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NATIONAL SENIOR CERTIFICATE

GRADE 12

SEPTEMBER 2025

AGRICULTURAL SCIENCES P1

MARKS: 150

TIME: 2½ hours



This question paper consists of 18 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.



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 stomach of a fowl in which enzymatic digestion of food takes place.

- A Proventriculus
- B Ventriculus
- C Gullet
- D Gizzard

1.1.2 In a digestibility trial, a cow excreted 35 kg of manure with a moisture content of 55%. The dry material content of the manure is ... kg.

- A 19,25
- B 16
- C 15,75
- D 5,75

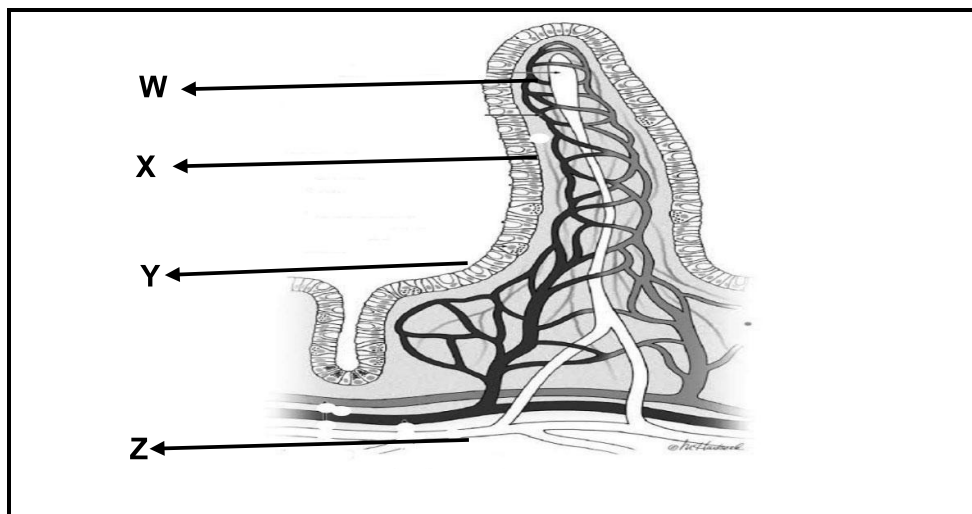
1.1.3 The following is true about digestion in the stomach:

- (i) Pancreatic juice neutralises acidic chyme
- (ii) Pepsin breaks down proteins into peptides
- (iii) Rennin converts soluble caseinogen into insoluble casein
- (iv) Inactive pepsinogen is changed into active pepsin.

Choose the CORRECT combination:

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

- 1.1.4 Part ... transports digested fats and fat soluble vitamins into the lymphatic system.



- A X
B W
C Z
D Y

- 1.1.5 Animal housing and shelter plays a vital role in protecting animals against ...

- (i) extreme heat.
(ii) severe cold.
(iii) proper breeding.
(iv) wetting by rain.

Choose the CORRECT combination:

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

1.1.6 The picture below shows the ... layer housing system.



- A feed lot
- B battery cage
- C deep litter
- D floor system

1.1.7 A wide-spread occurrence of an infectious disease that spreads rapidly through an area.

- A Pandemic
- B Rabies
- C Endemic
- D Epidemic

1.1.8 Sequential stages in the development of a liver fluke parasite.

- A Egg → miracidium → cercaria → adult fluke
- B Miracidium → egg → cercaria → adult fluke
- C Cercaria → miracidium → egg → adult fluke
- D Egg → cercaria → miracidium → adult fluke

1.1.9 A single, narrow, coiled tube that transports sperm from the testes to the vas deferens.

- A Epididymis
- B Prostate
- C Semi vesicle
- D Penis

1.1.10 ... retains and nourishes the embryo and the foetus during gestation.

- A Ovary
- B Uterus
- C Oviduct
- D Vagina

(10 x 2) (20)

- 1.2 Indicate whether the descriptions in COLUMN B applies to **A ONLY**, **B ONLY**, **B, 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 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:	Pancreas	Digestive gland that secretes the enzyme amylase.
	B:	Salivary gland	
1.2.2	A:	Vitamin B ₁₂	Water soluble vitamin
	B:	Vitamin A	
1.2.3	A:	Crush	Used for handling pigs
	B:	Plywood board	
1.2.4	A:	Non infectious	Disease caused by severe and sudden changes in fluids, electrolytes and soluble organic elements.
	B:	Metabolic	
1.2.5	A:	Anterior	Correct foetal presentation during parturition
	B:	Posterior	

(5 x 2) (10)

- 1.3 Give ONE word/term 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 The actual energy available for maintenance and production purposes

1.3.2 Microscopic vector causing a contagious disease called mange

1.3.3 A device strapped around the cow's lower leg to detect and record motion

1.3.4 An infertile cow with masculinised behaviour and non-functioning ovaries

1.3.5 The first milk released after calving (5 x 2) (10)

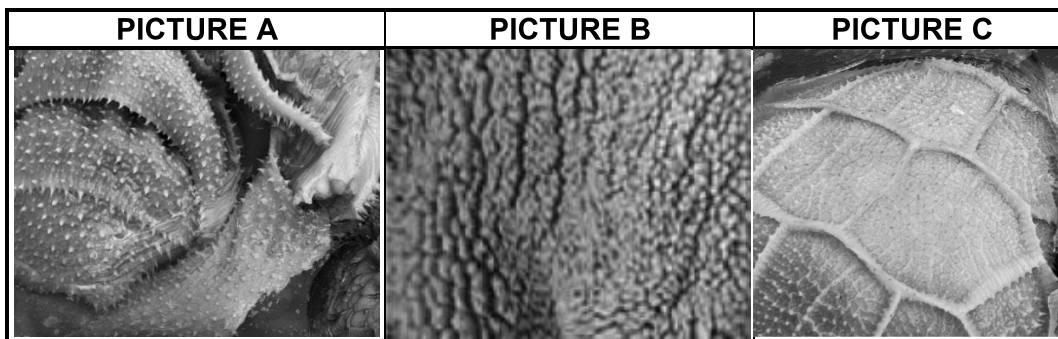
- 1.4 Change the UNDERLINED WORD(S) in each of the following statements to make them TRUE. Write only the answer next to the question number in the ANSWER BOOK.
- 1.4.1 Hormones increase the palatability and digestibility of feeds.
- 1.4.2 Subsistence farming uses modern technology to maximize profits.
- 1.4.3 Mastitis is the inflammation of the uterus that occurs in the post-partum period.
- 1.4.4 Hydrocephalus is a condition of prolonged and difficult parturition.
- 1.4.5 Fertility is the permanent inability of an animal to reproduce. (5 x 1) (5)

TOTAL SECTION A: 45

SECTION B**QUESTION 2: ANIMAL NUTRITION**

Start this question on a NEW page.

2.1 The pictures below show the internal structure of a farm animal's stomachs.



2.1.1 Classify the animal with stomach compartments above based on its alimentary canal. (1)

2.1.2 Mention the collective name for the stomachs above. (1)

2.1.3 Identify from the stomachs above where each of the following takes place. Write only the LETTER.

(a) Absorption of water and electrolytes. (1)

(b) Foreign objects lodge here. (1)

(c) Microbial fermentation of the ingested feed takes place here. (1)

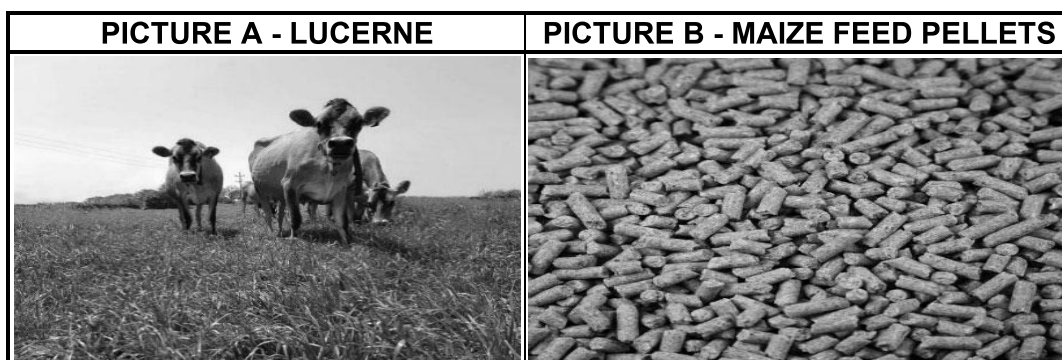
2.1.4 Name of the true stomach in each of the following animals:

(a) Goats (1)

(b) Poultry (1)

2.1.5 Give a reason why these stomachs are regarded as true stomachs. (1)

2.2 The pictures below show different types of feeds.



2.2.1 Classify the feeds above. (2)

2.2.2 Identify a feed (**A** or **B**) that will be appropriate under the following:

- (a) Main feed for dairy cattle (1)
- (b) Results in less feed wastage (1)
- (c) Ideal for fattening animals (1)

2.3 To maximise production, the farmer must provide farm animals with optimum nutrition throughout the production cycle. Balancing rations is the most proper way thereof. A farmer wishes to produce a ration with 15% Crude Protein using the following feeds.

FEEDS	% CRUDE PROTEIN	PRICE OF FEEDS (R/T)
Maize meal	18	3 500
Sunflower Oil Cake Meal	49	6 050

2.3.1 Name the method used by farmers to balance rations. (1)

2.3.2 Calculate the ratio in which the feeds can be mixed to meet the protein requirements. (4)

2.3.3 Calculate the cost of maize in 1 ton of the ration in QUESTION 2.3.2. (4)

2.4 The table below shows two feeds that were used in cattle feeding program.

FEED	% TOTAL DIGESTIBLE NUTRIENT (TDN)	% DIGESTIBLE PROTEIN (DP)	NUTRITIVE RATIO (NR)
A	81	6	1:10
B	78	13	—

2.4.1 Calculate the nutritive ratio (NR) for feed **B**. (3)

2.4.2 Deduce the feed type that will be most suitable to raise heifers based on its NR. (1)

2.4.3 Justify the answer in QUESTION 2.4.2. (3)

- 2.5 Match the following feed supplements with the descriptions in QUESTION 2.5.1 to 2.5.3.

Vitamins; growth stimulants; synthetic amino acids; minerals; non-protein nitrogen (NPN)

- 2.5.1 Thyroid regulators are an example. (1)
- 2.5.2 Intake is controlled by salt concentration. (1)
- 2.5.3 Essential inorganic elements. (1)
- 2.6 Biological value (BV) is a measure of the quality of a protein in a feed.
- 2.6.1 Name an ideal protein with a BV of 100. (1)
- 2.6.2 Explain why it is not necessary to feed ruminants with feeds of high BV. (2)

[35]

QUESTION 3: ANIMAL PRODUCTION, PROTECTION AND CONTROL

Start this question on a NEW page.

3.1 The pictures below show examples of different production systems.



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

3.1.2 Compare the production systems **A** and **B** above in terms of:

- (a) Labour (2)
- (b) Output (2)

3.1.3 Mention TWO examples of equipment that can be used to control environmental conditions of animals in PICTURE **A**. (2)

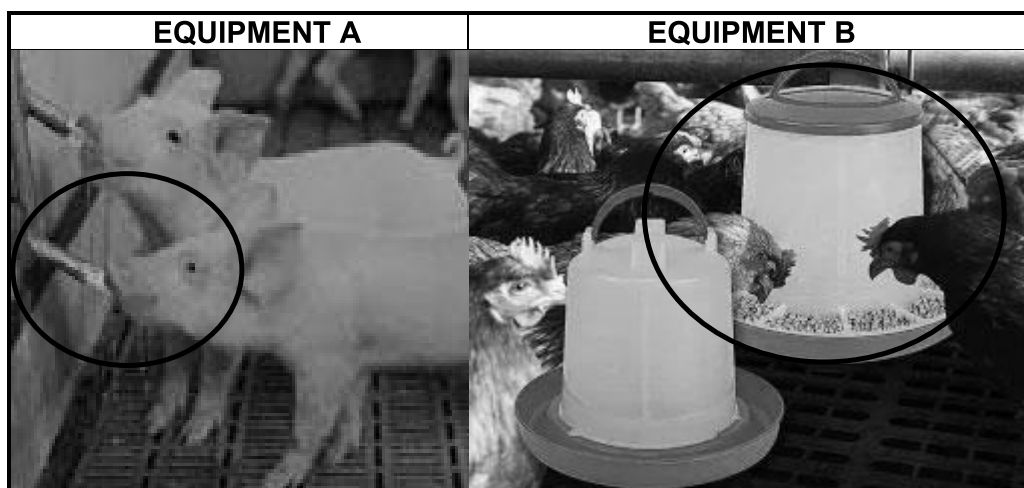
3.2 The picture below shows a structure used to shelter farm animals.



3.2.1 Identify the structure in the picture above. (1)

3.2.2 Briefly explain TWO requirements that should be met by the shelter shown above. (2)

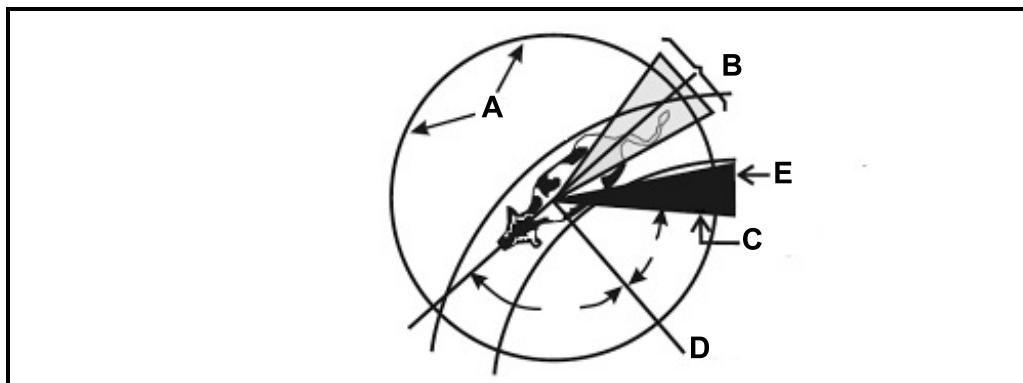
3.3 The pictures below show equipment used in animal production.



3.3.1 Identify the equipment encircled in pictures **A** and **B** above. (2)

3.3.2 Name the type of lighting that is essential for keeping the newborns of the animals above warm. (1)

3.4 The diagram below illustrates an important aspect in animal behaviour.



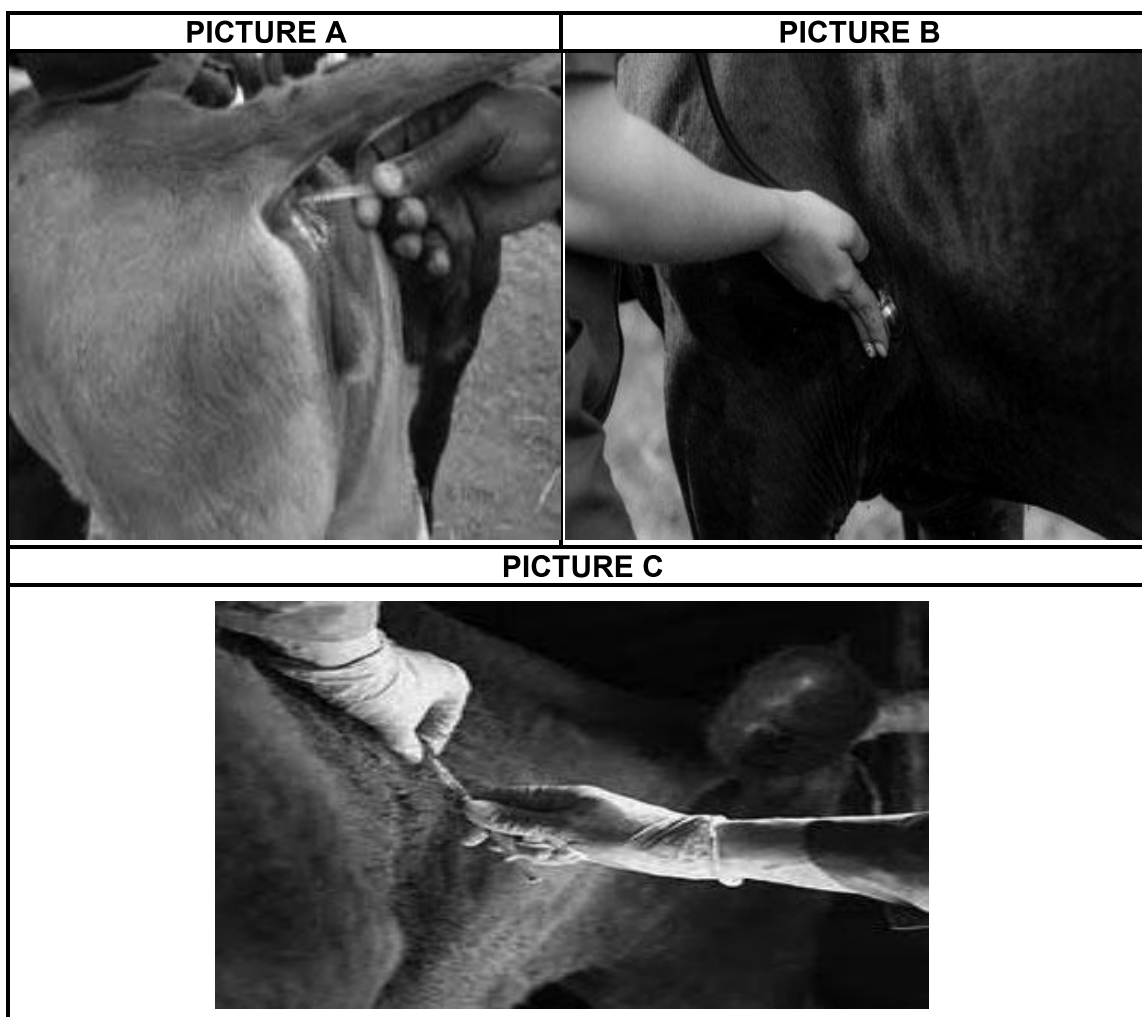
3.4.1 Identify the points labelled **A** and **B**. (2)

3.4.2 Indicate the letter showing the point of balance. (1)

3.4.3 Indicate TWO consequences of approaching an animal from direction **B** in the diagram above. (2)

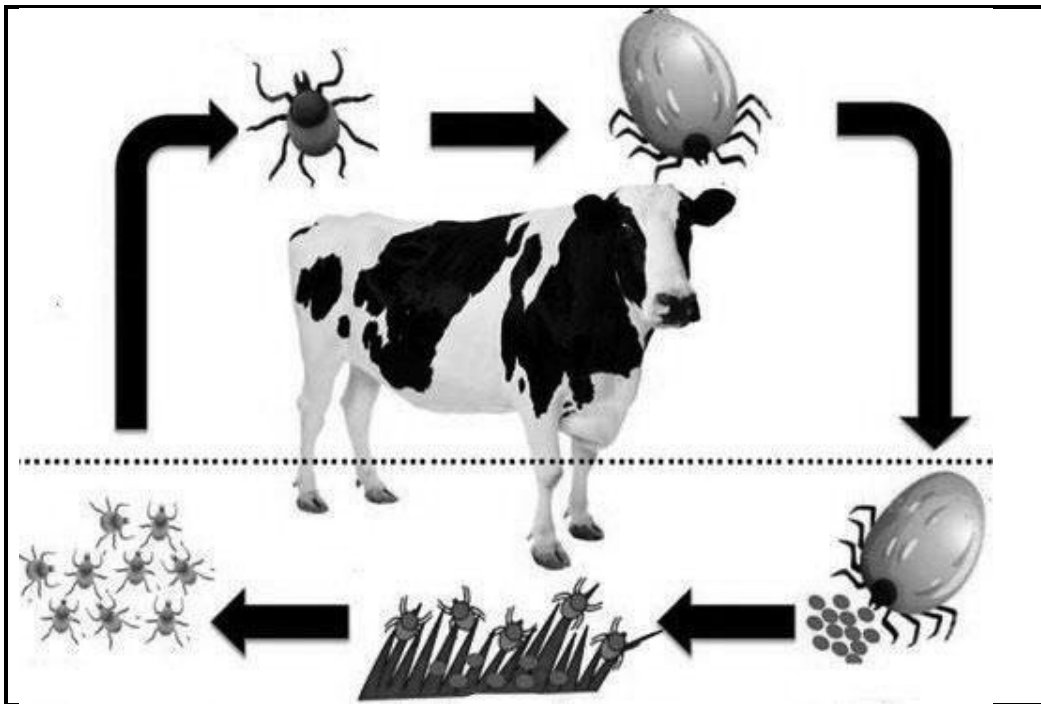
3.4.4 Mention ONE abnormal behaviour shown by pigs when under stress. (1)

- 3.5 Pictures **A** and **B** show different methods of testing the health of animals, while picture **C** shows a method of administering medication.



- 3.5.1 Identify the methods of testing animal health in PICTURES **A** and **B**. (2)
- 3.5.2 Indicate the method of administering medication in PICTURE **C**. (1)
- 3.5.3 Mention TWO other methods of medicine administration. (2)
- 3.5.4 Distinguish between *chronic* and *per acute* levels of seriousness of animal diseases. (2)

3.6 The picture below shows an animal infested by a parasite.



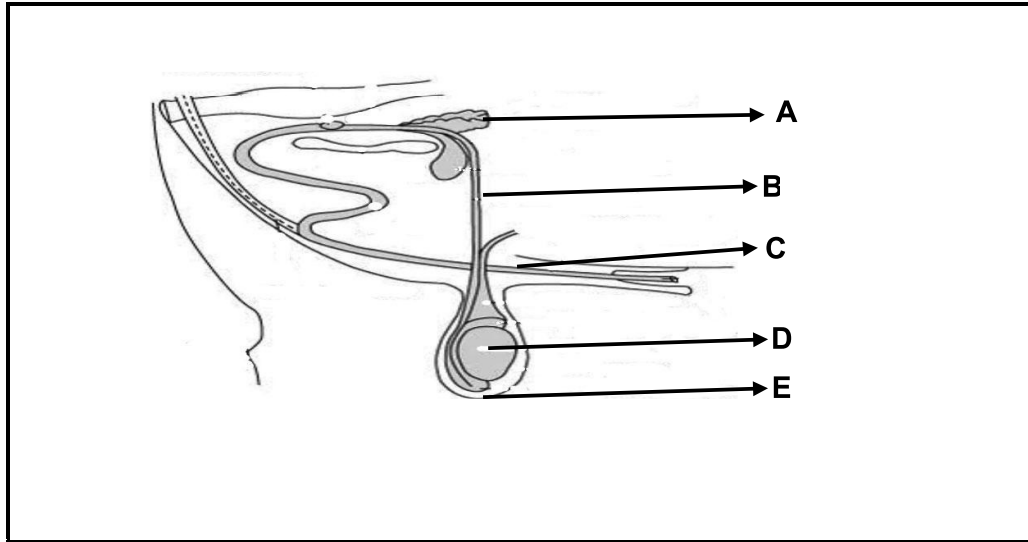
- 3.6.1 Classify the disease the animal above is likely to contract due to infestation by the parasite above. (1)
- 3.6.2 Identify the disease caused by the infestation in the picture above. (1)
- 3.6.3 Indicate TWO symptoms displayed by an animal infected by the disease mentioned in QUESTION 3.6.2. (2)
- 3.6.4 Explain TWO the economic implications of animal diseases. (2)
- 3.6.5 Describe TWO preventative measures for animal diseases like the one in QUESTION 3.6.2. (2)

[35]

QUESTION 4: ANIMAL REPRODUCTION

Start this question on a NEW page.

4.1 The diagram below shows the reproductive organs of a bull.



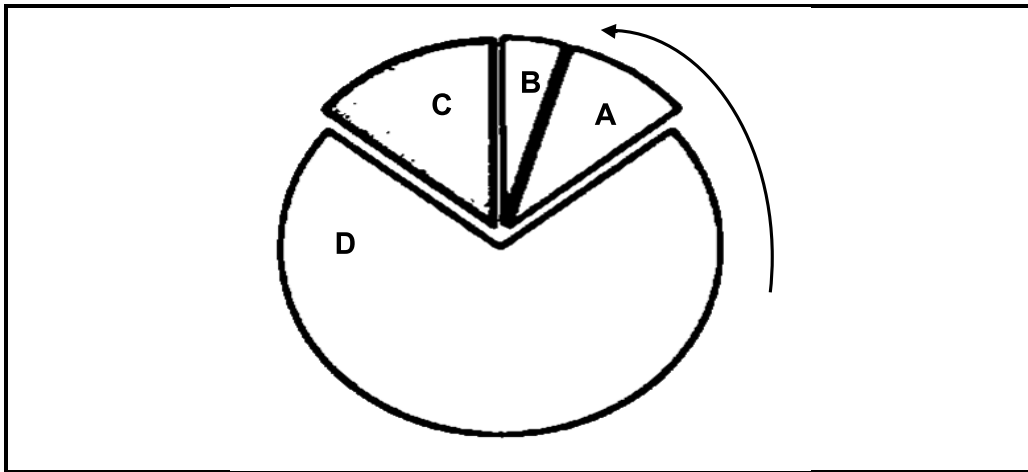
4.1.1 Identify the parts labelled **C**, **D** and **E** in the diagram above. (3)

4.1.2 Indicate by writing only a LETTER where the following occurs.

- (a) Nourishes the sperm cells (1)
- (b) Regulates the temperature of a primary reproductive organ in the male animal (1)
- (c) Contracts powerfully during ejaculation. (1)

4.1.3 Identify a congenital defect that affects part **D**. (1)

4.2 The diagram below shows various stages of the oestrus cycle.



4.2.1 Identify the stages **B** and **D** shown in the diagram above. (2)

4.2.2 Motivate your answers to QUESTION 4.2.1 above. (2)

4.2.3 Describe TWO behavioural signs of oestrus. (2)

4.2.4 Identify a stage associated with each of the following by giving only the letter.

(a) Rapid development of follicles (1)

(b) Fully developed corpus luteum (1)

4.3 Analyse the picture and answer the questions below.



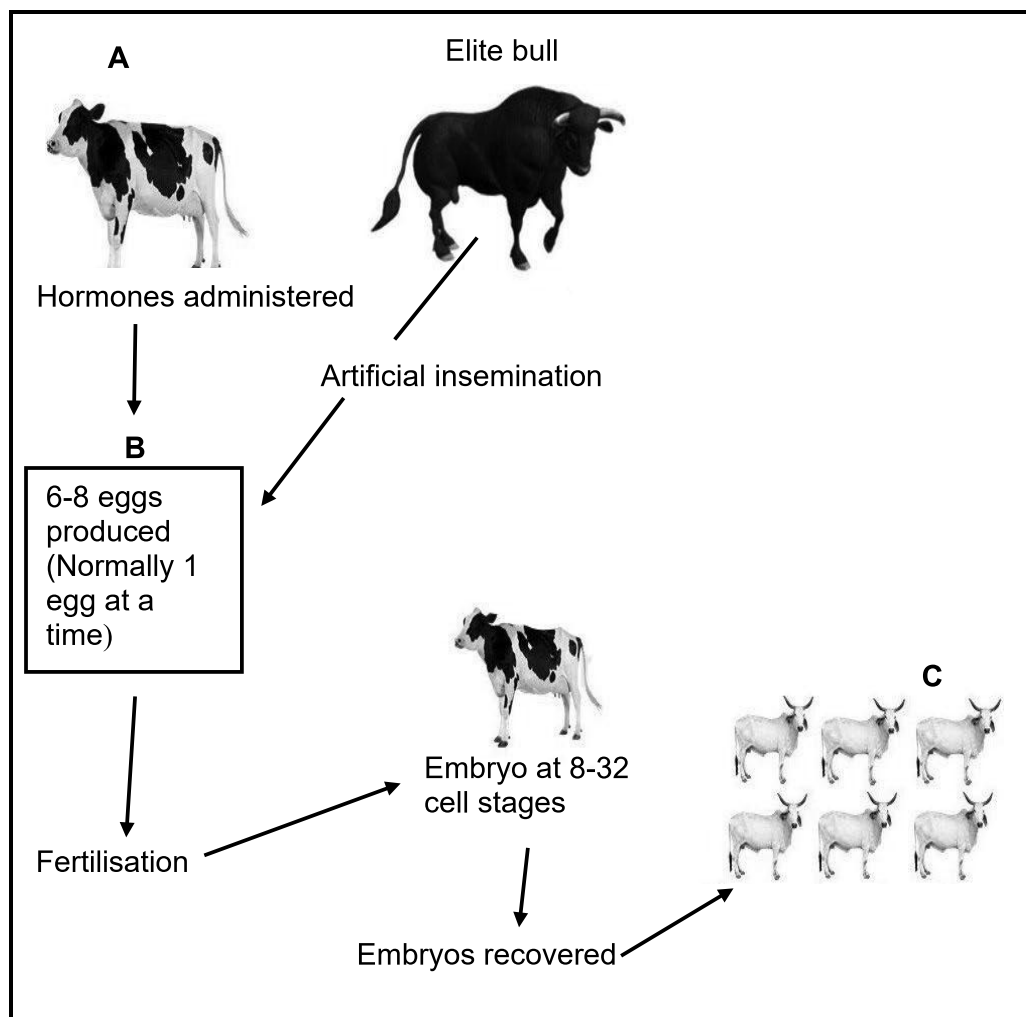
4.3.1 Identify the procedure in the picture above. (1)

4.3.2 Name the tool used to perform this procedure. (1)

4.3.3 Indicate TWO requirements for the process above to be successful. (2)

4.3.4 Identify the best time to inseminate cows. (2)

4.4 The diagram below shows a reproduction procedure in farm animals.



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

4.4.2 Identify the animals in labels **A** and **C**. (2)

4.4.3 Indicate the process taking place in **B**. (1)

4.4.4 Describe TWO reasons to justify the use of the process above by farmers. (2)

- 4.5 The table below shows cow's milk yield and milk butterfat content over a 40-week lactation period.

WEEKS	MILK YIELD (LITRES)	MILK BUTTER FAT CONTENT (%)
1	30	5
10	30	10
20	20	20
30	10	30
40	5	30

- 4.5.1 Present the information on the table in a line graph. (6)

- 4.5.2 Explain the relationship between milk production and butter fat content. (2)
[35]

TOTAL SECTION B: 105
GRAND TOTAL: 150