Province of the
EASTERN CAPE
EDUCATION

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Provinsie van die Oos Kaap: Department van Onderwys
Porafensie Ya Kapa Botjahabela: Lefapha la Thuto

NATIONAL SENIOR CERTIFICATE

GRADE 12

JUNE 2026

AGRICULTURAL SCIENCES

MARKS: **150**

TIME: **2½ hours**

This question paper consists of 14 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. 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 Ruminant stomach that carries out enzymatic digestion.

A Abomasum
B Reticulum
C Omasum
D Rumen

1.1.2 … is an example of a protein rich roughage.

A Maize stalk
B Soya bean oilcake meal
C Oat meal
D Lucerne

1.1.3 The following are functions of rumen microbes:

(i) Hydrolysis of proteins
(ii) Synthesis of vitamins A and D
(iii) Digestion of cellulose
(iv) Synthesis of amino acids

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 A growth stimulant that improves growth by controlling the animal's metabolism.

A Antibiotic
B Tranquiliser
C Thyroid regulator
D Hormone

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1.1.5 Sustainable use of medication entails:

(i) Preventing diseases through vaccination
(ii) Checking the expiry date of the medication prior to its use
(iii) Using higher dosages than specified on the label to eradicate the pathogen quicker
(iv) Only using medication when necessary

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 A … is an ideal tool for administering pills to cattle.

A balling gun
B dosing gun
C drenching gun
D trocar and cannula

1.1.7 The following are advantages of the battery cage system, except:

A Reduces feed wastage
B High egg production rate
C Birds keep healthy as a result of having ample exercise and exposure to sunshine
D Easy to control temperature and humidity

1.1.8 To maintain liver function in a case of poisonous plant intake, animals are given …

A tannic acid.
B strong tea.
C glucose.
D a purgative.

1.1.9 The … of udders is responsible for milk secretion.

A teat cistern
B alveoli
C milk tube
D gland cistern

1.1.10 … is a semen dilutant component that regulates the pH.

A Buffer
B Egg yolk
C Antibiotics
D Glycerol (10 x 2) (20)

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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 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:	Repair worn out tissues	Function of proteins in animals
	B:	Reserve energy source	
1.2.2	A:	Anus	Serves as an opening for both the digestive and uro-genital systems
	B:	Cloaca	
1.2.3	A:	Bont tick	An example of a single host tick
	B:	Blue tick	
1.2.4	A:	Crutching	Chemical control of sheep blowflies
	B:	Tail docking	
1.2.5	A:	Amniotic fluid	Fluid that provides a protective liquid cushion for the embryo
	B:	Allantoic fluid	

(5 x 2) (10)

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 The process of returning partially fermented food from the reticulum/rumen back to the mouth for re-chewing and re-salivation

1.3.2 A bacterial disease that causes bloody discharge from the nose, mouth or anus

1.3.3 A sterile heifer born as a twin to a male, whose development is affected by shared blood supply in the womb

1.3.4 A technique in biotechnology that involves removing the nucleus from a donor cell and injecting into an enucleated oocyte

1.3.5 The fusion of female and male gametes to form a diploid zygote

(5 x 2) (10)

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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 Ingestion is the incorporation or conversion of nutrients into protoplasm.

1.4.2 Commercial farming occurs when farmers grow crops on small holdings to meet the needs of their family.

1.4.3 A pedometer is a heat detection aid that is strapped under the bull's chin.

1.4.4 The release of semen during mating is called copulation.

1.4.5 Adrenaline is a hormone that stimulates the udders to release milk.

(5 x 1) (5)

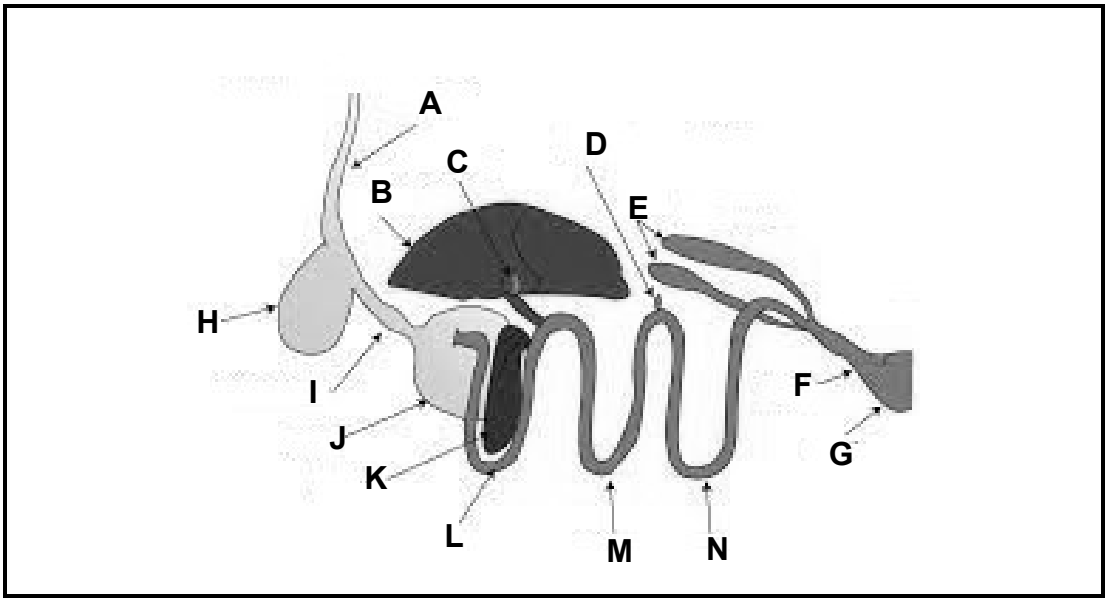
TOTAL SECTION A: 45

SECTION B

QUESTION 2: ANIMAL NUTRITION

Start this question on a NEW page.

2.1 The diagram below shows the alimentary canal of a farm animal.



2.1.1 Name an animal with the alimentary canal above. (1)

2.1.2 Identify the parts labelled **I** and **E** in the diagram. (2)

2.1.3 Identify the parts where each of the following occurs. Give ONLY the letter:

(a) Secretes bile (1)

(b) Fermentation of fibre (1)

2.1.4 Describe TWO adaptations of part **J**, that allows it to perform its function optimally. (2)

2.2 The table below shows the nutritive ratios of two feeds.

FEED A	1 : 4
FEED B	1 : 9

2.2.1 Identify the most expensive of the two feeds. (1)

2.2.2 Identify the feed component represented by value 1 on a nutritive ratio. (1)

2.2.3 Identify the feed that is ideal for feeding a lactating cow. (1)

2.2.4 Motivate your answer to QUESTION 2.2.3 above. (2)

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2.3 A farmer wants to make a ration with 16% digestible protein. The farmer has groundnut oil-cake meal (39% DP) and maize (12% DP).

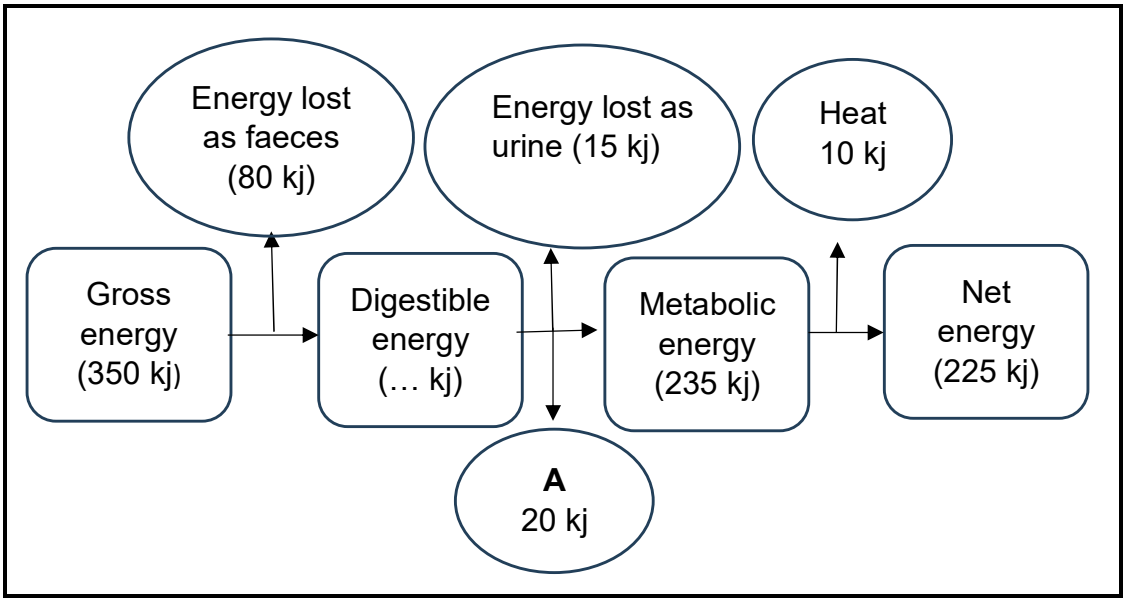
Using a Pearson square, determine the ratio at which the two feeds should be mixed, to achieve the desired DP. (4)

2.4 The table below shows some vitamins/minerals and their deficiency symptoms.

VITAMIN/MINERAL	DEFICIENCY SYMPTOM
Iodine	**A**
B	Polyneuritis
Zinc	**C**
D	Muscular dystrophy

Complete the table above by writing down ONLY the missing information for **A**, **B**, **C** and **D**. (4)

2.5 The schematic diagram below shows the energy flow in feeds.



2.5.1 Deduce the potential energy of the feed. (1)

2.5.2 Identify the energy loss represented by **A** in the diagram. (1)

2.5.3 Using the formula, calculate the digestible energy of the feed in the schematic diagram above. Show ALL calculations. (3)

2.5.4 Give TWO uses of the results from the calculation in QUESTION 2.5.3. (2)

2.6 In a digestibility trial, a ruminant was given 18 kg of hay made of 89% dry matter and it excreted 6 kg of manure made up of 60% moisture.

2.6.1 Calculate the digestibility coefficient of the feed used in the trial above. Show ALL calculations. (6)

2.6.2 Describe the implication of the value obtained in QUESTION 2.6.1. (2)

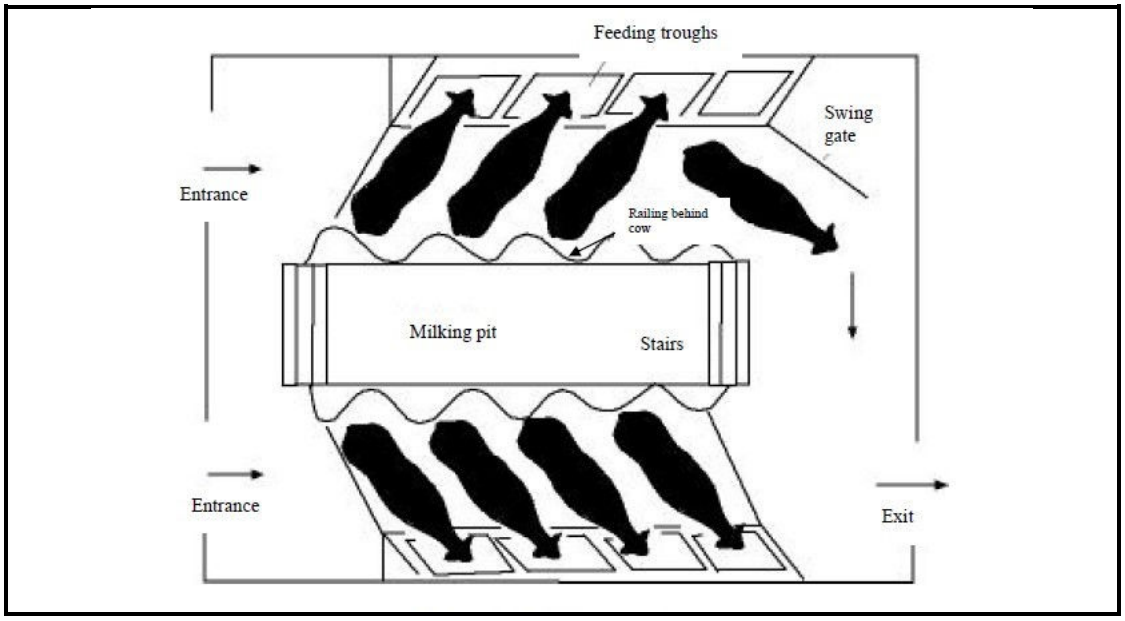
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QUESTION 3: ANIMAL PRODUCTION, PROTECTION AND CONTROL

Start this question on a NEW page.

3.1 The diagram below shows an example of an animal housing system.



3.1.1 Identify the housing system in the diagram above. (1)

3.1.2 Deduce the production system that is associated with housing system above. Justify your choice. (2)

3.1.3 Describe TWO guidelines that should be followed when handling animals in the facility above. (2)

3.1.4 Identify from the diagram, TWO factors that optimise production. (2)

3.2 Livestock primarily lose body heat to their environment through five key mechanisms: evaporation, convection, conduction, radiation, and excretion.

3.2.1 Identify a heat loss mechanism in the passage that associated with each of the following statements:

(a) Emission of heat to cooler surroundings (1)

(b) Contact with cooler surfaces (1)

3.2.2 Indicate TWO ways of keeping pigs cool under intensive farming. (2)

3.2.3 Explain the effect of excessive heat loss on animal production. (2)

3.3 In animal production animals are handled for various reasons.

3.3.1 Give TWO reasons for handling animals. (2)

3.3.2 Describe TWO consequences of improper animal handling. (2)

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3.4 The picture below shows a sick animal.



3.4.1 Identify TWO signs of a sick animal, visible in the picture above. (2)

3.4.2 Suggest TWO methods the farmer can use to test an animal's health. (2)

3.5

South Africans saw egg prices skyrocket in 2023 due to the avian influenza outbreak. According to the World Organisation for Animal Health (WOAH), highly pathogenic avian influenza (HPAI), also known as bird flu, is a contagious viral disease that affects both domestic and wild birds. "Where outbreaks occur in domestic birds, it is often the policy to cull all poultry, whether infected or healthy, to contain the spread of avian influenza."

[Extracted from *The Citizen*]

3.5.1 Identify a word in the extract that describes avian influenza as easily spreading from one organism to another. (1)

3.5.2 Indicate TWO symptoms of avian flu described in the extract. (2)

3.5.3 Give THREE examples of other viral diseases. (3)

3.5.4 Identify TWO economic impacts of animal diseases that are mentioned in the extract. (2)

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3.6 Urea poisoning in cattle happens when they consume too much non-protein nitrogen (NPN) too quickly, overwhelming the rumen microbes and causing a toxic build-up of ammonia in the bloodstream.

3.6.1 Give TWO symptoms of urea poisoning. (2)

3.6.2 Suggest TWO measures farmers can take to avoid urea poisoning in farm animals. (2)

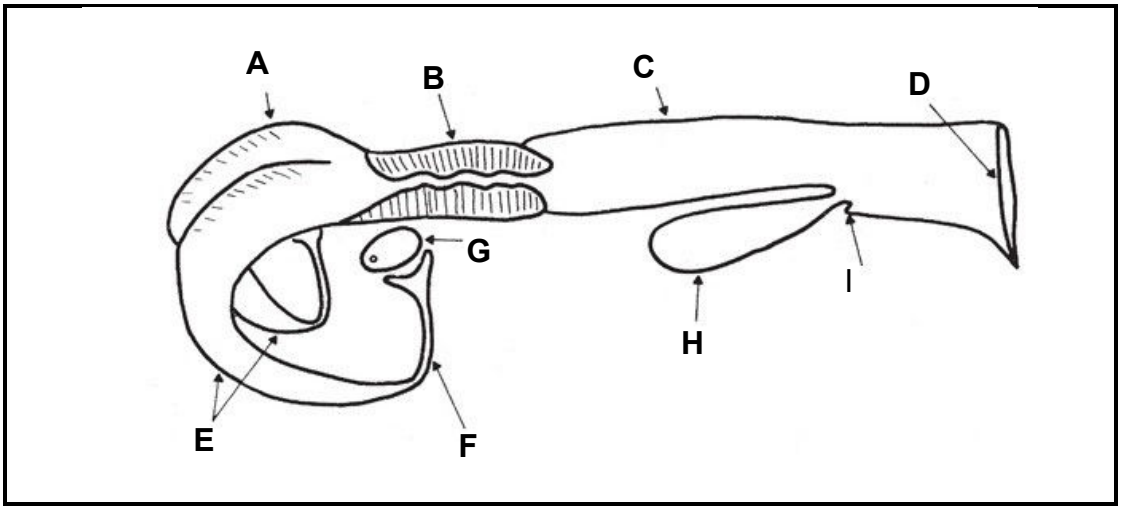
3.6.3 Indicate TWO roles of the state in animal protection. (2)

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QUESTION 4: ANIMAL REPRODUCTION

Start this question on a NEW page.

4.1 The diagram below shows the reproductive system of a cow.



4.1.1 Label the following organs:

(a) **B** (1)

(b) **G** (1)

(c) **C** (1)

4.1.2 Give TWO functions of organ **B**. (2)

4.1.3 Describe TWO ways in which reproduction will be affected if part **G** is removed. (2)

4.2 Embryo transfer (ET) is an advanced reproductive technique used to rapidly multiply superior genetics by collecting embryos from high-value donor cows and transferring them into synchronised, lower-value recipient cows.

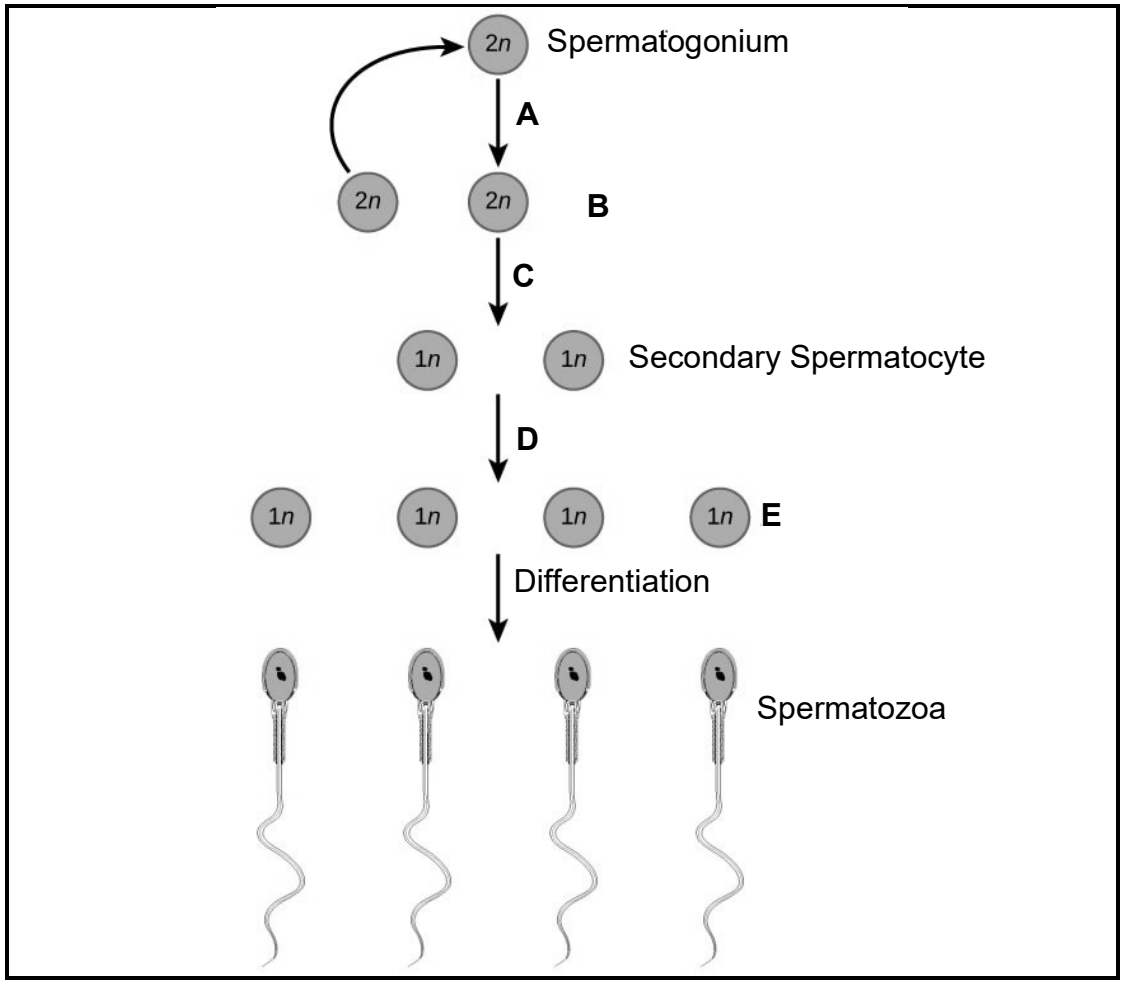
4.2.1 Identify ONE advantage of embryo transfer that is mentioned in the passage above. (1)

4.2.2 Define the concept underlined in the passage. (2)

4.2.3 Name the first TWO stages of the process described in the passage above. (2)

4.2.4 List TWO disadvantages of embryo transfer. (2)

4.3 The diagram below shows a process that takes place in bulls.



4.3.1 Identify the process shown in the diagram above. (1)

4.3.2 Identify the stages **B** and **E** of the process above. (2)

4.3.3 Name a hormone that stimulates the process in the diagram above. (1)

4.3.4 Deduce the type of cell division at **A**. Justify your choice. (2)

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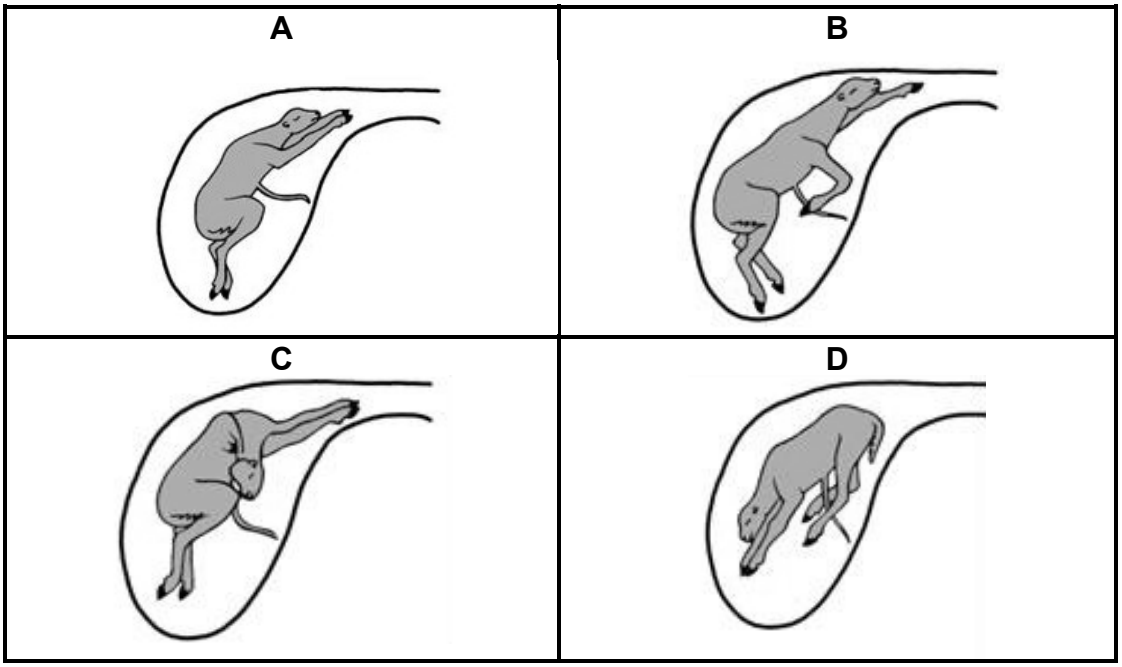
4.4 The table below compares conception rates during natural and artificial insemination.

MATING TYPE	CONCEPTION RATE (%)	
	LOW BREEDING SEASON	HIGH BREEDING SEASON
Artificial	65	48
Natural	40	32

4.4.1 Present the information in the table above on a bar graph. (6)

4.4.2 Draw a conclusion based on the data in the table above. (2)

4.5 The diagrams below show different birth positions during parturition.



4.5.1 Name the situation that will happen during parturition due to birth postures **B–D**. (1)

4.5.2 Name the birth postures shown in:

(a) **B** (1)

(b) **D** (1)

4.5.3 Give TWO signs of a cow approaching parturition. (2)

4.5.4 Mention TWO causes of premature termination of pregnancy. (2)
[35]

TOTAL SECTION B: 105
GRAND TOTAL: 150

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