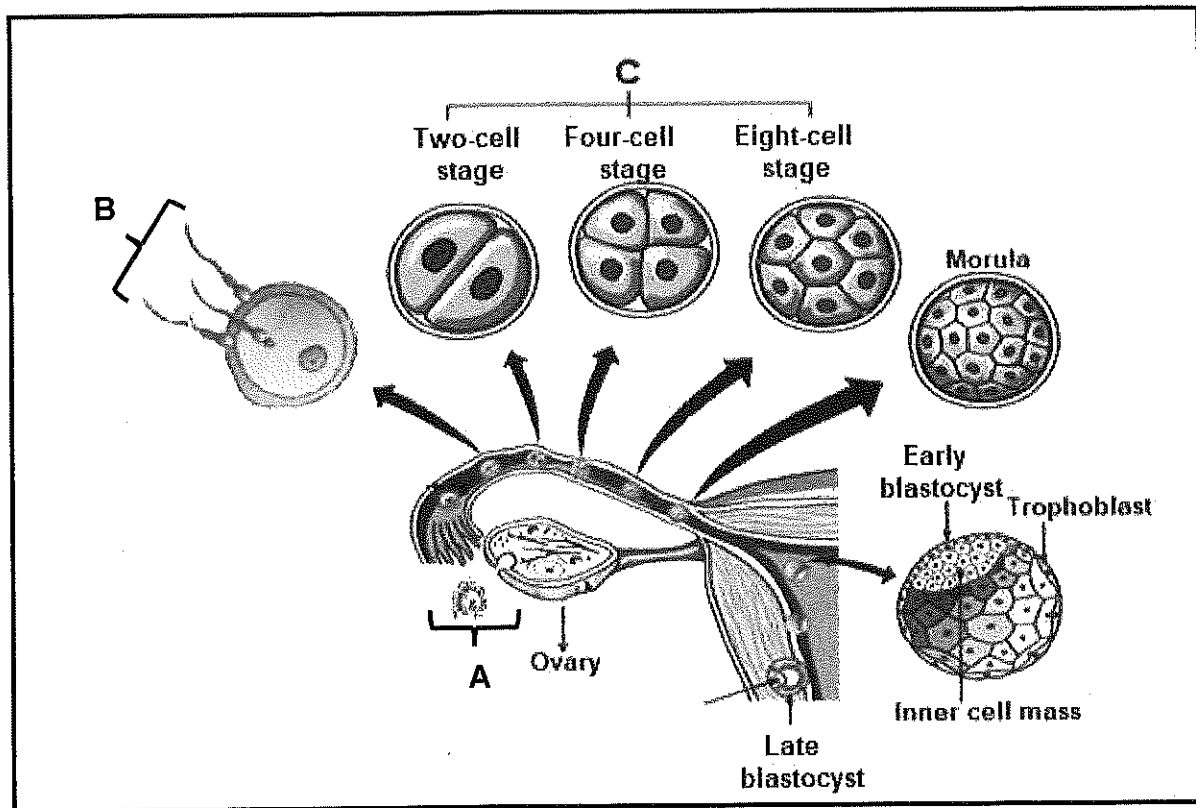
- 3.8.3 Differentiate between the organisms in PICTURE A and PICTURE C on the previous page, based on where they are found in the body of an animal. (2)
- 3.9 Consumption of excessive salts is a threat to the health of farm animals.
- 3.9.1 State ONE measure that a farmer can take to treat salt poisoning in farm animals. (1)
- 3.9.2 The state plays a major role in animal protection.
Give a reason to justify the statement. (1)
- [35]**



QUESTION 4: ANIMAL REPRODUCTION

Start this question on a NEW page.

- 4.1 The diagram below represents a female reproductive system and some reproductive processes.



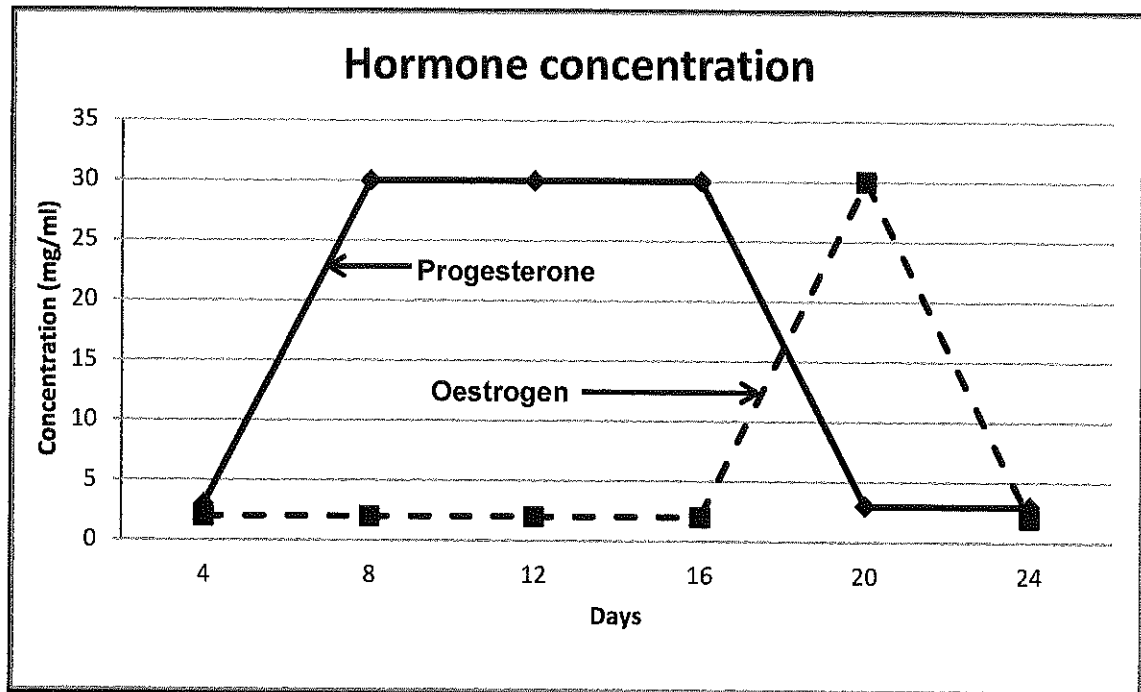
- 4.1.1 Name the reproductive process represented by A. (1)
- 4.1.2 Justify the answer to QUESTION 4.1.1. (1)
- 4.1.3 Describe the reproductive process represented by B. (2)
- 4.1.4 Name the type of cell division represented by C. (1)
- 4.1.5 State ONE function of the uterus. (1)

- 4.2 Rearrange the statements below, related to mating, in sequential order. Write only the letters (A–C) next to the question number (4.2).

- A Penetration of the vagina and release of semen (1)
- B Bull shows interest in the cow due to an increased level of pheromones (1)
- C Bull stands on hind legs with his chest on the rump of the cow (1)



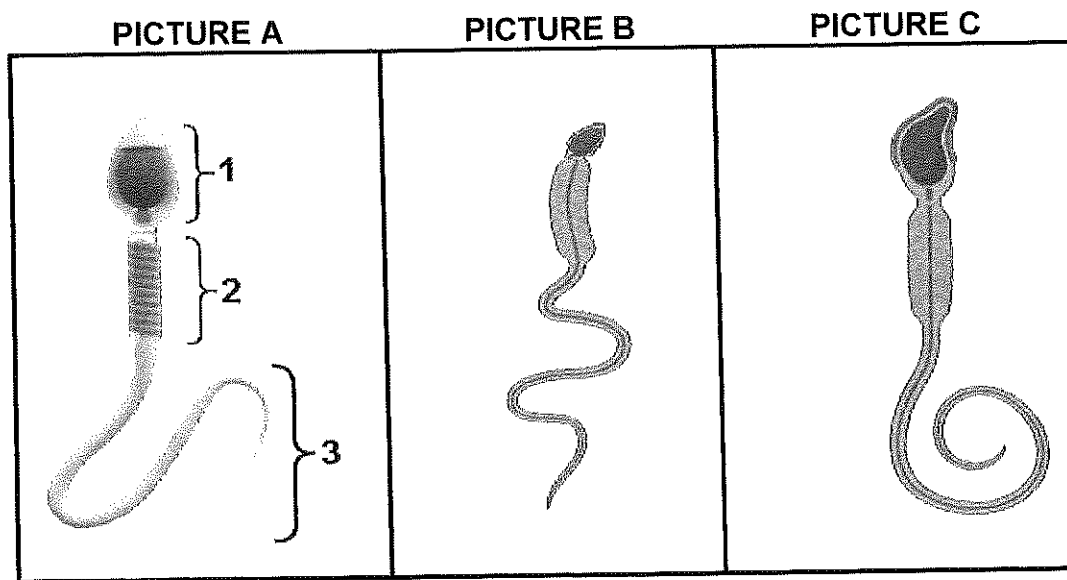
- 4.3 The graph below shows the concentration of two hormones during different stages of the reproductive cycle in cows.



- 4.3.1 Deduce from the graph above the concentration of progesterone on Day 12. (1)
- 4.3.2 Name the hormone responsible for EACH of the following: (1)
- (a) Increased blood supply to the uterus (1)
 - (b) Together with oestrogen it causes the follicle to rupture (1)
- 4.3.3 Describe the changes in progesterone concentration after fertilisation. (1)
- 4.3.4 Identify the stage of the oestrus cycle between Day 8 and Day 16. (1)
- 4.3.5 Explain the impact of progesterone during the stage identified in QUESTION 4.3.4. (2)



4.4 The pictures below show normal and abnormal sperm cells.



- 4.4.1 Identify the sperm cell with a morphological abnormality in the pictures above. (1)
- 4.4.2 Identify in PICTURE A the number of the part of the sperm cell responsible for EACH of the following: (1)
- (a) Mobility (1)
 - (b) Carrier of the genetic information (1)
- 4.4.3 Name the part that releases the enzyme responsible for sperm cell penetration into the ovum. (1)
- 4.4.4 Name the process whereby sperm cells are formed. (1)



- 4.5 The diagrams below illustrate different reproductive techniques in farm animals.

DIAGRAM 1

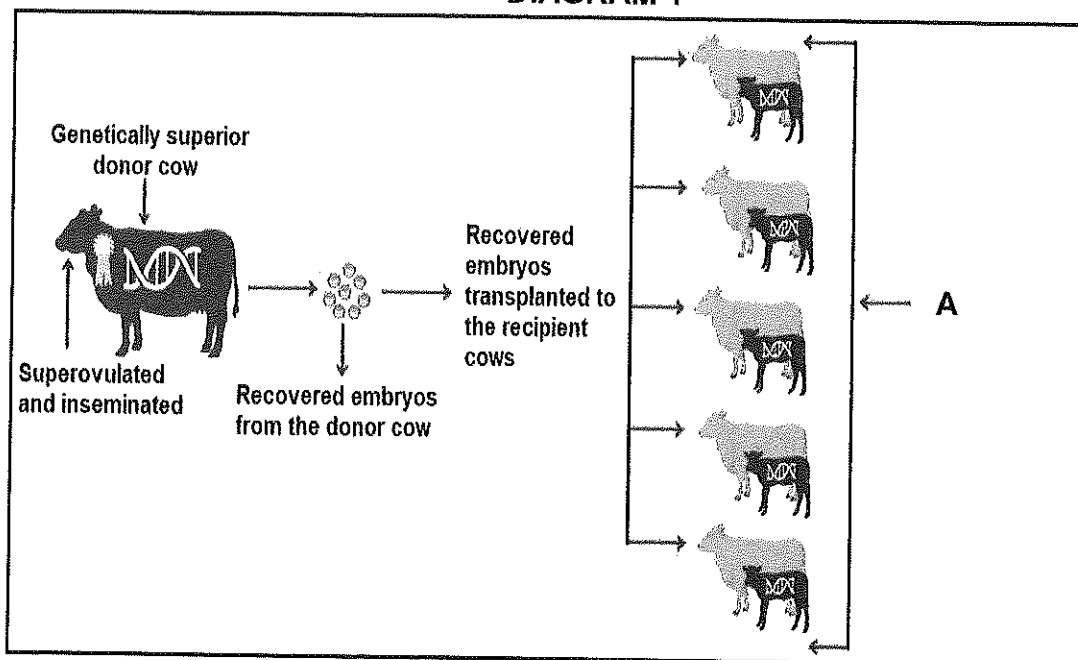
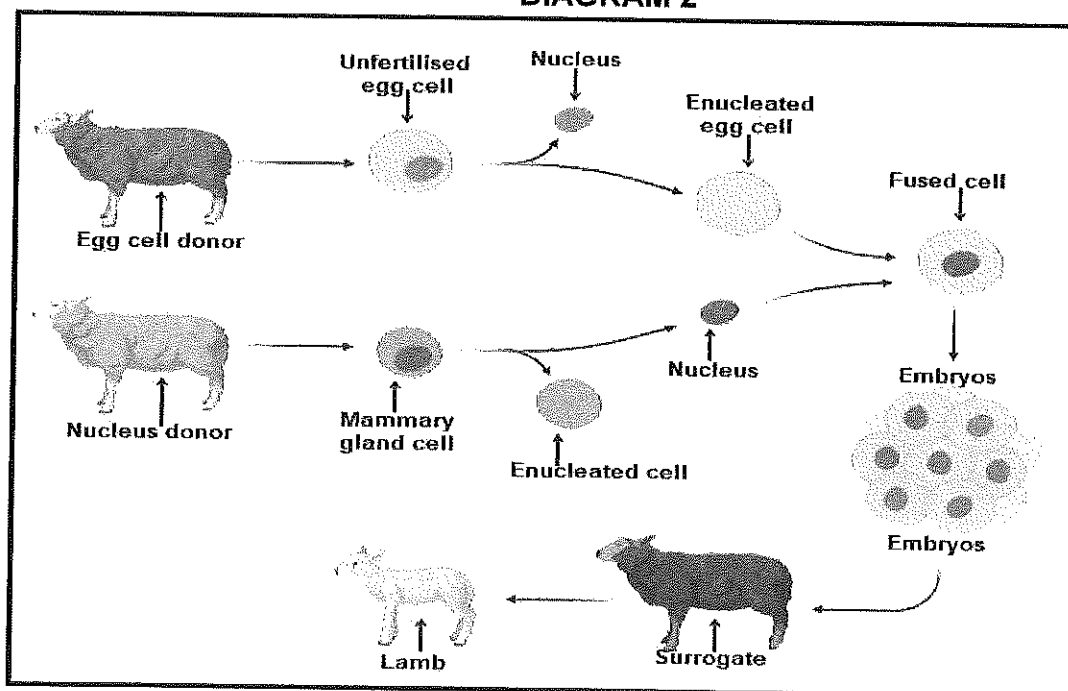


DIAGRAM 2



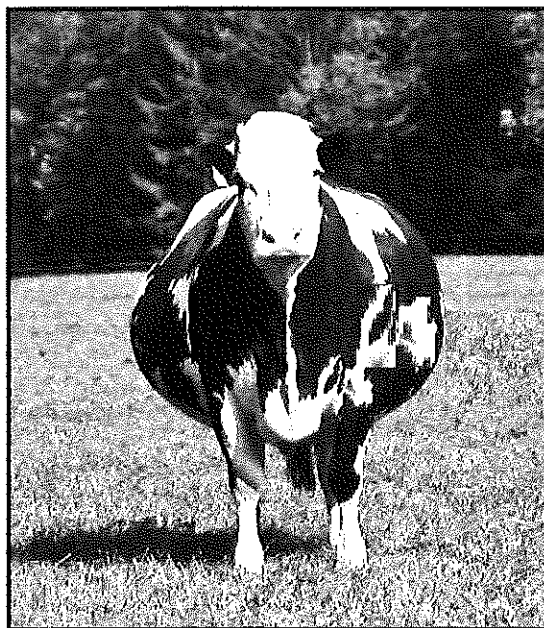
- 4.5.1 Identify the reproductive technique illustrated in DIAGRAM 1. (1)
- 4.5.2 Name the importance of the cows labelled **A** in DIAGRAM 1. (1)
- 4.5.3 Define the reproductive technique illustrated in DIAGRAM 2. (2)



4.5.4 Identify the sheep in DIAGRAM 2 that will be genetically identical to the lamb. (1)

4.5.5 Justify the answer to QUESTION 4.5.4. (1)

4.6 The picture below shows a cow in the third stage of pregnancy.



4.6.1 Name the third stage of pregnancy in which the cow is. (1)

4.6.2 Describe the second stage of pregnancy in a cow. (2)

4.6.3 State TWO calf-related possible causes of difficult birth that the cow is likely to experience. (2)

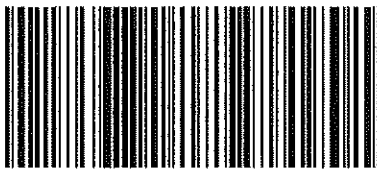
4.7 Lactation refers to the production of milk by farm animals.

4.7.1 Indicate the period of lactation in weeks, during which milk production starts to decline. (1)

4.7.2 Explain the relationship between milk production and butterfat content during the period indicated in QUESTION 4.7.1. (2)
[35]

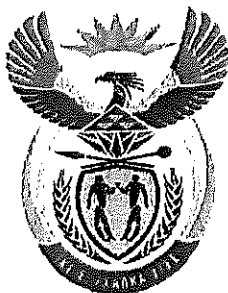
TOTAL SECTION B: 105
GRAND TOTAL: 150





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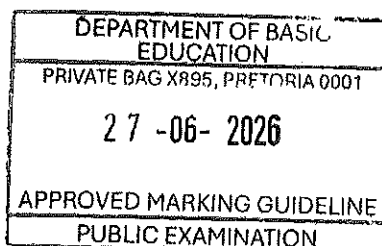
These marking guidelines consist of 11 pages.

APPROVED

UMALUSI Mr. AT Tshabang 27 June 2026	UMALUSI Dr. DN Mathobo 27 June 2026	INTERNAL MODERATOR Me. JN Mokhantso 27 June 2026	INTERNAL MODERATOR Mr. RA Seloane 27 June 2026

SECTION A**QUESTION 1**

1.1	1.1.1	B ✓✓	(10 x 2)	(20)
	1.1.2	B ✓✓		
	1.1.3	D ✓✓		
	1.1.4	C ✓✓		
	1.1.5	D ✓✓		
	1.1.6	A ✓✓		
	1.1.7	C ✓✓		
	1.1.8	D ✓✓		
	1.1.9	B ✓✓		
	1.1.10	A ✓✓		
1.2	1.2.1	A only ✓✓	(5 x 2)	(10)
	1.2.2	None ✓✓		
	1.2.3	B only ✓✓		
	1.2.4	Both A and B ✓✓		
	1.2.5	A only ✓✓		
1.3	1.3.1	Chyme ✓✓	(5 x 2)	(10)
	1.3.2	Metabolic diseases ✓✓		
	1.3.3	Preparatory ✓✓		
	1.3.4	Buffer/pH regulator ✓✓		
	1.3.5	Congenital ✓✓		
1.4	1.4.1	Gross energy/GE ✓	(5 x 1)	(5)
	1.4.2	Crutching ✓		
	1.4.3	Placenta ✓		
	1.4.4	Seminiferous tubules ✓		
	1.4.5	Freemartin ✓		

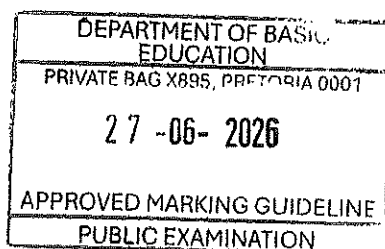
TOTAL SECTION A: 45

SECTION B**QUESTION 2: ANIMAL NUTRITION****2.1 The alimentary canals of two farm animals**

- 2.1.1 Farm animal represented in DIAGRAM B**
Fowl/chicken/poultry ✓ (1)
- 2.1.2 Justification of the answer**
- Presence of a crop ✓
 - Presence of proventriculus ✓
 - Presence of ventriculus/gizzard ✓
 - Presence of two caeca ✓ (Any 1) (1)
- 2.1.3 Description of protein digestion from part C/abomasum to part D/small intestine**
- Protein is converted by enzyme pepsin into peptides in part C ✓ (1)
 - The enzyme erepsin changes peptides to amino acids in part D ✓ (1)
- 2.1.4 ONE way in which micro-organisms in part B benefit animals**
- Breakdown roughages/cellulose to produce volatile fatty acids/fermentation ✓
 - Supply of water-soluble vitamins and vitamin K ✓
 - They benefit from amino acids synthesized through hydrolysis of protein and non-protein nitrogenous compounds ✓ (Any 1) (1)
- 2.1.5 Comparing the oesophagus and the crop in terms of functions**
- Part A/oesophagus** - Transports food from the mouth to the stomach and vice versa ✓ (1)
- Part E/crop** - Stores/moistens/softens food ✓ (1)

2.2 Feed component

- 2.2.1 Identification of the component of feed**
Vitamins ✓ (1)
- 2.2.2 The category of vitamins**
Water/fat soluble vitamins ✓ (1)
- 2.2.3 Indication of the letter of the component**
- (a) Preventing nervous symptoms in animals - C/D ✓ (1)
- (b) Its deficiency causes polyneuritis - C ✓ (1)
- 2.2.4 Name of feed component labelled F**
Vitamin A/retinol ✓ (1)

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AT

DN

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JN MA

2.3 Digestibility of feeds

2.3.1 Explanation of what would have influenced the digestibility of maize stalk

The high fibre content in maize stalk was poorly digested (only 5kg) was absorbed ✓ 8kg was excreted by the young growing animal ✓ due to the underdevelopment of the rumen and insufficient rumen micro-organisms for fibre digestion ✓

OR

The animal was a non-ruminant ✓ and was less able to digest feeds high in crude fibre content ✓ due to a lack of rumen micro-organisms ✓

(3)

2.3.2 TWO methods that could be used to improve the digestibility

- Grinding ✓
- Pelleting ✓
- Spraying with water/NPN/molasses mixture ✓
- Supplementation with molasses/NPN ✓

(Any 2)

(2)

2.4 Types of feeds

2.4.1 Classification of feeds

- (a) PICTURE A - Roughage ✓
- (b) PICTURE F - Roughage ✓

(1)

(1)

2.4.2 Identification of feeds

- (a) A succulent roughage - F (Silage)/A (Green Lucerne) ✓
- (b) A protein-rich concentrate of plant origin
E (Soya bean meal) ✓

(1)

(1)

2.4.3 Explanation for feeding roughage to 8 week old calves

Roughages stimulate the development of the fore-stomach ✓ which promotes proper digestion of feed high in crude fibre and overall well-being of rumen ✓

(2)

2.4.4 Calculation of the nutritive ratio of the feed

$$NR = 1: \frac{\%TDN - \%DP}{\%DP} \quad \checkmark$$

$$NR = 1: \frac{85\% - 34\%}{34\%} \quad \checkmark$$

$$NR = 1:1,5/1:2 \quad \checkmark$$

OR

$$NR = 1: \frac{\%DNNS}{\%DP} \quad \checkmark$$

$$NR = 1: \frac{51\%}{34\%} \quad \checkmark$$

$$NR = 1:1,5/1:2 \quad \checkmark$$

(3)

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2.5 Pearson square method

- 2.5.1 **Name of the method**
Pearson square ✓ (1)
- 2.5.2 **Identification of the ratio**
Maize meal : Peanut oilcake meal
27 : 8 ✓ (1)
- 2.5.3 **Deduction of the amount of digestible protein for the mixture**
17% ✓ (1)

2.6 Formulation of ration

- 2.6.1 **Description of fodder flow programme**
A management strategy by farmers to ensure that livestock have sufficient feed ✓ throughout the year ✓ (2)
- 2.6.2 **Type of the ration**
Maintenance ration ✓ (1)
- 2.6.3 **Calculation of the total monthly DM needed**
 - Per day: 25 cows x 10 kg DM/cow = 250 kg DM ✓
 - 250 kg/day x 30 days ✓
 - = 7 500 kg DM/month ✓
(3)
[35]

QUESTION 3: ANIMAL PRODUCTION, PROTECTION AND CONTROL**3.1 Production systems and farming systems****Identification of a farm**

- (a) FARM D ✓ (1)
- (b) FARM B ✓ (1)
- (c) FARM A ✓ (1)
- (d) FARM C ✓ (1)

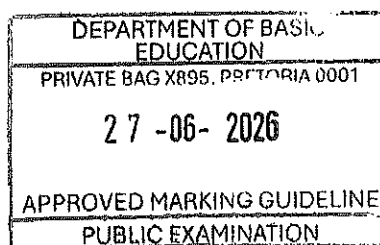
3.2 Animal production

- 3.2.1 **Identification of the factors to increase animal production**
 - (a) PICTURE A - Breeding/reproduction ✓ (1)
 - (b) PICTURE B - Nutrition/feeding ✓ (1)
- 3.2.2 **Description of how nutrition can increase broiler production**
Proper nutrition gives farm animals vigour to grow/develop/strong immunity to fight off infections ✓ leading to more profitable and sustainable agriculture ✓ (2)

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3.3 Effects of incorrect handling of farm animals

- 3.3.1 A ✓ (1)
- 3.3.2 C ✓ (1)
- 3.3.3 B ✓ (1)

3.4 TWO basic guidelines to be considered before loading animals

- Familiarise animals with loading area ✓
- Group animals before loading them so that they establish social groups ✓
- Ensure that the truck/loading zone is suitable for the type of animal ✓
- Keep animals calm in preparation for the trip ✓
- Do not feed animals two hours before they are loaded ✓
- Separate animals according to type, sex and age ✓
- Separate sick/pregnant animals ✓
- Floors should not be slippery ✓
- Disinfect the truck prior to loading animals ✓
- Proper documentation must be available ✓ (Any 2) (2)

3.5 Housing facility**3.5.1 Purpose of a broiler housing facility**

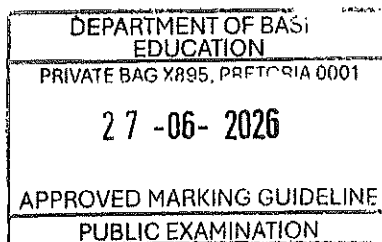
- To create a suitable environment for maximum growth and production ✓
- Protection against predators ✓ (Any 1) (1)

3.5.2 ONE basic requirement of the housing facility

- House is oriented lengthwise in a north-south direction and short sides facing east-west ✓
- Proper lighting ✓
- Side walls built in such a way to allow for air movement ✓
- Corrugated iron increases temperature during winter months ✓
- House have the foldable curtains to regulate temperature ✓
- Roof has an A-frame to improve air circulation ✓ (Any 1) (1)

3.5.3 TWO equipment to reduce heat stress in summer

- Air conditioner/evaporative cooling pads ✓
- Foggers/mist sprays ✓
- Fans ✓
- Foldable curtains/ventilators ✓ (Any 2) (2)

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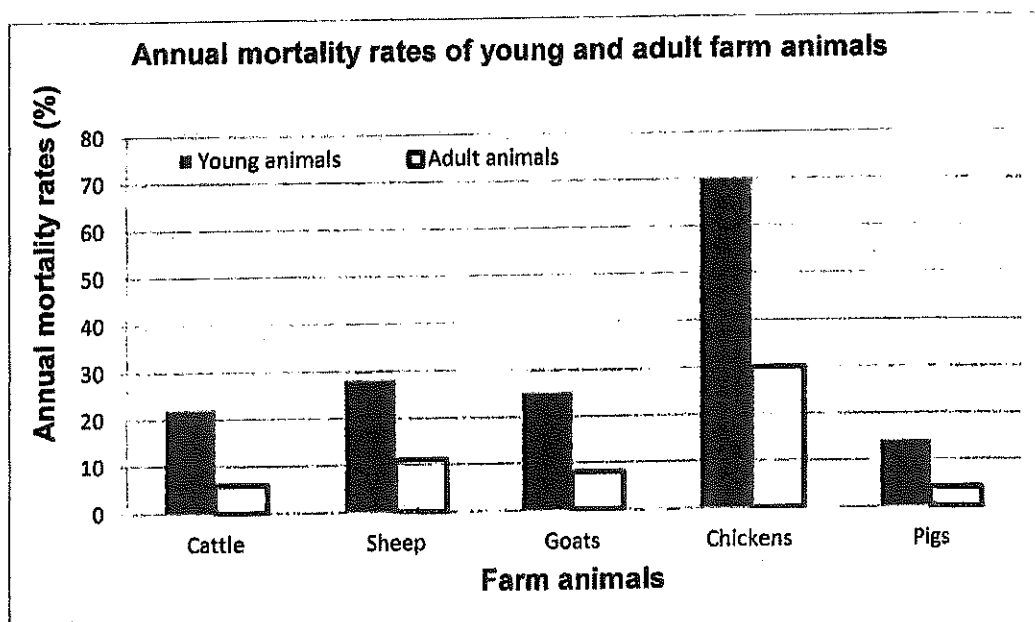
3.6 Health and mortality rates in farm animals

3.6.1 ONE general sign of ill-health in pigs

- Loss of appetite ✓
- Isolation from the group ✓
- Listlessness ✓
- Swollen navel, udder or joints ✓
- Rapid, irregular breathing ✓
- Shivering ✓
- Coughing ✓
- Discoloured skin/blisters ✓
- Loss/lack of condition/weight ✓
- Lameness/lethargy ✓
- Diarrhoea/constipation ✓
- Vomiting ✓

(Any 1) (1)

3.6.2 Combined bar graph

**Criteria/rubric/marketing guidelines**

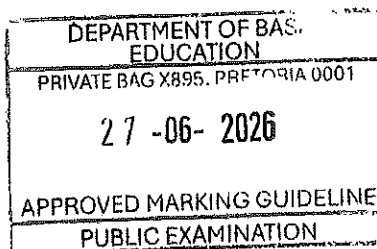
- Correct heading (with both variables) ✓
- X-axis: Correctly calibrated with label (Farm animal) ✓
- Y-axis: Correctly calibrated with label (Annual mortality rates) ✓
- Correct units (%) ✓
- Combined bar graph ✓
- Accuracy (80% + correctly plotted) ✓

(6)

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3.7 Transmission and prevention of animal diseases**3.7.1 Mode of transmission**

- (a) Anthrax - Inhalation/direct contact/ingestion ✓ (1)
- (b) Rift Valley Fever - Vectors ✓ (1)

3.7.2 TWO ways to prevent further spread of diseases once detected

- Vaccination ✓
- Isolation/quarantine ✓
- Controlling vectors ✓
- Proper disposal of carcasses and bedding material ✓
- Notifying the relevant authorities ✓
- Disinfection/sanitation ✓ (Any 2) (2)

3.8 Parasites**3.8.1 Collective term of the organisms**
Parasites ✓ (1)**3.8.2 Identification of the parasites**

- (a) Needs a snail to complete its life cycle - PICTURE A ✓ (1)
- (b) A vector - PICTURE C ✓ (1)

3.8.3 Differentiation of organisms

- PICTURE A: Found inside the body of the host/internally ✓ (1)
- PICTURE C: Found outside the body of the host/externally ✓ (1)

3.9 Salt poisoning**3.9.1 ONE measure to treat salt poisoning**

- Internal provision of fresh water in small quantities through stomach tube ✓
- Treat animals with a hypertonic dextrose or isotonic saline solution ✓
- Immediate removal of the source of salt poisoning ✓ (Any 1) (1)

3.9.2 ONE role of the state in animal protection

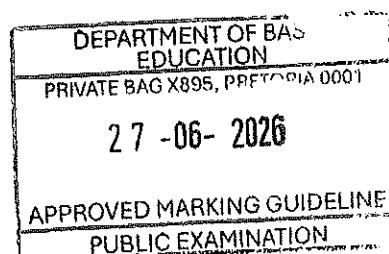
- Public awareness campaigns ✓
- Provision of vaccines ✓
- Provision of veterinary services ✓
- Provision of quarantine services ✓
- Conducts research on animal diseases/pests ✓
- Provides advice, monitoring and control ✓
- Formulates, approves and monitors the implementation of legislation ✓
- Regulates imports/exports ✓ (Any 1) (1)

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QUESTION 4: ANIMAL REPRODUCTION**4.1 Female reproductive system**

4.1.1 **The process represented by A**
Ovulation ✓ (1)

4.1.2 **Justify the answer**
The egg cell is released from the Graafian follicle/ovary ✓ (1)

4.1.3 **Description of the process in B/fertilisation**

- Process when a haploid male gamete/sperm cell and a haploid female gamete/ovum fuse ✓ to form a diploid zygote ✓
- Fusion of male and female gametes ✓ to form diploid zygote ✓ (Any 1) (2)

4.1.4 **Type of cell division by which the zygote divides multiple times**
Mitosis ✓ (1)

4.1.5 **ONE function of the uterus**

- Provides a suitable environment for development of the foetus ✓
- Helps with the transportation of sperm cells ✓
- Helps with the expulsion of the calf ✓
- Provides uterine milk as nutrition to the developing embryo ✓
- Contains nodules where foetal membranes are attached to ✓
- Sperm capacitation ✓ (Any 1) (1)

4.2 Re-arrangement of the mating stages in sequential order

B ✓ (1)

C ✓ (1)

A ✓ (1)

4.3 Hormone concentration during the reproductive cycle in cows

4.3.1 **Identification of the progesterone concentration on day 12**
30 mg/ml ✓ (1)

4.3.2 **Hormones responsible**

- (a) Oestrogen/progesterone ✓ (1)
- (b) Luteinising hormone/LH ✓ (1)

4.3.3 **Description of the change in the progesterone concentration**
Progesterone concentration increase/will become higher ✓ (1)

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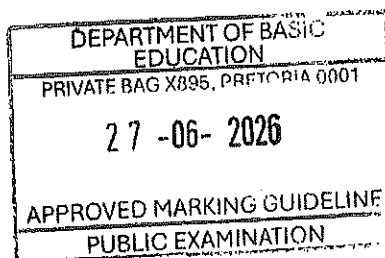
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- 4.3.4 **Identification of the oestrus cycle stage**
Di-oestrus ✓ (1)
- 4.3.5 **The impact of progesterone during di-oestrus**
- Progesterone suppresses the secretion of follicle stimulating hormone (FSH) ✓ to prevent the development of follicles/onset of oestrus ✓
 - Maintains the endometrium ✓ in preparation for implantation ✓
(Any 1) (2)
- 4.4 **Morphological abnormalities in sperm cells**
- 4.4.1 **The morphological abnormalities in sperm cells**
B/C ✓ (1)
- 4.4.2 **Identification of the number of the part responsible for**
- (a) **Mobility** - 3 ✓ (1)
 - (b) **Carrier of the genetic information** - 1 ✓ (1)



- 4.4.3 **Structure releasing the enzyme responsible for sperm penetration**
Acrosome ✓ (1)
- 4.4.4 **The process whereby sperm cells are formed**
Spermatogenesis ✓ (1)
- 4.5 **Reproductive techniques in farm animals**
- 4.5.1 **Identification of the reproductive technique**
Embryo transfer/transplant/ET ✓ (1)
- 4.5.2 **Importance of the recipient cow**
Implantation of the embryos/acts as a surrogate ✓ (1)
- 4.5.3 **Definition of cloning**
Process of generating genetically identical copy of cell/organism ✓✓ (2)
- 4.5.4 **Identification of the sheep**
Nucleus donor sheep ✓ (1)
- 4.5.5 **Justification of the answer**
Genetical material is from somatic cells of the nucleus donor sheep ✓ (1)
- 4.6 **Pregnancy**
- 4.6.1 **Deduction the cow's stage of pregnancy**
Foetal stage ✓ (1)
- 4.6.2 **Description of embryonic stage of pregnancy**
It is the stage after the ovum stage ✓ during which organs, tissues and systems develop ✓ (2)
- 4.6.3 **TWO calf-related possible causes of birth difficulty**
- Abnormal large size foetus/hydropsy ✓
 - Multiple births/twins ✓
 - Incorrect/posterior presentation of the foetus/deviation of the head/flexion of the elbow ✓
 - Hydrocephalus ✓ (Any 2) (2)
- 4.7 **Lactation**
- 4.7.1 **The period of lactation during which milk production declines**
After week 8 to week 9 ✓ (1)
- 4.7.2 **Explanation of the relationship**
Milk production declines while butterfat content increases/
vice versa ✓✓ (2)

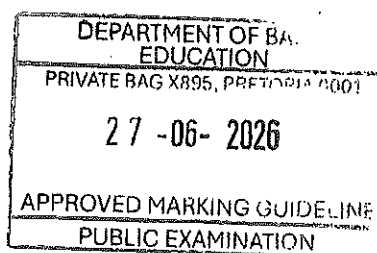
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TOTAL SECTION B: 105
GRAND TOTAL: 150

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