



Province of the
EASTERN CAPE
EDUCATION

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

SEPTEMBER 2014

AGRICULTURAL SCIENCES P1

MARKS: 150

TIME: 2½ hours



This question paper consists of 15 pages.

INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions in the ANSWER BOOK.
2. Start EACH question on a NEW page.
3. Read ALL the questions correctly and answer only what is asked.
4. Number the answers correctly according to the numbering system used in this question paper.
5. Non-programmable calculators may be used.
6. Show ALL your calculations, including units and formula, where applicable.
7. Write neatly and legibly.

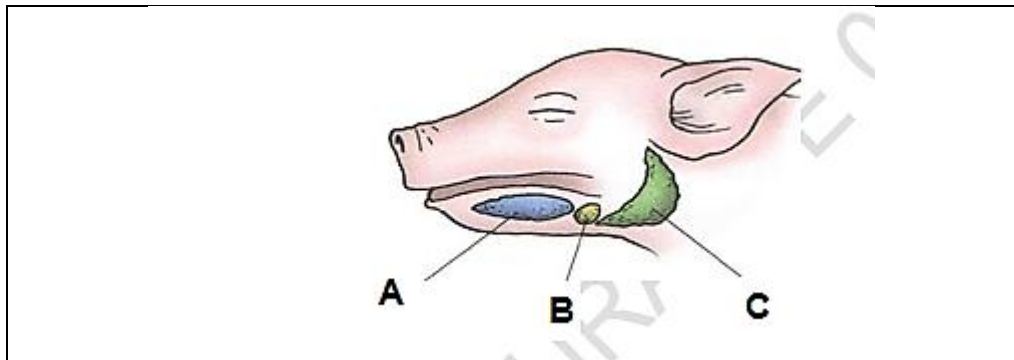
SECTION A**QUESTION 1**

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

1.1.1 The ... of the fowl can be compared with the abomasum of a ruminant.

- A ventriculus
- B glandular stomach
- C crop
- D stone stomach

1.1.2 The salivary gland in the part numbered **C** is known as ...



- A parotid.
- B sublingual.
- C submandibularies.
- D amylase.

1.1.3 A feed with 64% total non-nitrogenous substances and a digestible protein of 8%, has a nutritive ratio of ...

- A 1 : 6.
- B 1 : 7.
- C 1 : 9.
- D 1 : 8.

1.1.4 A herb with an unpleasant smell and taste which is commonly found in soybean seed and in some cereal seed plants is a ...

- A maize fungus.
- B Cape turlip.
- C thorn apple.
- D poisonous bulb.

1.1.5 The following is a sign of cattle NOT in distress:

- A Pawning
- B Snorting
- C Pinned ears
- D Grazing with other cattle

1.1.6 The diagram below indicates a farming system used in rural communities.



- (i) Production is used only for the family
- (ii) Small-scale farming
- (iii) Very little technology used
- (iv) High production

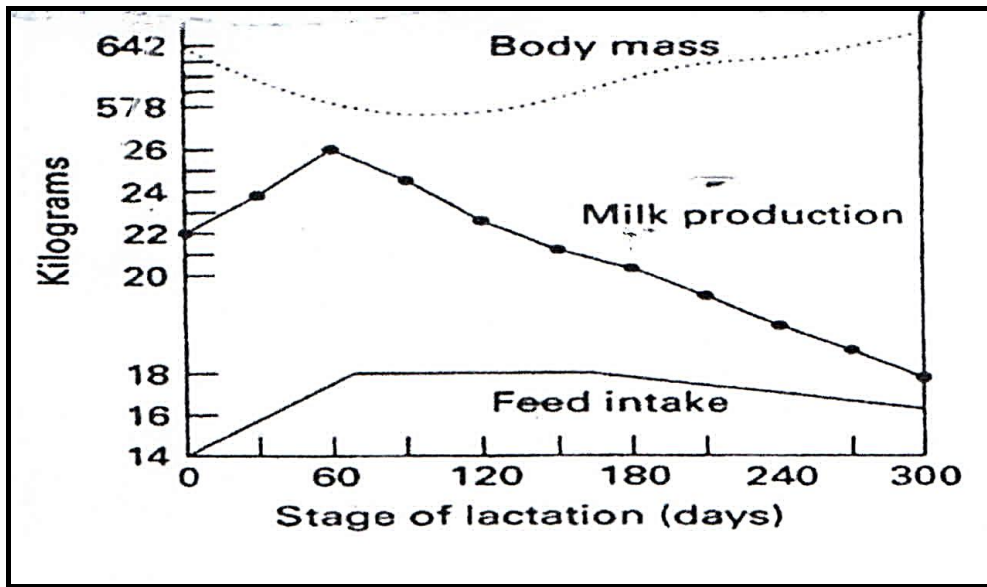
Choose the correct combination.

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

1.1.7 A condition in which large amount of oestrogen is secreted resulting in the cow being permanently in oestrus:

- A Mummification
- B Hydrocephalus
- C Metritis
- D Nymphomania

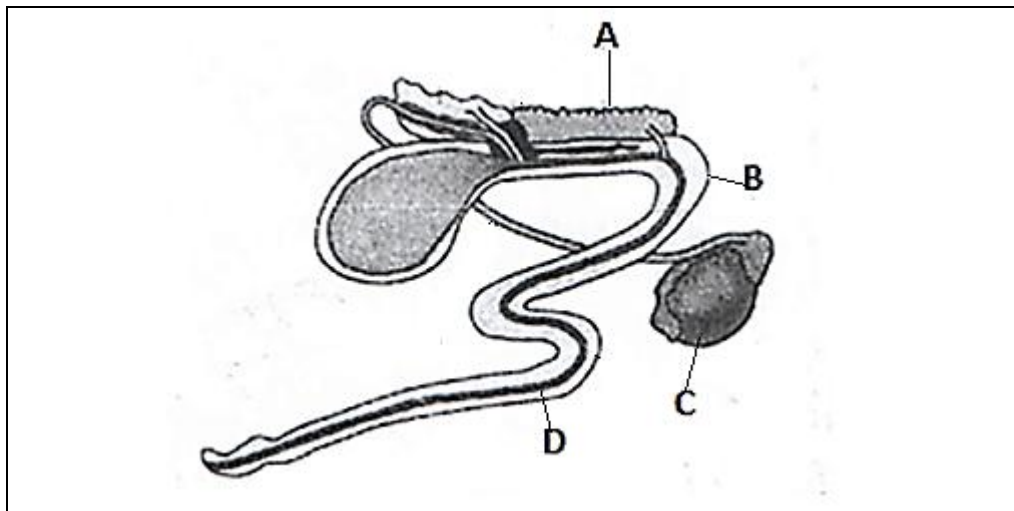
1.1.8 The graph below illustrates the milk production, feed intake and body mass of a cow over a lactating period:



The following is NOT illustrated in the graph:

- A Body mass decreases with an increase in feed intake and milk production.
- B When milk production is at its highest, feed intake and body mass increased.
- C Milk production increases with feed intake.
- D At 250 days nutrients are utilised to increase body mass.

1.1.9 The part of the reproductive system of a bull responsible for secretion of testosterone is represented by the following letter:



1.1.10 The removal of the fertilised ovum from the uterus of a genetically superior cow to the uterus of a genetically inferior cow is ...

- A embryo flushing.
- B embryo harvesting.
- C embryo transfer.
- D embryo recovery.

(10 x 2) (20)

1.2 Indicate whether each of the following statements 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 number (1.2.1–1.2.5) in the ANSWER BOOK, for example 1.2.6 **A ONLY**.

COLUMN A		COLUMN B
1.2.1	A Proventriculus	The part of the stomach where physical digestion occurs
	B Ventriculus	
1.2.2	A Carbohydrates	Nitrogen-free extract
	B Lipids	
1.2.3	A Balling gun	Device used to insert a pill into animals' throats
	B Drenching gun	
1.2.4	A Immunity	An animal will not contract the disease
	B Pulse rate	
1.2.5	A Metritis	The heifer experience difficult calving
	B Abortion	

(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 number (1.3.1–1.3.5) in the ANSWER BOOK.

1.3.1 The feed given to suckling piglets when starting to wean them off milk

1.3.2 The value that expresses the amount of feed consumed to gain a kilogram of body weight or a product by an animal

1.3.3 The removal of the long wool on the area around the tail and down inside the legs to prevent blowfly strike

1.3.4 An intensive production system commonly used by indigenous farmers where a group of chickens are kept in a house or shed with plant material on the floor, until they have stopped laying eggs

1.3.5 The type of a cloning process where an organ or tissue is cloned from a cell in the patient, and returned to the patient after it has been cloned and grown in a laboratory

(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 (1.4.1–1.4.5) in the ANSWER BOOK.

1.4.1 A feed unit is a strategic plan for livestock to ensure that there is sufficient feed to meet the requirements of animals throughout the year.

1.4.2 The outer circle around a cow that is a space where it feels safe in, is known as a blind spot.

1.4.3 The prostaglandin hormone decreases when the *corpus luteum* regresses.

1.4.4 Vas deferens is a single two-lobed gland that surrounds the urethra in a ring-shaped form.

1.4.5 The process whereby an egg/ova are produced by the ovary is ovulation. (5 x 1) (5)

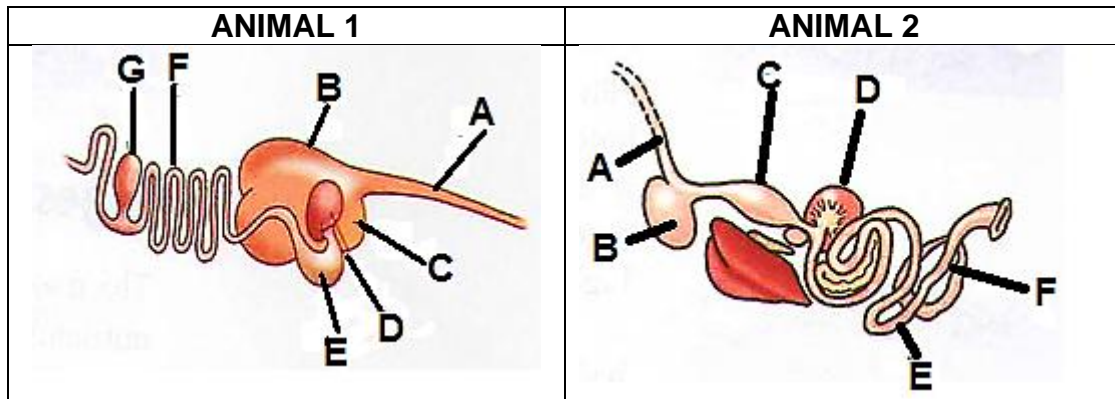
TOTAL SECTION A: 45

SECTION B

Start this question on a NEW page.

QUESTION 2: ANIMAL NUTRITION

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



2.1.1 Indicate a letter that represents the part where the following occurs:

- (a) Improperly chewed food land after swallowing in ANIMAL 1 (1)
- (b) Food is stored after swallowing in ANIMAL 2 (1)
- (c) Rennin and pepsin are secreted in both ANIMAL 1 and 2 (2)

2.1.2 Compare the adaptation of part B in ANIMAL 1 and part D in ANIMAL 2 with regard to digestion of food. (One adaptation of each part.) (2)

2.2 During a digestibility trial in a feedlot, cattle were fed 240 kg of hay and excreted 14 kg. The table below shows the components of feed consumed and excreted.

FEED COMPONENT	FEED CONSUMED (%)	FEED EXCRETED
Water	10	60
Crude protein	12	8
Ether extract	3	2
Crude fibre	5	7
Ash	3	1
Nitrogen-free extract	65	15

- 2.2.1 Calculate the digestibility co-efficiency of this hay. (6)
- 2.2.2 Determine the stage at which this hay was cut. (1)
- 2.2.3 Suggest a reason for your answer in QUESTION 2.2.2. (2)

2.2.4 Indicate the feed component from the table above, that represents the following:

- (a) Mineral (1)
- (b) Fat and fat soluble substances (1)
- (c) Feed component that depend on nitrogen content (1)
- (d) Soluble carbohydrates (1)

2.3 A veterinary doctor visited the local farmer specialising in farming with pigs. The farmer kept the pigs in a pen with a concrete floor. The doctor made some examination and also took blood samples from one of the sows. The results indicated the following:

A	Low oxygen blood carrying capacity
B	Bad sores on the skin

2.3.1 Identify the mineral deficient in observation A and B. (2)

2.3.2 Name the metabolic disease caused by the mineral deficient in A and B. (2)

2.3.3 Suggest a possible cause of the condition in A. (1)

2.3.4 Indicate an indigenous way to treat the condition in A. (1)

2.4 State the method of mineral supplementation suitable in each of the following situations:

2.4.1 Animals allowed to eat minerals according to their need (1)

2.4.2 Dairy cows with milk fever (1)

2.4.3 Minerals added to the concentrate feed (1)

2.5 A farmer has maize and raw peanut oilcake available for a balanced ration for his dairy cows. They need 16% protein in their ration for milk production. Maize has a protein content of 8% and peanut oilcake meal has a protein content of 36 %.

Use a Pearson square to calculate the ration of maize to peanut oilcake meal needed in the feed mixture. (4)

2.6 Calculating a Feed Conversion Ratio (FCR) assists the farmer to know how much feed is needed by an animal to gain a kilogram of body weight, or produce as a product.

Calculate the FCR if an animal consumed 4,8 kg of feed and gain 1,4 kg of body weight.

(3)

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QUESTION 3: ANIMAL PRODUCTION, PROTECTION AND CONTROL

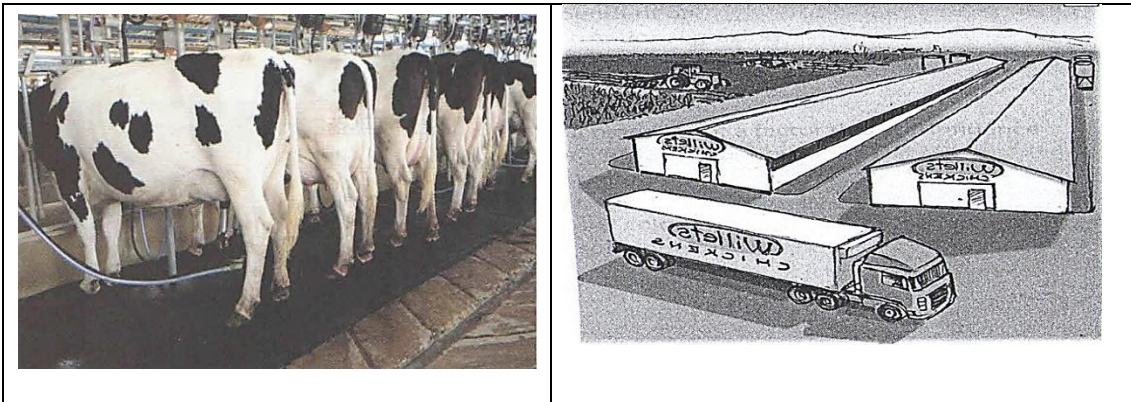
3.1 Read the passage below and answer the questions that follow.

Two farmers are specialising in broiler production. Farmer A keeps his broiler in an old house that is oriented in an east-west direction. The roof and walls are well insulated. The house is installed with micro-injectors. The stock density is 28 kg/m². Farmer B uses a steel container which is facing in a northerly direction with poor ventilation. The broilers are kept at a density of 48 kg/m².

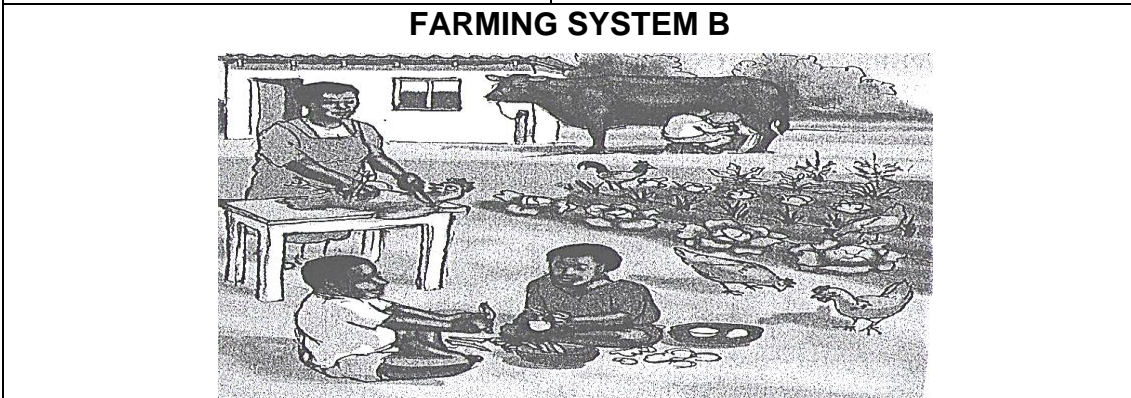
- 3.1.1 Identify the farmer who will have a high mortality rate of broilers. (1)
- 3.1.2 Motivate your answer by giving THREE reasons. (3)
- 3.1.3 Indicate the material or a layout used by farmer A to control the following environmental conditions:
- (a) Reducing solar heat penetration on hot days and reducing heat loss on colder days (1)
- (b) Reducing the effect of direct sunlight on side walls (1)

3.2 The pictures below represent the farming systems in different communities in South Africa.

FARMING SYSTEM A



FARMING SYSTEM B



- 3.2.1 Identify the farming systems illustrated in pictures A and B. (2)
- 3.2.2 Tabulate THREE visible differences between the farming systems in QUESTION 3.2.1. (6)

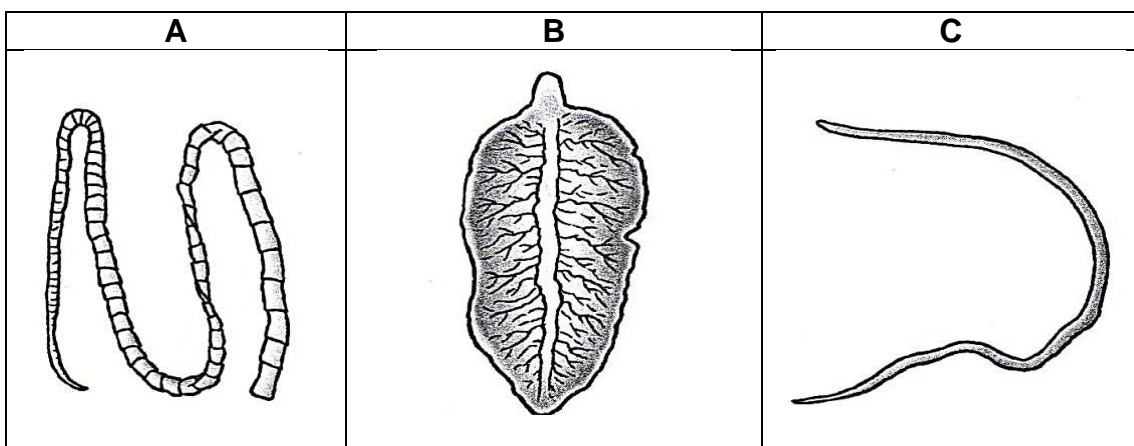
3.3 Different techniques and tools are used to handle farm animals. Below is a list of techniques used to handle different animals.

Prodding; hobbling; herding; blocking vision; immobilising

Match the above techniques with each of the following descriptions:

- 3.3.1 To hamper an animal's ability to walk normally (1)
- 3.3.2 To keep animals focused on a specific point (1)
- 3.3.3 Putting an electric current through animals' bodies to prohibit movement (1)

3.4 The illustrations below show the parasite that affect farm animals.



- 3.4.1 Categorise the parasites in the illustrations above. (1)
- 3.4.2 Give the names of the parasites labelled **A**, **B** and **C**. (3)
- 3.4.3 Indicate the parasite from the illustrations that needs two hosts to complete its lifecycle. (1)
- 3.4.4 State the environmental condition that influences the infestation of farm animals by these parasites. (1)
- 3.4.5 Indicate TWO biological measures to control these parasites. (2)

3.5 Plant poisons cause serious diseases and even death in animals. Farmers need to be aware of the plants that may be poisonous to livestock and take precautionary measures to prevent them.

- 3.5.1 Name TWO plants that may be poisonous to animals. (2)
- 3.5.2 Describe THREE symptoms of a thorn apple poison. (3)
- 3.5.3 Indicate the characteristic of a thorn apple which makes browsing animals to avoid it. (1)

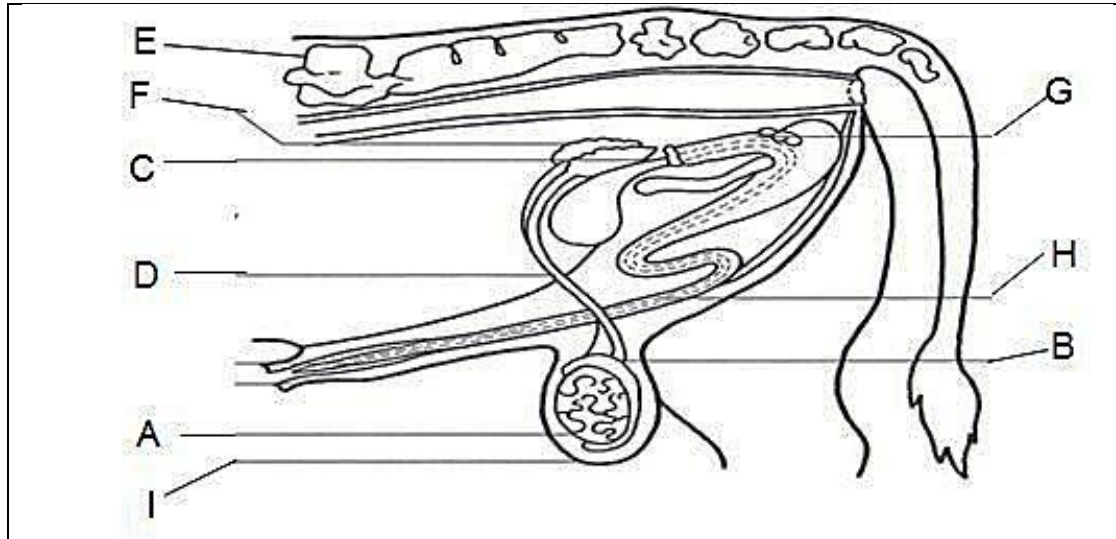
3.6 Name FOUR economic implications of animal diseases. (4)

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QUESTION 4: ANIMAL REPRODUCTION

4.1 The diagram below illustrates reproductive system of a bull.

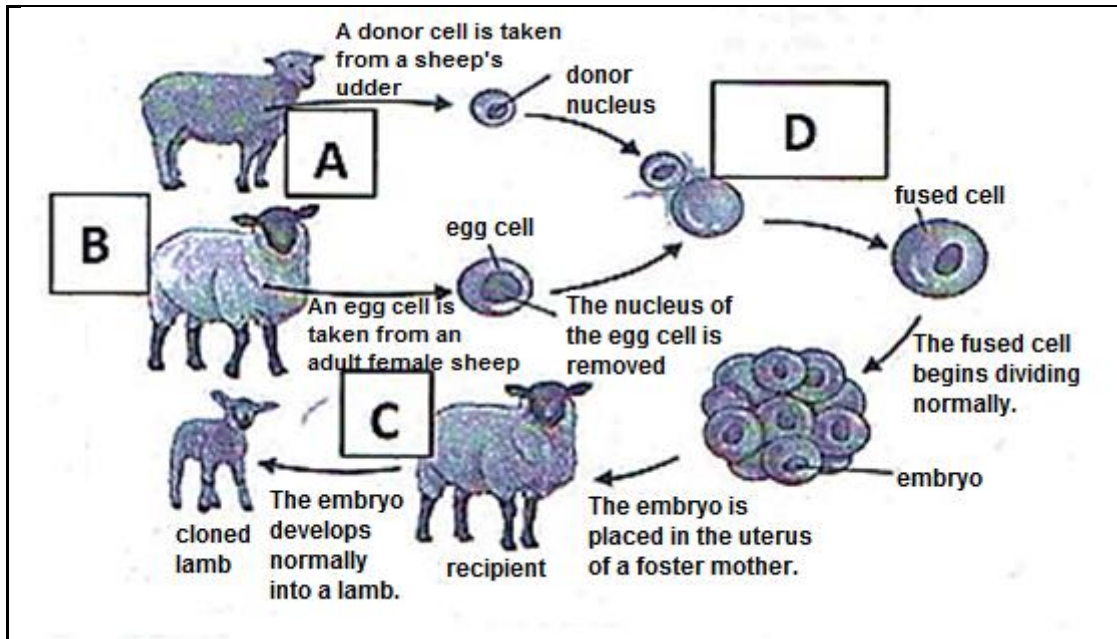


Indicate the **letter** and the **name** where each of the following occurs:

- 4.1.1 Production of the male sex hormone (2)
- 4.1.2 Concentration of spermatozoa (2)
- 4.1.3 Plays a role during ejaculation through powerful muscular contraction (2)
- 4.2 The bull can be infertile or completely sterile as a result of congenital defects which it is born with. This means it cannot produce offspring.
- 4.2.1 Provide TWO congenital defects that may occur in the part labelled **A** in the above diagram. (2)
- 4.2.2 Explain how each of the congenital defects mentioned in QUESTION 4.2.1, cause sterility in bulls. (4)

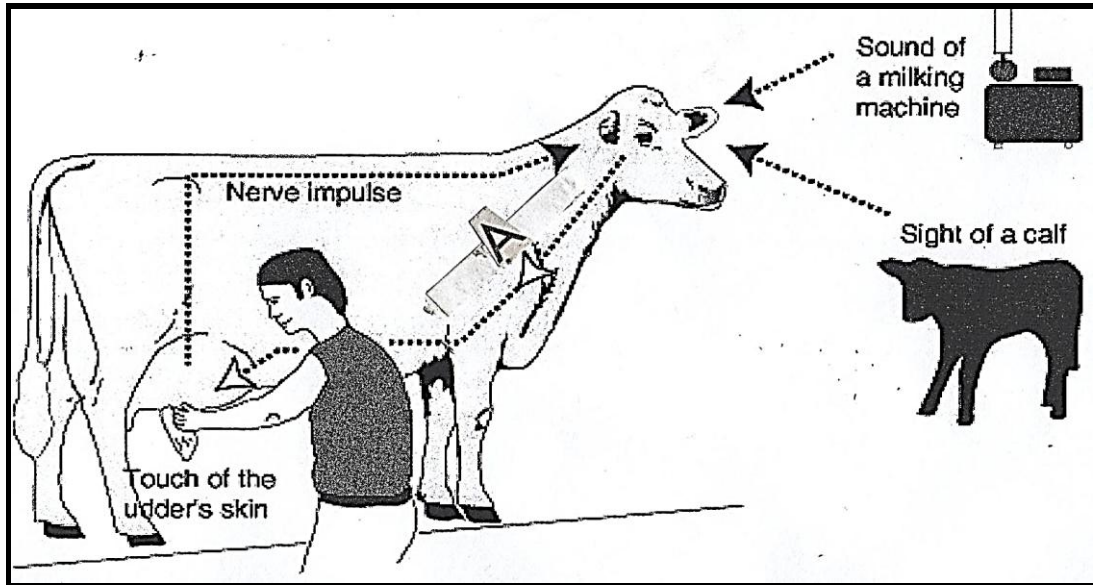
4.3 Read the passage below and answer the questions that follow.

Cloning is the process of producing similar populations of genetically identical individuals that occur in nature. In biotechnology, cloning refers to processes used to create copies of DNA fragments. There are different types of cloning processes.



- 4.3.1 Identify the type of cloning process illustrated above. (1)
- 4.3.2 Suggest a reason for the removal of the nucleus of the egg cell. (2)
- 4.3.3 Describe the process taking place at point D. (2)
- 4.3.4 At the end of the process illustrated above, the embryo develops normally into a lamb. Indicate the sheep between A, B and C which will be genetically identical to the cloned lamb. (1)
- 4.3.5 Motivate your answer in QUESTION 4.3.4. (2)

4.4 The illustration below indicates the process involved in a dairy cow.



- 4.4.1 Identify the process illustrated above. (1)
- 4.4.2 Indicate TWO stimuli visible in the illustration. (2)
- 4.4.3 Mention the hormone labelled **A**. (1)

4.5 The cow may experience a difficult parturition process which may need immediate intervention by a veterinarian. Delayed intervention may lead to the death of both the cow and the calf.

- 4.5.1 Deduce the term to refer to the situation in the scenario. (1)
- 4.5.2 Suggest TWO factors that cause the situation stated in QUESTION 4.5.1. (2)

- 4.6 The table below shows the milk production of cow **A** and cow **B** over a 22-week period.

WEEKS OF MILK PRODUCTION	MILK YIELD COW A litres/day	MILK YIELD COW B litres/day
2	32	29
4	44	40
6	45	42
8	45	44
10	43	41
12	28	40
14	30	39
16	33	38
18	34	37
20	35	36
22	36	35

- 4.6.1 Draw a line graph to indicate the milk production of cow **A** and cow **B** over a 10 week period. (5)
- 4.6.2 Identify a cow with mastitis. (1)
- 4.6.3 Give a reason for your answer in QUESTION 4.6.2. (2)
- [35]**

TOTAL SECTION B: 105
GRAND TOTAL: 150

