

EXAMINATION		NATIONAL SENIOR CERTIFICATE	
GRADE		12	
DATE		NOVEMBER 2025	
SUBJECT		AGRICULTURAL SCIENCES	
PAPER		1	
MARK TOTAL		150	
DURATION (HOURS)		2½	
NUMBER OF PAGES		16	



SOUTH AFRICAN COMPREHENSIVE ASSESSMENT INSTITUTE
SUID-AFRIKAANSE KOMPREENSIEWE ASSESSERINGSINSTITUUT



INSTRUCTIONS AND INFORMATION

1. This question paper consists of **TWO** sections, namely **SECTION A** and **SECTION B**.
2. Answer **ALL** the answers in the **ANSWER BOOK**.
3. Start the answer to each question at the top of a new page.
4. Number the answers exactly as the questions are numbered.
5. Non-programmable calculators may be used.
6. Show **ALL** calculations, including formulae, where applicable.
7. Write neatly and legibly, in **BLUE** ink only.

SECTION A

QUESTION 1

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

1.1.1 The enzyme in the small intestine of animals which breaks down fat:

- A Lipase
- B Pepsin
- C Amylase
- D Rennin (2)

1.1.2 The first part of the large intestines is called the ...

- A anus.
- B caecum.
- C colon.
- D rectum. (2)

1.1.3 An animal consumed a feed with a dry matter content of 13 kg, and the dry mass of the manure excreted was 4 kg. The coefficient of the digestibility of the feed is:

- A 72%
- B 69%
- C 68%
- D 23% (2)

1.1.4 ... is often used as a reference point for assessing the quality of protein in animal feed because it is a high-quality, complete protein source, containing all essential amino acids in correct proportions.

- A Egg protein
- B Milk protein
- C Soya beans
- D Fish protein (2)



- 1.1.5 An intensive farming practice which involves confinement of many animals in a small, enclosed area and are fed large quantities of concentrates for maximum output production.
- A Backyard farming
 - B Subsistence farming
 - C Feedlot
 - D Free-range system
- (2)
- 1.1.6 The following are reasons for handling of poultry:
- i) Vaccination
 - ii) Feeding
 - iii) Cleaning of houses
 - iv) Weighing
- Choose the correct combinations of reasons below:
- A i), ii) and iv)
 - B i), iii) and iv)
 - C i), ii), iii) and iv)
 - D iii) and iv)
- (2)
- 1.1.7 The medical examination of a dead animal to determine the cause of death.
- A Rigor mortis
 - B Clinical examination
 - C Post-mortem
 - D Pre-examination
- (2)
- 1.1.8 The mammary glands of farm animals are mainly affected by this bacterial disease.
- A Newcastle disease
 - B Mastitis
 - C Babesiosis
 - D Rift Valley fever
- (2)

1.1.9 Progesterone is secreted by the ...

- A corpus luteum.
- B pituitary gland.
- C hypophysis.
- D graafian follicle.

(2)

1.1.10 The period of milk production in a cow is called ...

- A synthesis.
- B letdown.
- C ejection.
- D lactation.

(2)

(10x2) (20)

1.2 In the table below, a description and **TWO** possible answers are given. Indicate whether each of the following descriptions in **COLUMN B** applies to **A ONLY**, **B ONLY**, **BOTH A and B** or **NONE** of the items in **COLUMN A** and write your answer next to the question numbers (1.2.1 to 1.2.5) in the **ANSWER BOOK**.

COLUMN A			COLUMN B
1.2.1	A	Passive absorption	Movement of molecules against concentration gradient.
	B	Active absorption	
1.2.2	A	Lucerne hay	Feed type suitable for production.
	B	Groundnut	
1.2.3	A	Pig	Farm animal with a vision that extends almost 310°.
	B	Cow	
1.2.4	A	Heterothermic	All farm animals.
	B	Coldblooded	
1.2.5	A	Hypoplasia	Congenital defect where the testes are underdeveloped.
	B	Cryptorchidism	

(5x2) (10)



- 1.3 Give the **CORRECT AGRICULTURAL 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**, for example, 1.3.6 Bile.
- 1.3.1 The part of the small intestine where maximum absorption of nutrients mainly occurs.
- 1.3.2 The loss of heat from a warm body to a colder surrounding environment.
- 1.3.3 A single gland that surrounds the urethra which forms a ring.
- 1.3.4 An animal which has both male and female reproductive organs.
- 1.3.5 Removal of a nucleus from a cell for nuclear transfer. (5x2) **(10)**
- 1.4 Change the **UNDERLINED WORD(S)** in **EACH** of the following statements to make them **TRUE**. Write only the appropriate word(s) next to the question numbers (1.4.1 to 1.4.5) in the **ANSWER BOOK**.
- 1.4.1 The fundic sphincter, also known as the lower oesophageal sphincter, prevents stomach content from flowing back to the oesophagus in a pig.
- 1.4.2 The hormone oxytocin is released when the cow experiences stress or fear.
- 1.4.3 The testes are divided partially in the length by a fibrous chord, the vasa differentia.
- 1.4.4 The embryo receives oxygen and nutrients through the navel.
- 1.4.5 Acquired defects are present at birth and develop when the foetus is still inside the uterus. (5x1) **(5)**

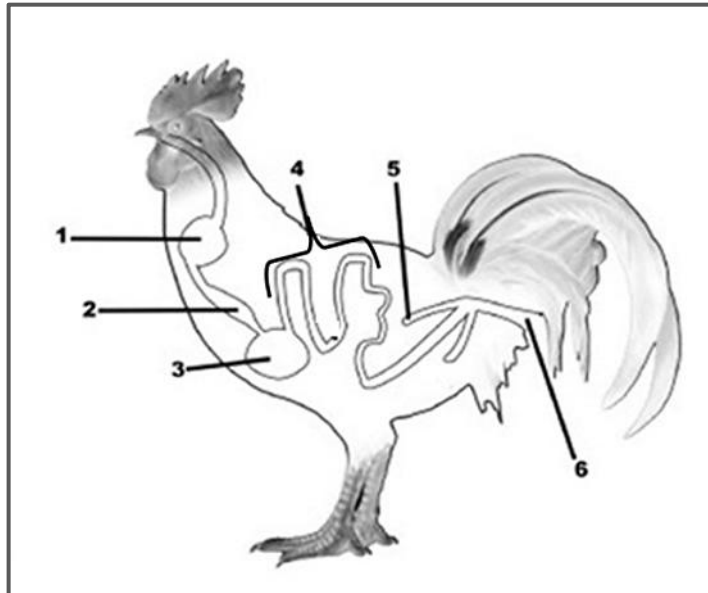
TOTAL SECTION A: [45]

SECTION B

QUESTION 2: ANIMAL NUTRITION

Start this question on a NEW page.

2.1 Answer the questions based on the alimentary canal of a fowl.



[Source: Poultry Science, Volume 102, Issue 10, October 2023, 102844]

2.1.1 Identify the NUMBER and PART of the alimentary canal where the following processes take place.

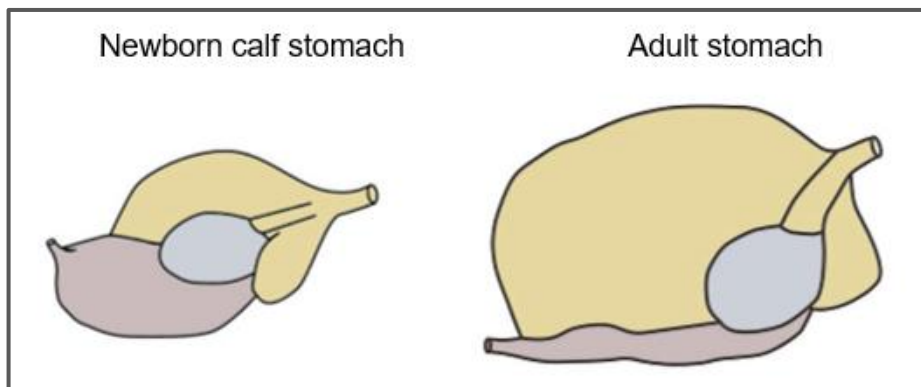
- a) Microbial fermentation (2)
- b) Soaking and storage of food (2)
- c) Secretion of digestive juices (2)

2.1.2 Name part 4 and explain briefly how this part is structurally adapted to perform its function. (4)

2.1.3 Compare the structural differences between poultry and pig alimentary canals to facilitate the digestion of food. (4)



- 2.2 Young calves are not true ruminants when they are born. Answer the questions that follow based on the stomach of a newborn calf and of an adult ruminant.



[Source adapted from: <https://www.sciencedirect.com/science/article/pii/S002203021730958X>]

- 2.2.1 Name the stomach of the calf that is underdeveloped when compared to the stomach of an adult ruminant (1)
- 2.2.2 Explain the pathway milk will follow through the young calf's digestive tract from the oesophagus to small intestine and refer to changes in the milk consistency. (5)
- 2.2.3 The table below indicates the different proportions of the stomach compartments of a calf at different ages and that of an adult ruminant.

Percentage (%) of the total stomach					
	Birth	1 month	2 months	3 months	Adult
Reticulorumen	35	52	62	65	62
Omasum	14	10	15	16	24
Abomasum	51	38	23	19	14

- Draw a bar graph to indicate the differences between the percentage of the total stomach of a calf at birth, 3 months and an adult ruminant. (8)



2.3 The table below shows the composition of three feeds:

	FEED A	FEED B	FEED C
TDN (%)	85	70	72
DP (%)	12	8	15
NR	1: 6	1: 8	_____

- 2.3.1 Calculate the nutritive ratio (NR) of **FEED C**. (3)
- 2.3.2 Recommend a feed (**A**, **B** or **C**) for milk production in a dairy herd. (1)
- 2.3.3 Give a reason for the answer in QUESTION 2.3.2. (1)
- 2.3.4 Evaluate the data in the table above and identify the feed that will be less expensive. (Keep in mind that the protein sources in animal feed are generally the most expensive and limiting ingredients in feed formulations). (1)
- 2.3.5 Justify the answer in QUESTION 2.3.4. (1)

[35]



QUESTION 3: ANIMAL PRODUCTION, PROTECTION AND CONTROL

Start this question on a NEW page.

3.1 The picture below represents a production system in farming.

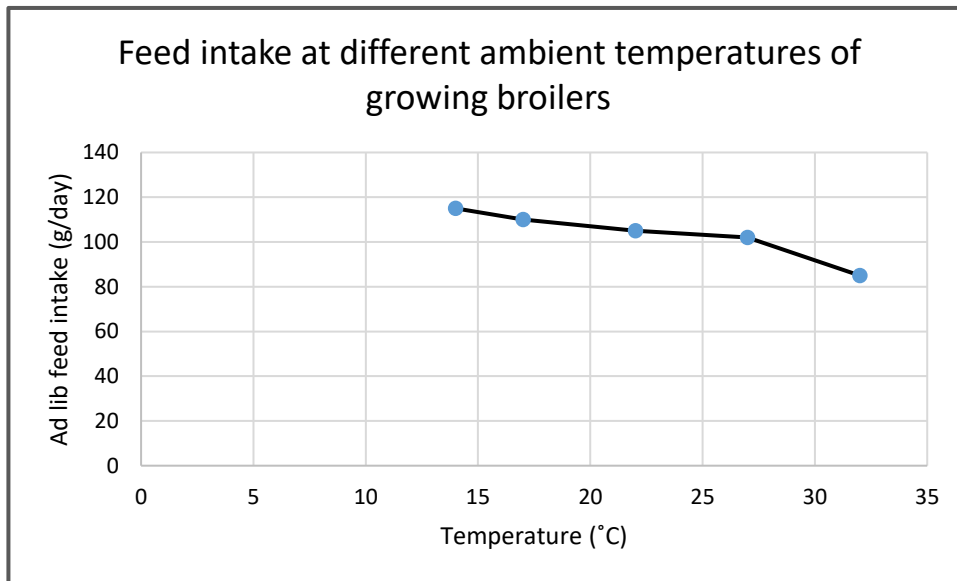


[Source: <https://www.africanfarming.com/2023/09/13/>]

- 3.1.1 Identify the production system that can be associated with the picture above. (1)
- 3.1.2 Justify the answer in QUESTION 3.1.1. (1)
- 3.1.3 Name TWO factors a farmer needs to improve to ensure maximum production in this system. (2)

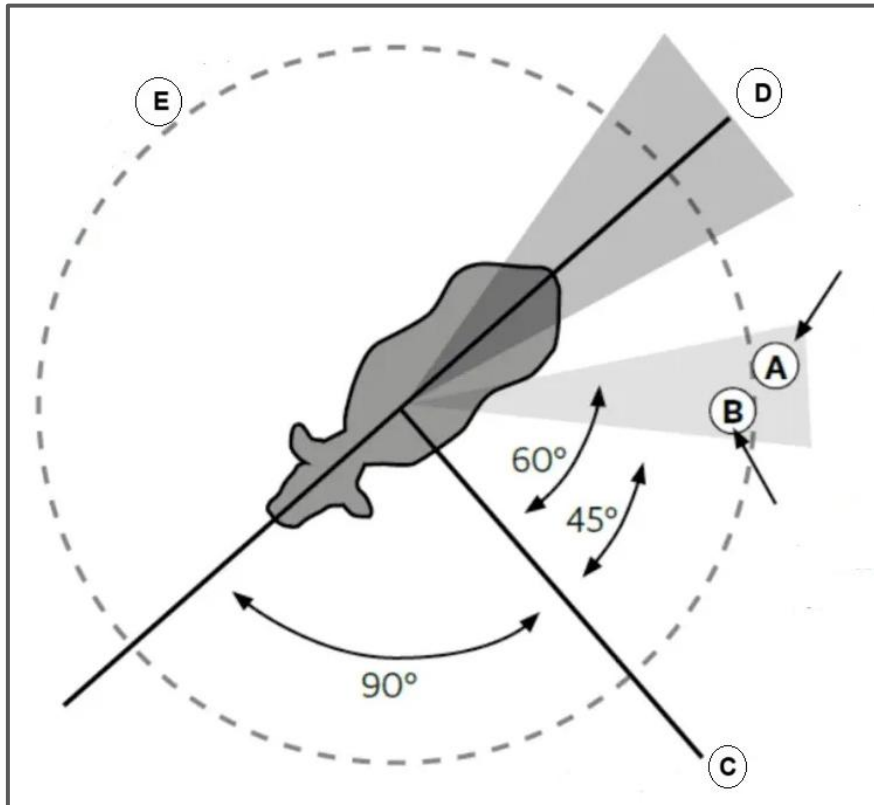


3.2 Analyse the graph of the feed intake of growing broilers at different ambient temperatures.



- 3.2.1 Broiler housing is very important to achieve optimum production. Describe the correlation between high environmental temperatures and feed intake in animals as represented in the graph above. (2)
- 3.2.2 Explain why production is likely to decrease at temperatures lower than 15°C. (2)
- 3.2.3 Deduce the optimum temperature from the graph above to ensure effective feed conversion. (1)

3.3 Below is an overhead diagram of the flight zone of cattle.



- 3.3.1 Define the term *flight zone*. (2)
- 3.3.2 Describe TWO factors that can influence the size of a cow's flight zone. (2)
- 3.3.3 Identify the letter (**A** to **E**) which corresponds with the statement that represents the area or action when handling a large animal. (1)
- a) Handler position to start movement (1)
 - b) Point of balance (1)
 - c) Blind spot (1)
 - d) Edge of flight zone (1)
- 3.3.4 A farmer is trying to move a group of cattle into a pen. Some cattle seem hesitant to move despite the efforts, while others become anxious and scatter. (3)
- Provide THREE recommendations on how the farmer could change the handling of the cattle to minimise stress and move the cattle more effectively.



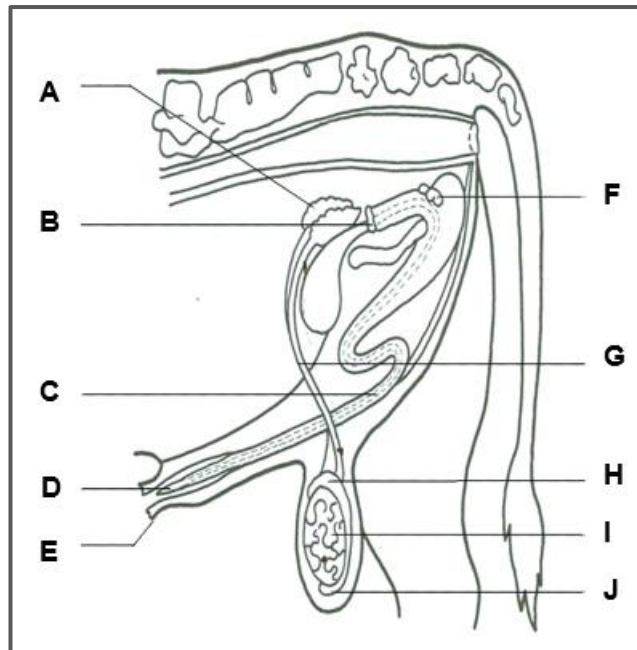
- 3.4 Maintaining the health of the herd on a farm is a very important responsibility of the farmer.
- 3.4.1 List TWO visible symptoms of a sick animal. (2)
- 3.4.2 Explain the importance of isolating a sick animal from the rest of the herd. (2)
- 3.4.3 Define the term *biosecurity*. (2)
- 3.4.4 Describe TWO measures that can be implemented on a farm to improve animal health. (2)
- 3.5 A farmer observed the following symptoms in some of the sheep on the farm like losing weight, having pale gums and appearing weak. Upon examination, the veterinarian diagnosed the problem as a heavy infestation with internal parasites (worms).
- 3.5.1 Name the condition the sheep with pale gums are likely to be suffering from. (1)
- 3.5.2 Suggest TWO preventative measures the farmer could take to reduce the risk of internal parasites in the future. (2)
- 3.5.3 Explain the economic and health implications of failing to control internal parasites in livestock. (4)

[35]

QUESTION 4: ANIMAL REPRODUCTION

Start this question on a NEW page.

4.1 Answer the questions based on the reproductive organs of a bull.



4.1.1 Indicate the LETTER and NAME of the organs responsible for the following:

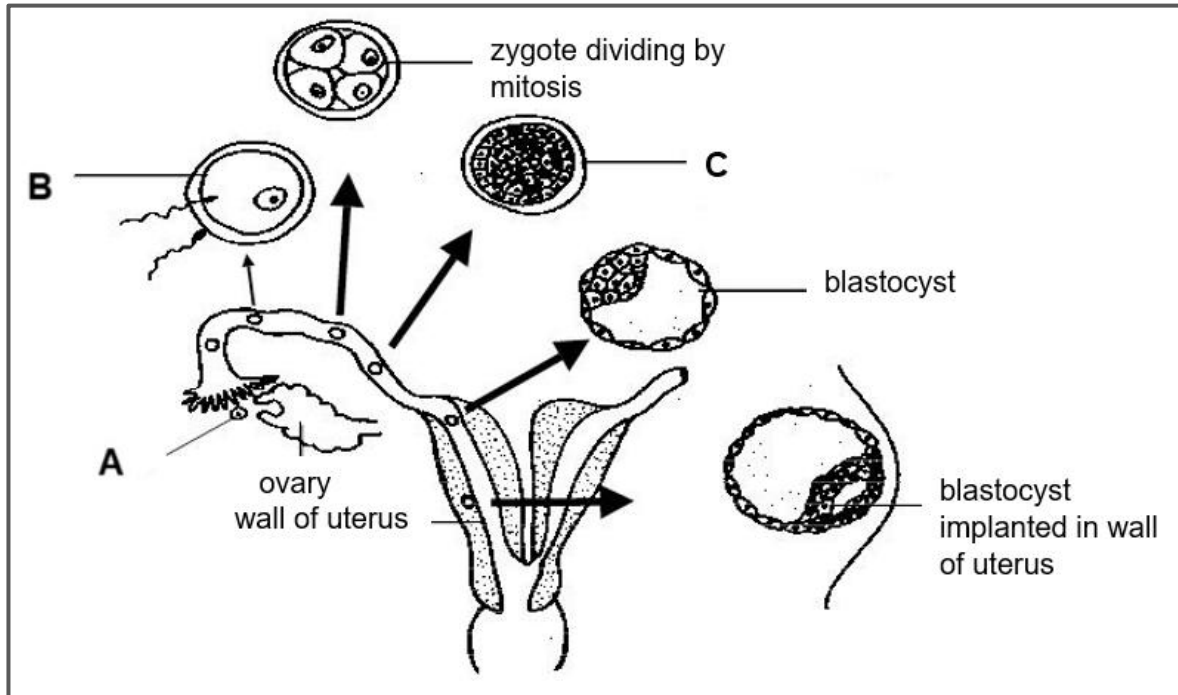
- a) Fluid secreted by this gland transports the spermatozoa. (2)
- b) Sperm cells mature and become fully mobile. (2)
- c) Secretion from this gland improves mobility of the sperm cells. (2)

4.1.2 Name the process that takes place in part I. (1)

4.1.3 Name and explain TWO congenital defects of part I which may cause sterility in bulls. (4)

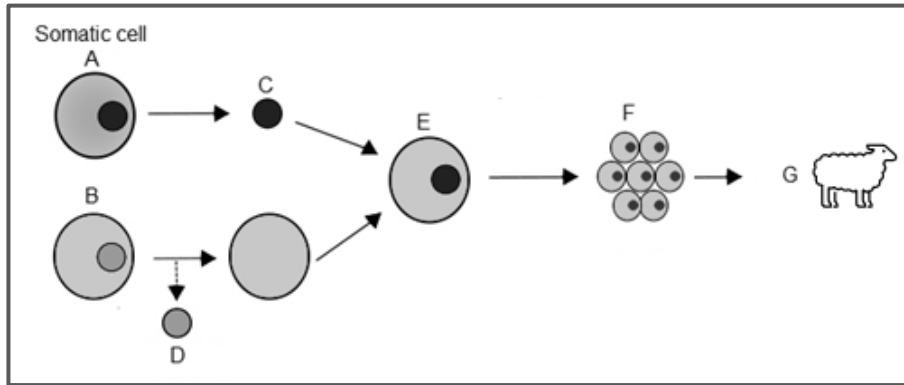


4.2 Analyse the diagram of the reproductive processes in a cow.



- 4.2.1 Identify **A** in the diagram above. (1)
- 4.2.2 Explain the role played by the hormones that are responsible for triggering the release of **A** identified in QUESTION 4.2.1. (3)
- 4.2.3 Identify the process illustrated by **B**. (1)
- 4.2.4 Explain the structure labelled **C**. (2)
- 4.2.5 Indicate THREE influences of progesterone on the process of the blastocyst implanting on the wall of the uterus. (3)

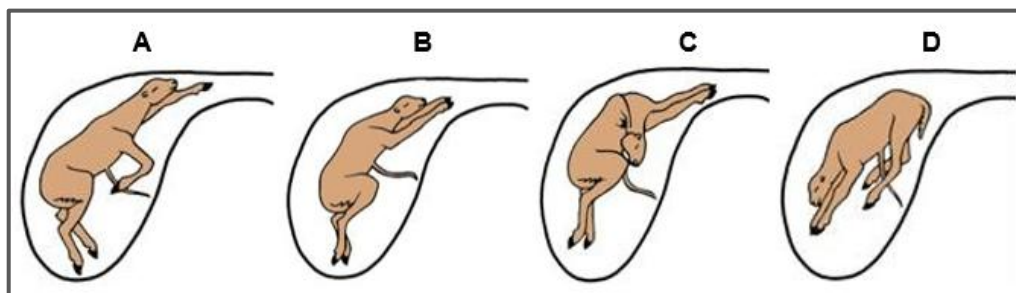
4.3 The diagram below represents a reproductive process.



[Source adapted from: <https://commons.wikimedia.org/wiki/>]

- 4.3.1 Identify the type of reproductive process above. (1)
- 4.3.2 Define the process identified in QUESTION 4.3.1. (2)
- 4.3.3 Supply labels for **B**, **C** and **G** in the diagram above. (3)
- 4.3.4 Give TWO disadvantages of the process identified in QUESTION 4.3.1 when a surrogate is used. (2)

4.4 The pictures below illustrate different presentations of a foetus in the uterus of a cow.



[Source: *Dystocia in Cattle*, Mohammed Essam Sophy, April 4, 2016, <https://www.linkedin.com/pulse/dystocia-cattle-mohammed-essam-sobhy/>]

- 4.4.1 Identify the illustration with the normal birth position of a calf. (1)
- 4.4.2 Explain the normal birth position of a calf as identified in QUESTION 4.4.1. (2)
- 4.4.3 Name the calf position illustrated in **D**. (1)
- 4.4.4 Give TWO indirect causes of the retention of placenta in cows. (2)

[35]

TOTAL SECTION B: [105]

GRAND TOTAL: [150]