



Province of the
EASTERN CAPE
EDUCATION

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

SEPTEMBER 2012

AGRICULTURAL SCIENCES P1

MARKS: 150

TIME: 2½ hours



This question paper consists of 16 pages and an answer sheet.

INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions.
2. SECTION A (QUESTION 1) must be answered on the attached ANSWER SHEET.
3. SECTION B (QUESTIONS 2 to 4) must be answered in the ANSWER BOOK.
4. Start EACH question from SECTION B on a NEW page.
5. Read all the questions carefully and make sure that you answer what is asked.
6. Number the answers correctly according to the numbering system used in this question paper.
7. Place your ANSWER SHEET for SECTION A (QUESTION 1) in your ANSWER BOOK.
8. Non-programmable calculators may be used.
9. Write neatly and legibly.

SECTION A**QUESTION 1**

- 1.1 Various options are provided as possible answers to the following questions. Choose the correct answer and make a cross (X) in the block (A – D) next to the question number (1.1.1 – 1.1.10) on the attached ANSWER SHEET. NO marks will be awarded if more than one cross (X) appears for an answer.

EXAMPLE: 1.1.1

A	B	C	D
---	---	---	---

1.1.1 The Biological Value of feed is an index of its ...

- A lipid content.
- B energy content.
- C protein content.
- D mineral and vitamin content.

1.1.2 The stomach of a ruminant animal which corresponds to the glandular stomach of a pig is the ...

- A abomasum.
- B omasum.
- C rumen.
- D reticulum.

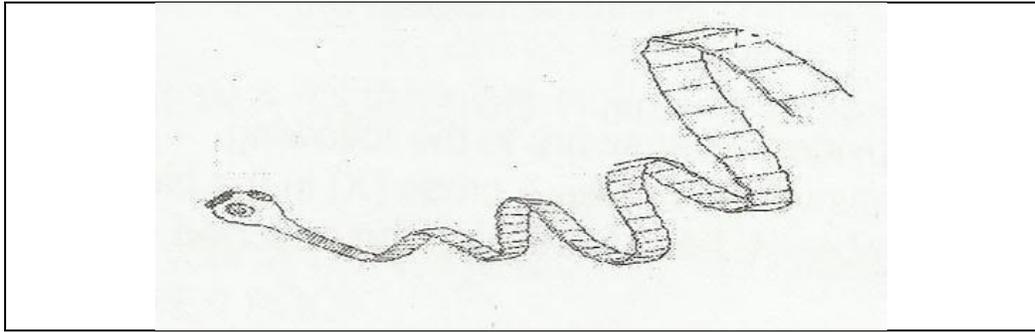
1.1.3 Animals secrete ... in order to attract animals of opposite sex.

- A hormones
- B oestrogen
- C mucus
- D pheromones

1.1.4 The end products of digestion which are absorbed in the rumen of the ruminant animals are ...

- A sugars.
- B fats.
- C amino acids.
- D volatile fatty acids.

1.1.5 The diagram below represents an ...



- A internal parasite called tapeworm.
 - B external parasite called tapeworm.
 - C internal parasite called flukeworm.
 - D external parasite called flukeworm.
- 1.1.6 The hormone that is found in lucerne and clover pastures that leads to oestrus in animals is ...
- A relaxin.
 - B oxytocin.
 - C oestrogen.
 - D prolactin.
- 1.1.7 The equipment that a beef farmer needs in order to measure the production output is the ...
- A castrating pliers.
 - B electronic scale.
 - C ear tag gun.
 - D neck clamp.
- 1.1.8 An organic chicken production system uses a dose of 250 ml of boiled Acacia Karoo bark administered to keep animals' healthy and productive. This practice was developed from ... knowledge.
- A contemporary
 - B European
 - C indigenous
 - D African

1.1.9 One of the following could lead to the delayed rigor mortis, poor meat quality and lower grading of a carcass.

- A Feeding animals on high protein levels.
- B Extremely good handling of farm animals.
- C Incorrect handling of farm animals which can lead to injury.
- D Slowly driving the animals to the abattoir.

1.1.10 ... is the bacterial disease that could bring about or result in the untimely expulsion of an underdeveloped foetus.

- A Anthrax
- B Brucellosis
- C Mastitis
- D Tetanus

(10 x 2) (20)

- 1.2 In the table below a statement with TWO possible answers are given. Decide whether the statement in COLUMN B relates to A only, B only, both A and B or NONE of the answers in COLUMN A and make a cross (X) in the block (A – D) next to the question number (1.2.1 – 1.2.5) on the attached ANSWER SHEET.

Example:

COLUMN A		COLUMN B
A:	Relaxin	Hormones responsible for relaxation of the pelvis.
B:	Oxytocin	

Answer:

The statement refers to:			
Only A	Only B	A and B	None
A	B	C	D

COLUMN A			COLUMN B
1.2.1	A:	Mites	The external parasites in sheep that attacks the tail areas
	B:	Blowflies	
1.2.2	A:	Thermometer	An instrument used to determine body temperature of animal
	B:	Barometer	
1.2.3	A:	Cryptorchidism	Testes do not descend into the scrotum
	B:	Hypoplasia	
1.2.4	A:	Pharynx	Controls both exit and entrance of food to the stomach
	B:	Larynx	
1.2.5	A:	Metabolic energy	The portion of energy that is used for growth, fattening and work purposes
	B:	Digestible energy	

(5 x 2) (10)

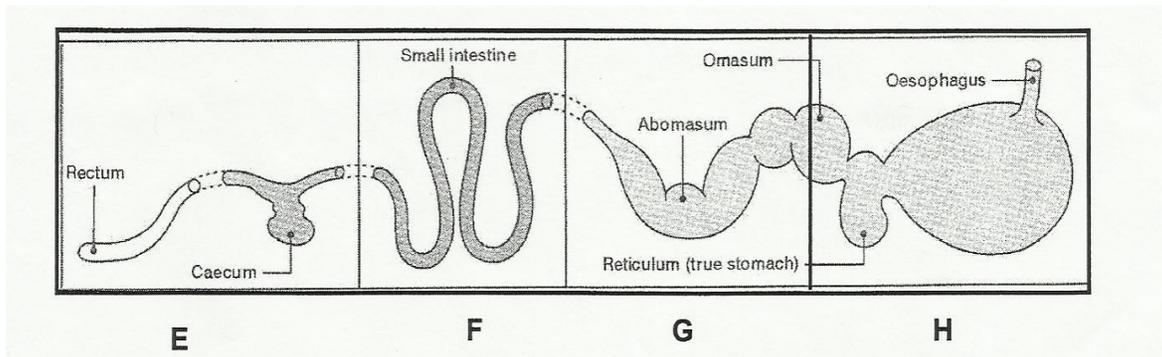
- 1.3 Give ONE word/term for each of the following descriptions. Write only the word/term next to the question number (1.3.1 – 1.3.5) on the attached ANSWER SHEET.
- 1.3.1 The total monetary value of goods produced and services provided in a country in one year.
- 1.3.2 The stomach of a fowl where enzymatic digestion takes place.
- 1.3.3 The traditional African custom in which a man pays a price in the form of cattle, to the family of a bride to be, to compensate him for his expenses of raising her.
- 1.3.4 The muscular ring like structure found between the stomach and the oesophagus of the pig.
- 1.3.5 The process whereby an elastic ring is used to remove the animal tail.
(5 x 2) (10)
- 1.4 Change the UNDERLINED WORD(S) in the following statements to make them TRUE. Write the appropriate word(s) next to the question number (1.4.1 – 1.4.5) on the attached ANSWER SHEET.
- 1.4.1 Castration is the period that starts with fertilisation and ends with parturition.
- 1.4.2 The structures in the wall of the small intestines that increases the absorption surface is succus entericus.
- 1.4.3 Spermatogenesis refers to the release of an abnormal large number of ova in one ovulation.
- 1.4.4 Nett energy is the energy which is released when the substance is completely oxidised to carbon dioxide, water and gases.
- 1.4.5 The fodder that contains little crude fibre, but large amounts of digestible nutrients is roughages.
(5 x 1) (5)
- TOTAL SECTION A: 45**

SECTION B

Start this question on a NEW page.

QUESTION 2: ANIMAL NUTRITION

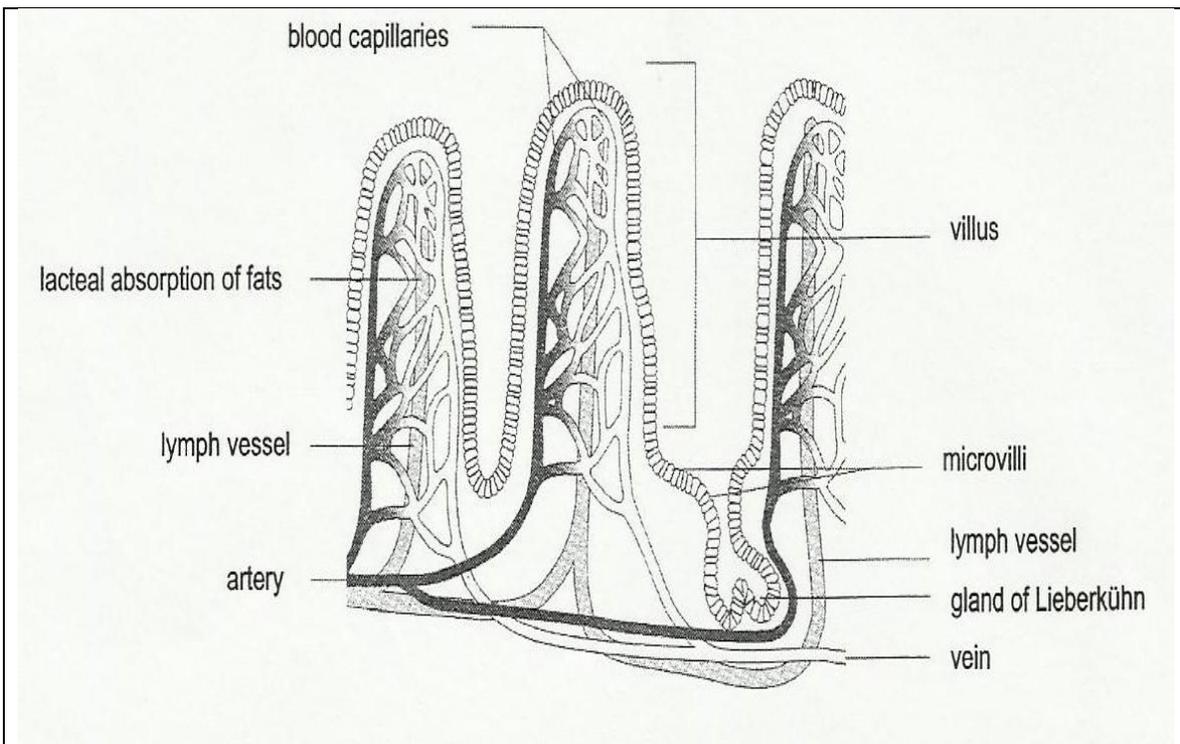
2.1 There are FIVE stages in the processing of food in the body of an animal to release energy and nutrients into the body cells. The schematic representation (DIAGRAM) below refers to the path of food through the alimentary canal of a farm animal.



2.1.1 Match the part of the alimentary canal of a farm animal indicated by labels E – H above with the following descriptions.

- | | |
|--|-----|
| (a) Maximum absorption of food takes place here. | (1) |
| (b) Water absorption takes place in this part. | (1) |
| (c) Bile and pancreatic juice are deposited in this part. | (1) |
| (d) Undigested food with micro-organisms is found in this part. | (1) |
| (e) Enzymatic digestion and the action of contents of the gastric juice are functional in this part. | (1) |

- 2.2 The diagram below represents a structure that plays a very important role in the absorption of nutrients.



- 2.2.1 Identify the part of the alimentary canal where this structure can be found. (1)
- 2.2.2 Briefly explain the adaptation of this structure which makes it suitable to perform its function well. (3)
- 2.3 Read the following scenario and then answer the questions that follow.

Dairy herds should be divided into groups with basically similar requirements. The yearly feed requirement of a single lactating dairy cow producing an average of 30 litres of milk per day. The farmer feeds his dairy cows a ration which consists of 60% roughage and 40% concentrates.

- 2.3.1 Tabulate the differences between roughages and concentrates. (4)
- 2.3.2 In a feed trial conducted by Grade 12 learners 3 200g of green lucerne having a moisture content of 58% was fed to cows daily. The cow on average defecated 1 250g of faeces daily with a moisture content of 45%. Calculate the co-efficient of digestion of the lucerne. Show all your calculations in the answer book. (6)
- 2.3.3 Suggest THREE ways to improve the digestibility of lucerne hay. (3)

- 2.4 Identify the specific nutrient that can be related to the following descriptions.
- 2.4.1 The element which is necessary for the Keratinisation process in the body. (1)
- 2.4.2 A nutrient which can prevent milk fever and fragile bone in dairy cows. (1)
- 2.4.3 A substance which occurs in germs of cereals that prevent "stargazer" disease in chicken. (1)
- 2.4.4 An organic compound that is soluble in fats which stimulates formation of prothrombin. (1)
- 2.4.5 A micronutrient which occurs in green leafy feeds and is needed for transportation of oxygen in the body fluids of animals. (1)
- 2.4.6 A micro nutrient that is a constituent of Vitamin B₁₂. (1)
- 2.5 Mention any THREE growth stimulants for farm animals. (3)
- 2.6

Lucerne is one of the most widely produced hay crops. It provides six or more cuttings per season and is also one of highest yielding hay crops with a total digestible nutrient (TDN) OF 75% and a digestible protein (DP) OF 15%.

- 2.6.1 Use a suitable formula to calculate the nutritive ratio of lucerne mentioned above. Show all your calculations. (4)

[35]

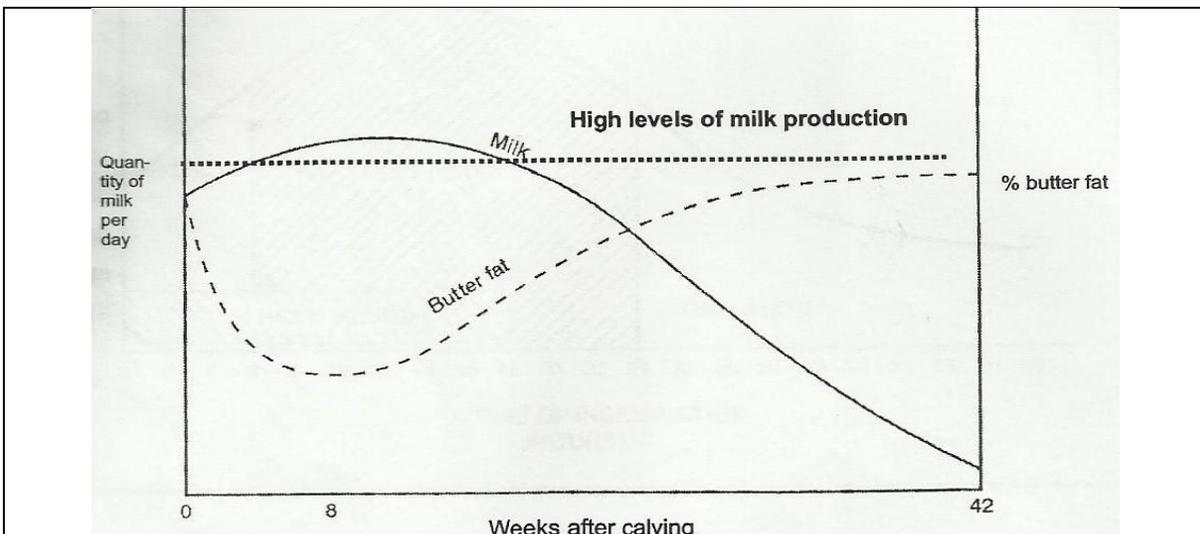
QUESTION 3: ANIMAL PRODUCTION

Start this question on a **NEW** page.

- 3.1 Read and analyse the following scenario and then answer the questions that follow.

Provision of shelter to animals could take the form of planting trees, building kraals or erecting concrete walls covered with roofing sheets. Shelter is used in both intensive and extensive farming systems. Beside preventing and protecting animals against unfavourable conditions and wild animals, it also means preventing stock theft and controlling pests in certain situations. Animals which are exposed to unfavourable conditions can end up using more energy particularly under very low temperatures.

- 3.1.1 Distinguish between intensive and extensive farming systems. (4)
- 3.1.2 Identify **THREE** unfavourable conditions that animals may be exposed to in the absence of shelter. (3)
- 3.1.3 Deduce any **TWO** forms of shelter provision in the scenario that would be used by traditional farmers. (2)
- 3.1.4 Supply the name of a restricted area where a large number of farm animals are kept and fed for optimal production purposes. (1)
- 3.2 The graph below represents a normal lactation curve of dairy cows. Analyse it and answer the questions that follow.



- 3.2.1 Suggest the name of milk produced by the cow after calving. (1)
- 3.2.2 State **TWO** characteristics of the milk in QUESTION 3.2.1. (2)
- 3.2.3 Decide on the time in weeks when the cow reaches her maximum milk production. (1)

3.2.4 Determine the time in weeks when the cow will be in peak period production above the high level of production. (1)

3.2.5 Identify at least TWO stimuli that will affect the cow to release milk in her udder. (2)

3.3 Read and analyse the following scenario and then answer the questions that follow.

Scab and mange are the most common diseases that are affecting the livestock in the RSA. There are systemic drugs which are injected or poured on the skin and able to move through the body, but they are expensive. Acaricide (miticide) chemicals are used to control mange.

Their effectiveness to control this parasite is affected by poor penetration into the fur and skin. To improve this, goats are washed and vigorously scrubbed by hand in the infected areas. Indigenous knowledge gathered over time has also produced a viable alternative measure to control this condition in farm animals. Mandla learned from his grandfather that the castor bean (*Ricinus communis*) is a tropical plant that contains an insecticidal chemical known as racin in the leaves and stem.

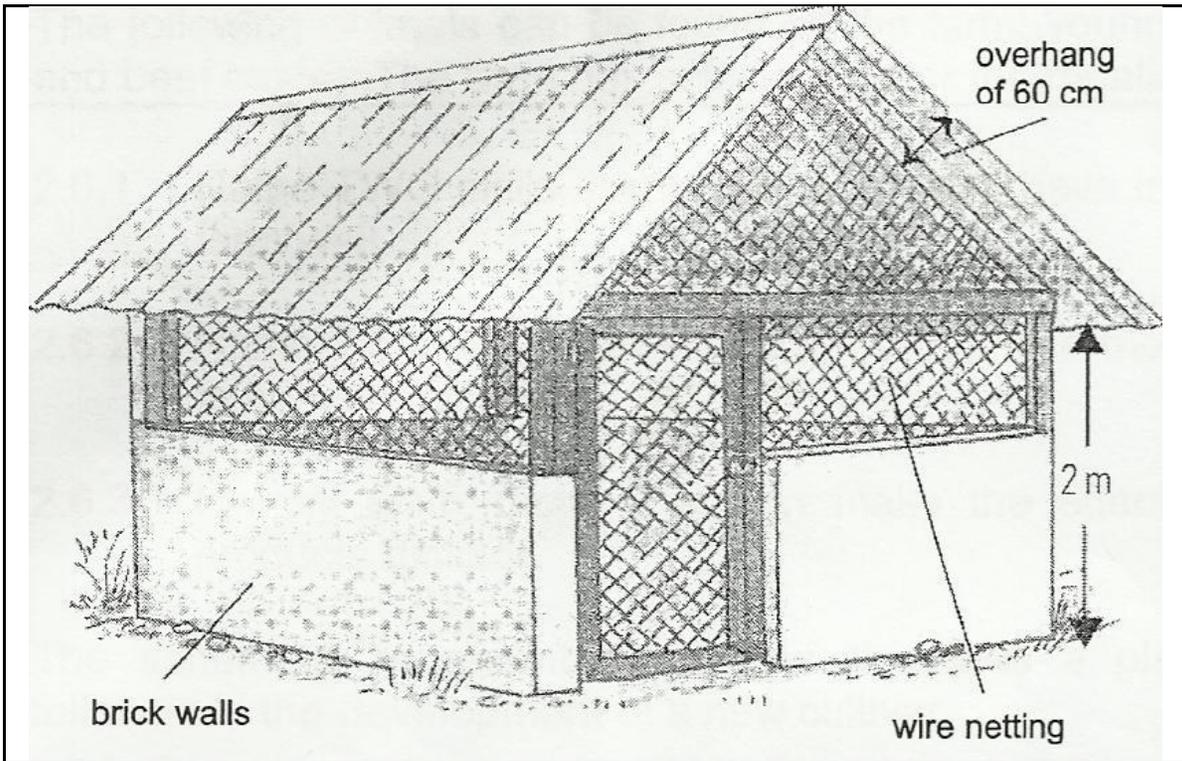
3.3.1 Indicate the problem that farmers experience with the application of acaricide chemicals. (1)

3.3.2 Mention the pest that is associated with scab and mange. (1)

3.3.3 Suggest TWO advantages of using the product with racin to control animal pests. (2)

3.3.4 Deduce from the information above THREE possible types of chemicals that can be used to control mange in goats. (3)

3.4 Effective poultry production depends largely on proper housing facilities. A common shelter used by farmers in the deep litter house is shown below.



3.4.1 Suggest FOUR requirements that this poultry farmer considered when above structure was designed. (4)

3.4.2 Briefly explain the beneficial effect of a structure such as the one above to poultry farmers. (3)

3.5 Losses arising from injury, bruises and death among cattle transported between farms and the abattoirs are substantial. This must be avoided for legal, humanitarian and financial reasons. It is imperative that cattle should be handled as sympathetically as possible to minimise these losses when transported to the abattoirs.

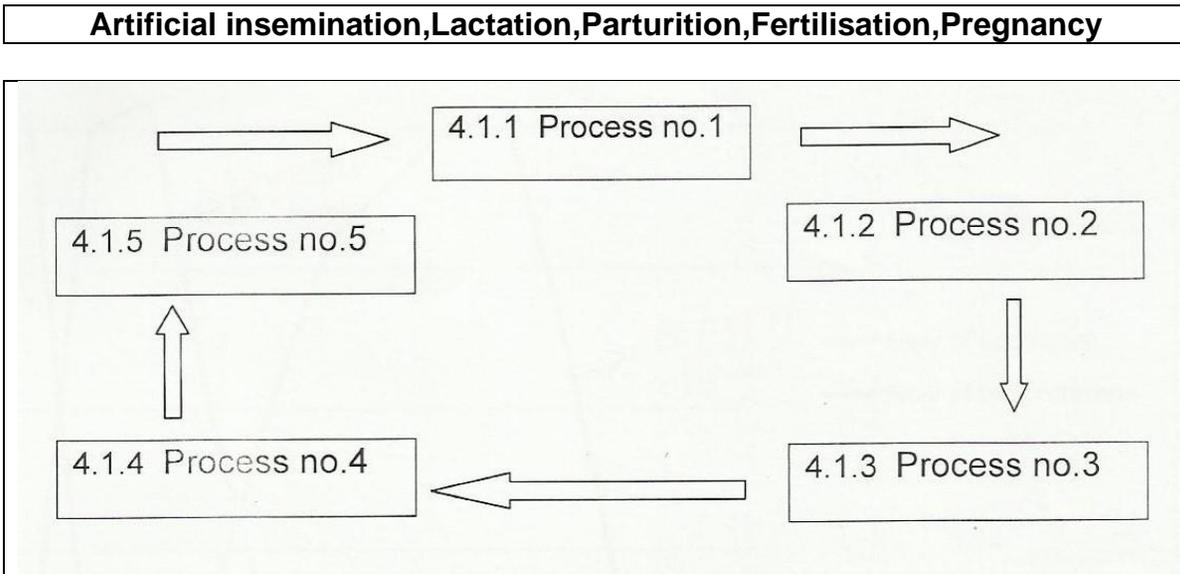
3.5.1 Outline any TWO basic aspects that should be considered when transporting beef cattle to the abattoir. (2)

3.5.2 Suggest TWO effects that the poor handling of farm animals may have on the quality of meat. (2)

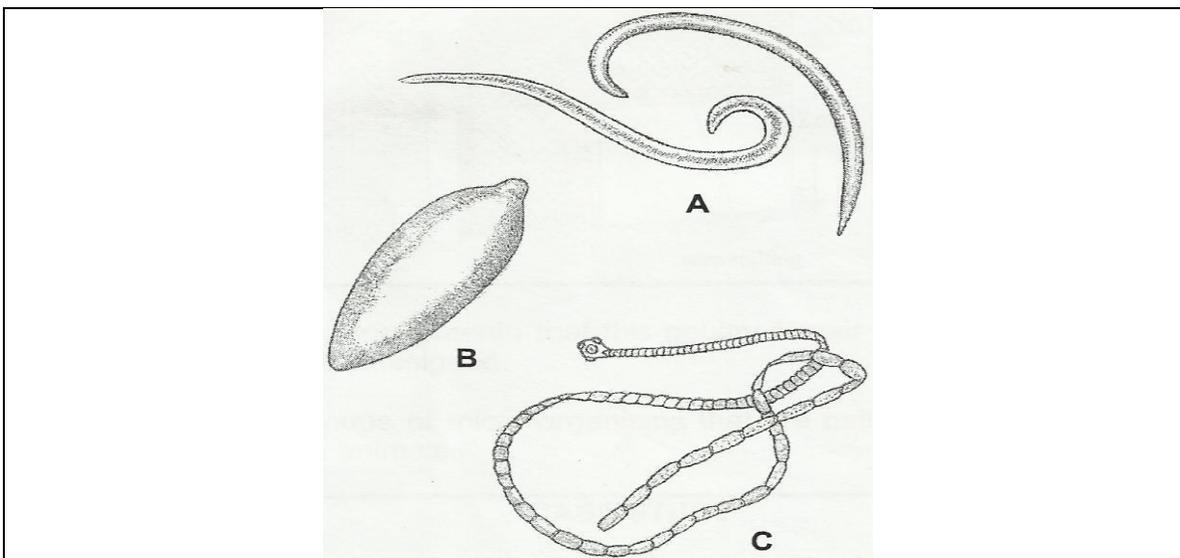
QUESTION 4: ANIMAL REPRODUCTION, PROTECTION AND CONTROL

Start this question on a **NEW** page.

- 4.1 Re-arrange the following processes of animal reproduction into their sequential order as illustrated in the schematic representation below.



- 4.2 The diagram below represents some internal parasites found in livestock.



- 4.2.1 Identify the parasites that are labelled A – C. (3)
- 4.2.2 Select TWO of these parasites that need TWO hosts to complete their life cycle. (2)
- 4.2.3 Briefly explain TWO economic losses that may be caused by these parasites. (2)

4.2.4 The state has an important role to play in the prevention and control of animal diseases and pests. Justify this statement by providing FOUR services that the Department of Agriculture renders in this regard. (4)

4.3 Analyse the following information and answer the questions that follow.

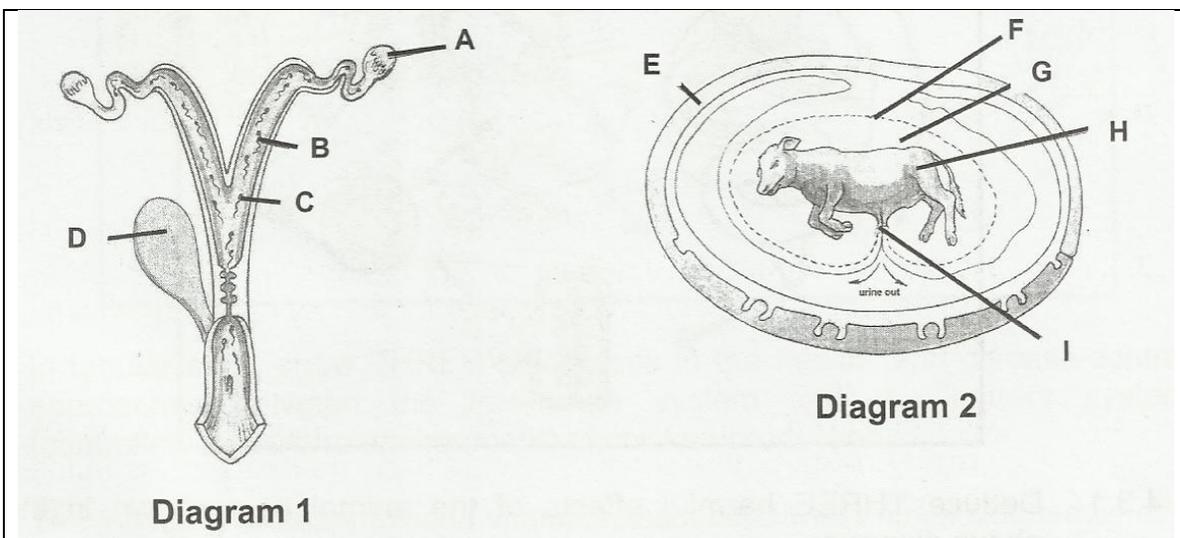
Oestrogen and progesterone play a tremendous role in the regulation of hormonal flow in female animals. The table below shows the flow of these two hormones over a period of 21 days.

TIME	0	2	4	6	8	10	12	14	16	18	19	20	21
Flow of oestrogen	20	0	0	3	10	16	18	20	20	12	2	0	0
Flow of progesterone	1	20	21	10	2	1	1	1	1	0	0	0	0

4.3.1 Using data in the table above, plot two line graphs (on the same set of axis) of oestrogen and progesterone flow against time. (6)

4.3.2 Explain the relationship of these two hormones as depicted in the graph. (3)

4.4 The development of embryo starts with fertilisation and ends with the birth of a young one. The diagrams below indicate a developed embryo and some of the processes involved in fertilisation. Analyse the diagrams and then answer the questions that follows.



4.4.1 Identify the site where fertilisation occurs in Diagram 1. (1)

4.4.2 State TWO functions of the membrane that developed around the embryo. (2)

4.4.3 Mention the process during which the ripe ovum from the ovary is released and name the hormone responsible for this process. (2)

- 4.4.4 Pregnancy could be terminated before natural birth. Suggest TWO possible causes of this situation. (2)
- 4.4.5 Identify THREE visible signs that one could use to predict that the cow is about to give birth. (3)

[35]**TOTAL SECTION B: 105****GRAND TOTAL: 150**

SECTION A

ANSWER SHEET

NAME AND SURNAME: _____

QUESTION 1.1

.1.1	A	B	C	D
1.1.2	A	B	C	D
1.1.3	A	B	C	D
1.1.4	A	B	C	D
1.1.5	A	B	C	D
1.1.6	A	B	C	D
1.1.7	A	B	C	D
1.1.8	A	B	C	D
1.1.9	A	B	C	D
1.1.10	A	B	C	D

(10 x 2) (20)

QUESTION 1.2

	ONLY A	ONLY B	BOTH A and B	None
1.2.1	A	B	C	D
1.2.2	A	B	C	D
1.2.3	A	B	C	D
1.2.4	A	B	C	D
1.2.5	A	B	C	D

(5 x 2) (10)

QUESTION 1.3

- 1.3.1 _____
- 1.3.2 _____
- 1.3.3 _____
- 1.3.4 _____
- 1.3.5 _____

(5 x 2) (10)

QUESTION 1.4

- 1.4.1 _____
- 1.4.2 _____
- 1.4.3 _____
- 1.4.4 _____
- 1.4.5 _____

(5 x 1) (5)

TOTAL SECTION A:

45
