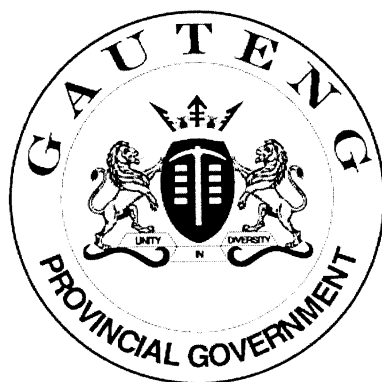




GAUTENG DEPARTMENT OF EDUCATION

PREPARATORY EXAMINATION 2009

10641

AGRICULTURAL SCIENCES

First Paper

15 pages

AGRICULTURAL SCIENCES: Paper 1
AGRS



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GAUTENG DEPARTMENT OF EDUCATION
PREPARATORY EXAMINATION

AGRICULTURAL SCIENCES
(First Paper)

TIME: 2½ hours

MARKS: 150

INSTRUCTIONS:

- Answer ALL questions from SECTIONS A and B.
 - Section A (Question 1) must be answered on the ANSWER SHEET provided.
 - Section B (Questions 2 to 4) must be answered in the ANSWER BOOK.
 - Start each question from SECTION B on a new page.
 - Study the questions carefully and make sure you answer what is asked.
 - Number your answers correctly.
 - Work neatly.
-
-

SECTION A

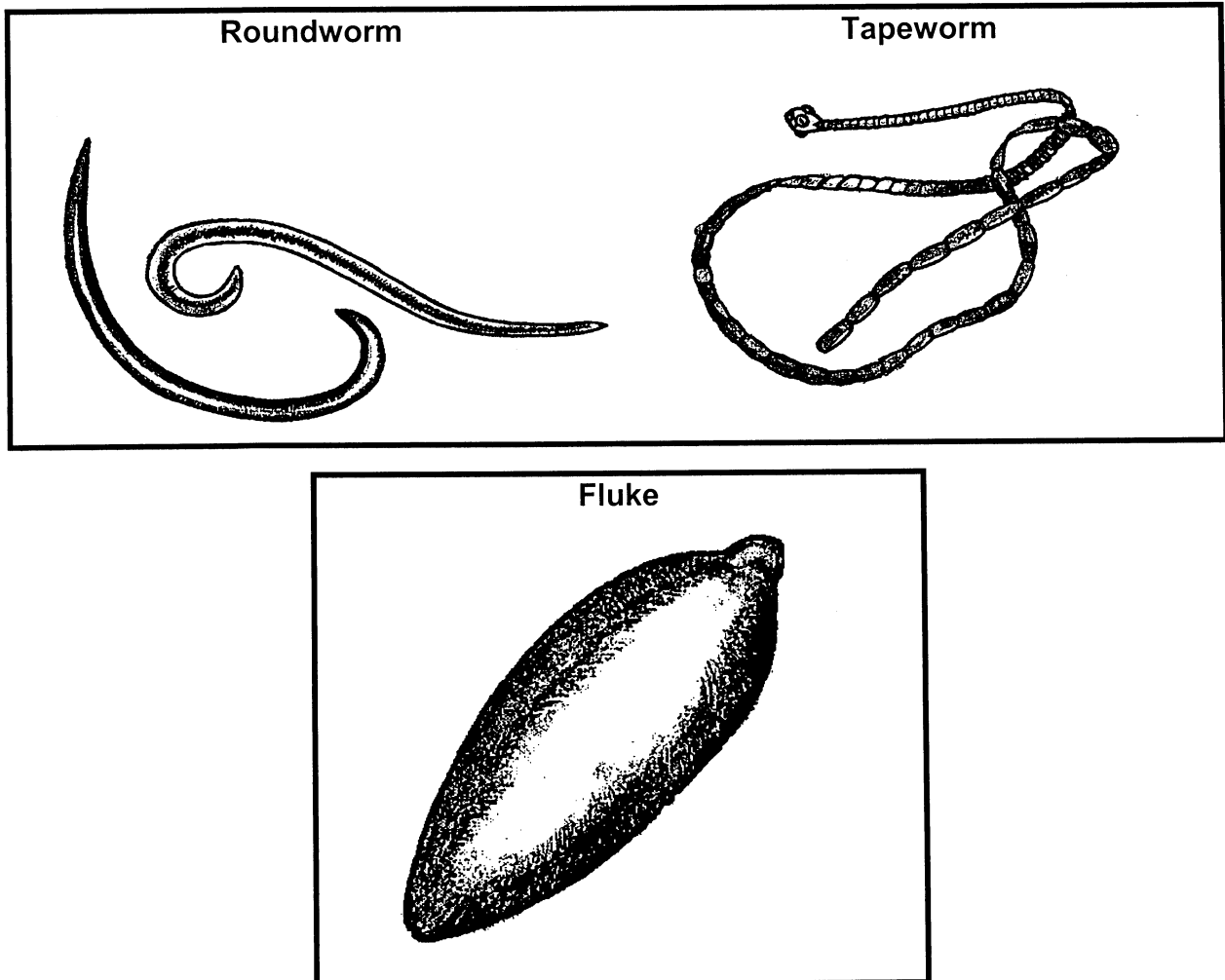
QUESTION 1

- 1.1 Various possible options are provided as answers to the following questions. Choose the correct answer and make a cross (X) in the relevant block (A – D) of Section A next to the question number (1.1.1 – 1.1.10) on the attached ANSWER SHEET.
- 1.1.1 One of the following functions or processes occurs in the gizzard of a chicken:
- A. Bacterial digestion
 - B. Mineral digestion
 - C. Chemical digestion
 - D. Mechanical digestion
- 1.1.2 Amino acids are the building blocks of _____.
- A. carbohydrates
 - B. lipids
 - C. proteins
 - D. cellulose
- 1.1.3 Net energy is defined as metabolic energy, minus energy lost through _____.
- A. heat
 - B. urine
 - C. faeces
 - D. cellulose

1.1.4 One of the following DOES NOT refer to administering drugs orally.

- A. Drench
- B. Infusion
- C. Pills
- D. Balling gun

1.1.5 One of the following organisms needs two animals for the completion of its life cycle.



- A. Roundworm
- B. Fluke
- C. Tampan
- D. Tapeworm

1.1.6 The small finger-like projections in the wall of the small intestine is responsible for the process of _____ .

- A. absorption
- B. adsorption
- C. digestion
- D. egestion

- 1.1.7 The membrane that surrounds an unborn calf that is responsible for removing urine is the _____ .
- A. chorion
 - B. allantois
 - C. placenta
 - D. amnion
- 1.1.8 The spermatozoa of the bull receive nutrition from the secretion of the _____ .
- A. Cowper's gland
 - B. epididymis
 - C. prostate
 - D. seminal visicles
- 1.1.9 An ideal feed that can be fed to layers aged from six to twelve weeks:
- A. Layer mash
 - B. Developer mash
 - C. Grower mash
 - D. Chick mash
- 1.1.10 A recommended feed that can assist in the prevention of rickets among young piglets is _____ .
- A. bone meal
 - B. urea
 - C. oil cake
 - D. lucerne hay

10x2= (20)

- 1.2 Match the **description** in **COLUMN A** with the **concept** in **COLUMN B**.
Write down only the correct letter (A – H) next to the relevant question number
(1.2.1 – 1.2.5), e.g. 1.2.6 I.

COLUMN A Description		COLUMN B Concept	
1.2.1	A cost-effective protein-rich concentrate for growing pigs	A.	Oestrus synchronization
1.2.2	Attacks result in the reduction of wool quality and lower yields	B.	Ventriculus
1.2.3	Valuable for artificial insemination in extensive conditions	C.	Cellulose enzyme
1.2.4	Cellulose, hemicellulose and lignin digestion	D.	Oats
1.2.5	Grinding of food occurs with the aid of small stones	E.	Fish meal
		F.	Sheep blowflies
		G.	Proventriculus
		H.	Pancreatic juice

5x2= (10)

- 1.3 Write down the correct term for each of the following descriptions.

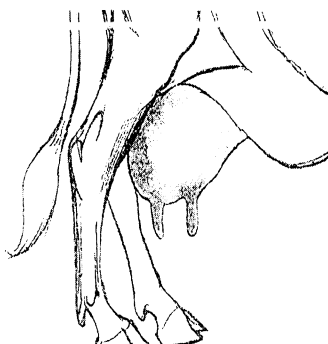
- 1.3.1 Feeds that contain a fair quantity of calcium, but are poor in phosphorus and vitamins
- 1.3.2 The gland that secrete succus entericus
- 1.3.3 The gross energy value minus the energy lost in manure, urine and gases
- 1.3.4 The period when the female animal will have a red swollen vulva with mucus strings on her hind legs
- 1.3.5 A practice during which the bark from a flat crown tree is used for the treatment of tapeworms in stock animals

5x2= (10)

1.4 Look at the illustrations of the following diseased animals.



Animal A



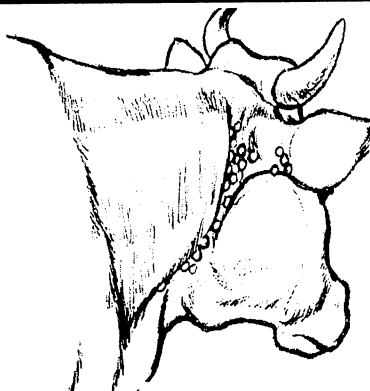
Animal B



Animal C



Animal D



Animal E

1.4.1 Indicate, from the list below, which disease is illustrated in each picture, A – E. Write down only the letter, e.g. F and the name of the disease.

Lumpy wool; avian flu; rabies;
gall water; mastitis

5x1=(5)

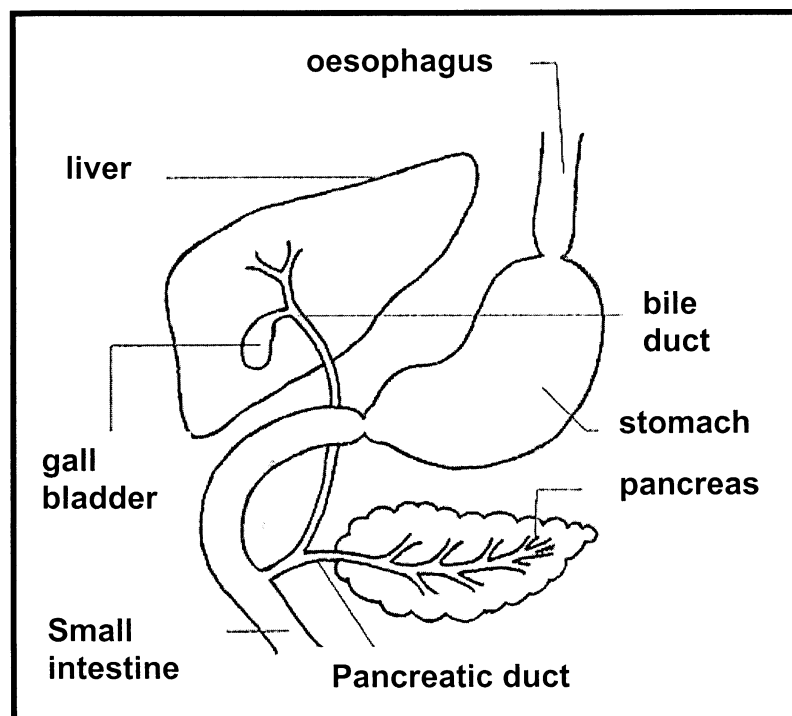
TOTAL FOR SECTION A: [45]

SECTION B

QUESTION 2

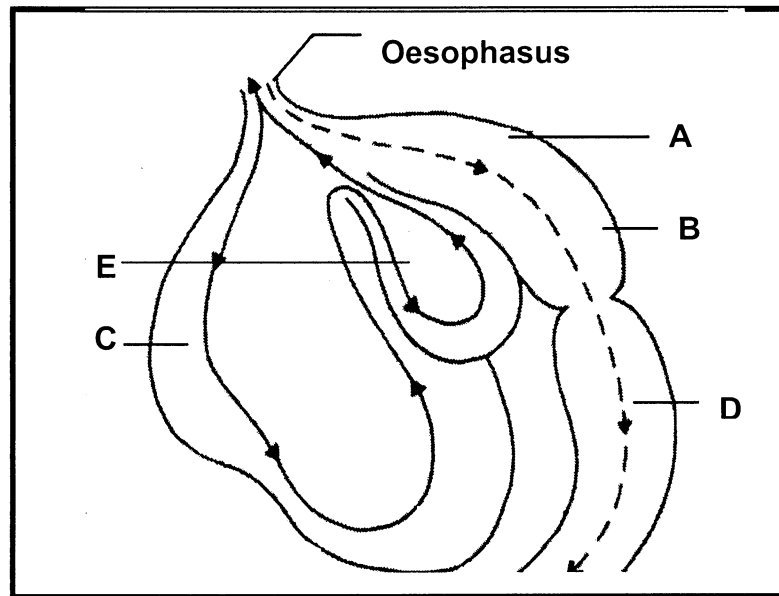
ANIMAL NUTRITION

- 2.1 The diagram below illustrates the digestive tract of an animal. The digestive tract helps with the breaking-down of large food molecules like proteins, fats and carbohydrates into simpler molecules so that they can be absorbed by the cells of the body.

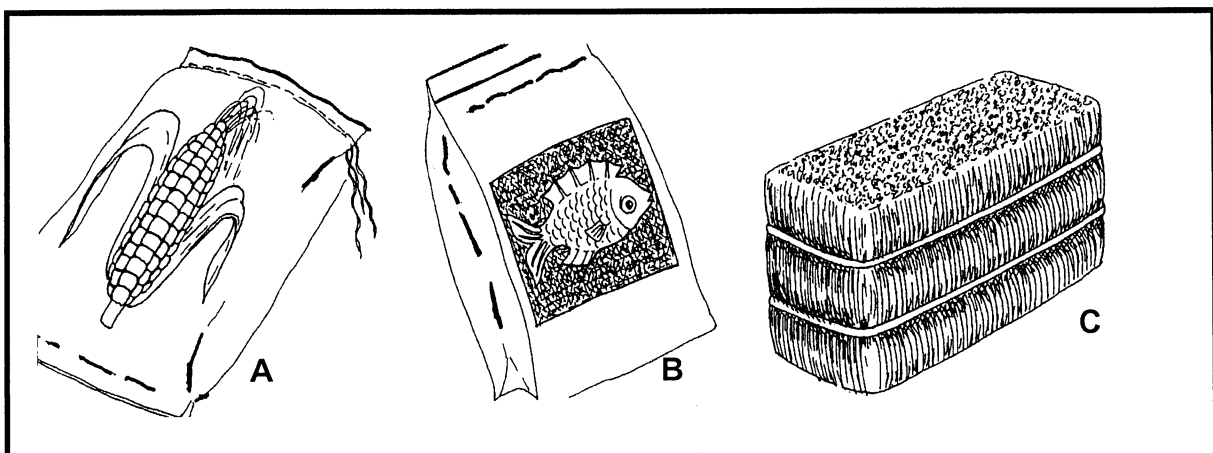


- 2.1.1 Supply the names of the THREE important fluids and indicate from the diagram where they originate. (6)
- 2.1.2 Briefly name TWO effects the fluid produced by the liver has on fats. (2)
- 2.1.3 Differentiate between *chemical* and *mechanical digestion*. (4)

- 2.2 Rumination is when the food is chewed, swallowed and brought back to the mouth or regurgitated, chewed and swallowed again. Large chunks of food are swallowed and stored in the rumen. Later the food is transported back to the mouth by retro-peristalsis. Refer to the diagram which illustrates the process of rumination and answer the questions that follow.



- 2.2.1 Describe the process of rumination in parts A, B, C, and E. (4)
- 2.2.2 Summarize the role played by the micro-organisms that live in parts C and E on cellulose. (4)
- 2.3 Name TWO gases produced in the alimentary canal of a ruminant during the process of digestion that could lead to bloating. (2)
- 2.4 Match the feed(s) in the illustration (A, B or C) to fit the situations that follow.
- (a) Fattening of old ewes
 - (b) Normal functioning of rumen microbes
 - (c) Increased milk production of dairy cattle
 - (d) Racing horses



(4)

- 2.5 You want to sell your weaner calves. They graze on green pastures. What feed supplement will you make available to them? (1)
- 2.6 Morongoa has recently acquired a dairy farm next to a successful dairy farmer in her area and he made the following recommendations to her:
- Feed dairy cows on cut and baled lucerne.
 - Feed chaff in the form of pellets, where urea and molasses are added.
- Give a reason for each of his recommendations. (4)
- 2.7 Using a Pearson square method, calculate the quantities of two feeds that Farmer Brown must mix in a ration in order to get the required digestible protein value (DP) of 16%. The DP value for Feed A is 22% and for Feed B, it is 7%. Show all your calculations. (4)
- (35)**

QUESTION 3

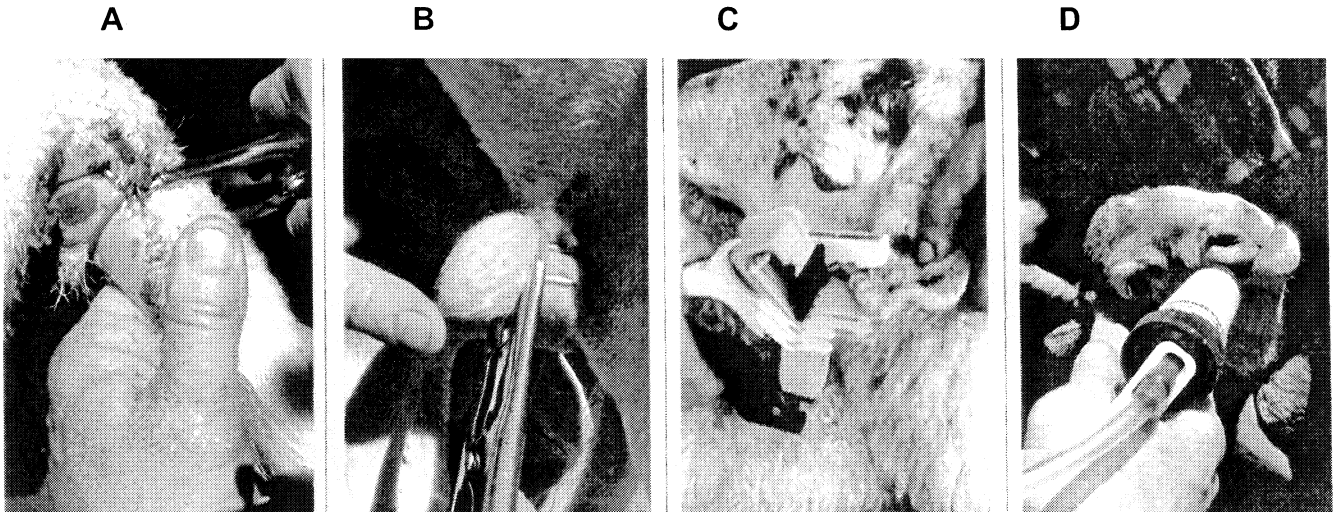
ANIMAL PRODUCTION

Case study:

Zinhle, a farmer, has a property situated in the summer rainfall area of the country. Hot summers and very cold winters are typical of the area. He is considering starting a feedlot to increase his production and is in the process of upgrading his animals. He is thinking about laying a pipeline from a neighbouring farm to obtain a more constant and better quality water supply. He is also considering applying for electricity supply to his farm.

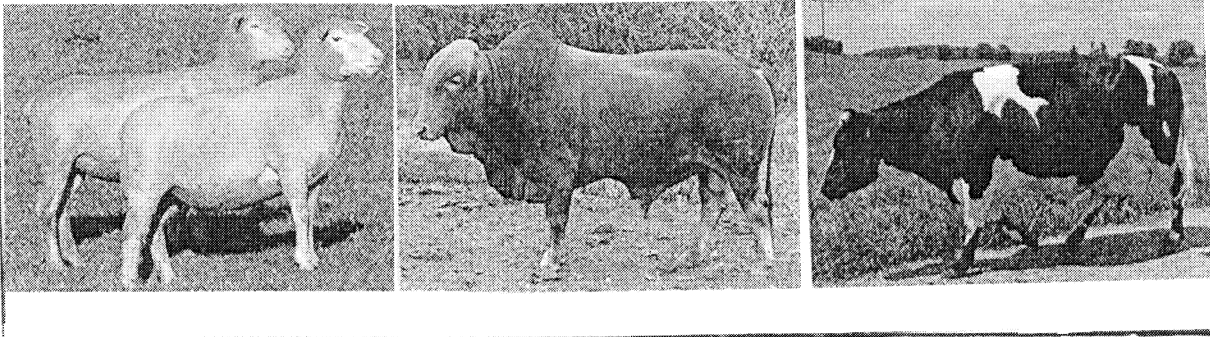
- 3.1.1 List THREE strategies that farmer Zinhle is considering introducing on his farm to make it more productive. (3)
- 3.1.2 He is facing another challenge, with regards to climate. Recommend a solution and justify it by supplying TWO reasons. (4)
- 3.1.3 Provide TWO other environmental factors that will affect animal production. (2)
- 3.1.4 Establish how starting a feedlot will assist farmer Zinhle in increasing his farm's productivity. (2)

- 3.2 The photos below show some practical activities on a sheep farm in the Karoo, following the lambing season. These activities may start as early as one week after lambing.



- 3.2.1 Name THREE possible aids that this farmer could use to relieve the labour shortage he is experiencing in handling his animals. (3)
- 3.2.2 Select an activity that would **only** involve male lambs. (1)
- 3.2.3 Give TWO possible reasons why the sheep in the photos look uncomfortable. (2)
- 3.2.4 Give your opinion whether the farming enterprise in the photos is intensive or extensive. Give reasons for your answers. (3)
- 3.3 Explain how incorrect handling of farm animals could be detrimental and affect their value. (4)
- 3.4 The feeding requirements of similar types of farm animals differ and for this reason, the farmer needs to draw up a feeding-flow program. Name any SIX functions the farmer needs to consider when drawing up a feeding-flow program. (6)
- 3.5 The production of farm animals can be increased by cross-breeding. The ideal is to mate a small-framed animal that has a low annual maintenance cost with a bigger male breed.

A farmer in your neighbourhood has approached you for advice on which breeds to use to increase his production in sheep and cattle (beef and dairy) breeds. The following are breeds that you suggested:



The Dormer

Indigenous cattle breed

Friesland

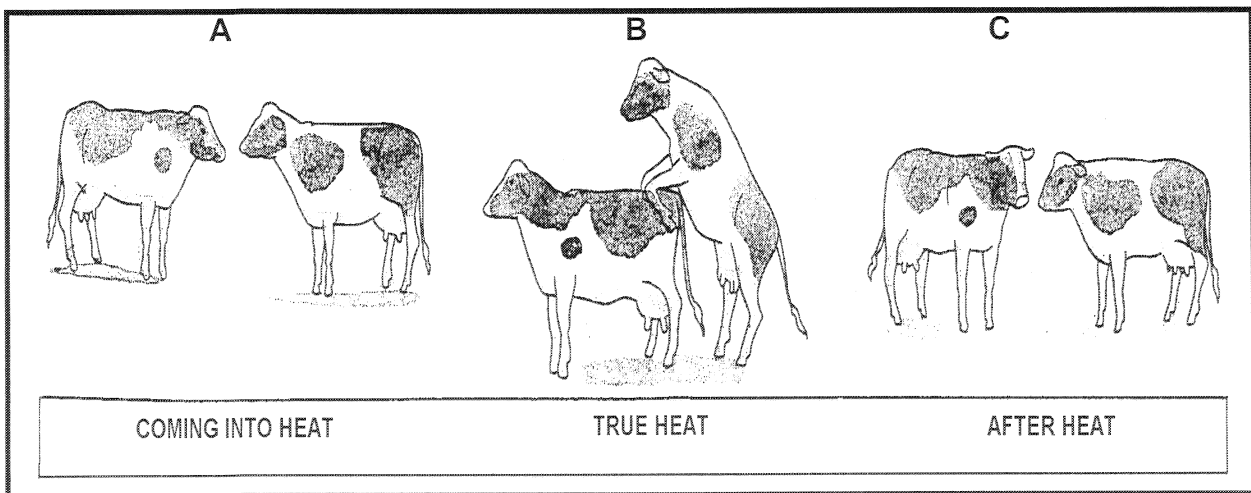
3.5.1 In your own words, define *cross-breeding*. (2)

3.5.2 Briefly describe THREE reasons for your suggestion to use the above animals. (3)
(35)

QUESTION 4

ANIMAL REPRODUCTION, PROTECTION AND CONTROL

4.1 The oestrus cycle is the regular recurring periods of oestrus or heat alternating with periods of sexual rest. It begins at puberty and repeats itself at regular intervals. The pictures below depict some of the stages that occur at various stages of the oestrus cycle.



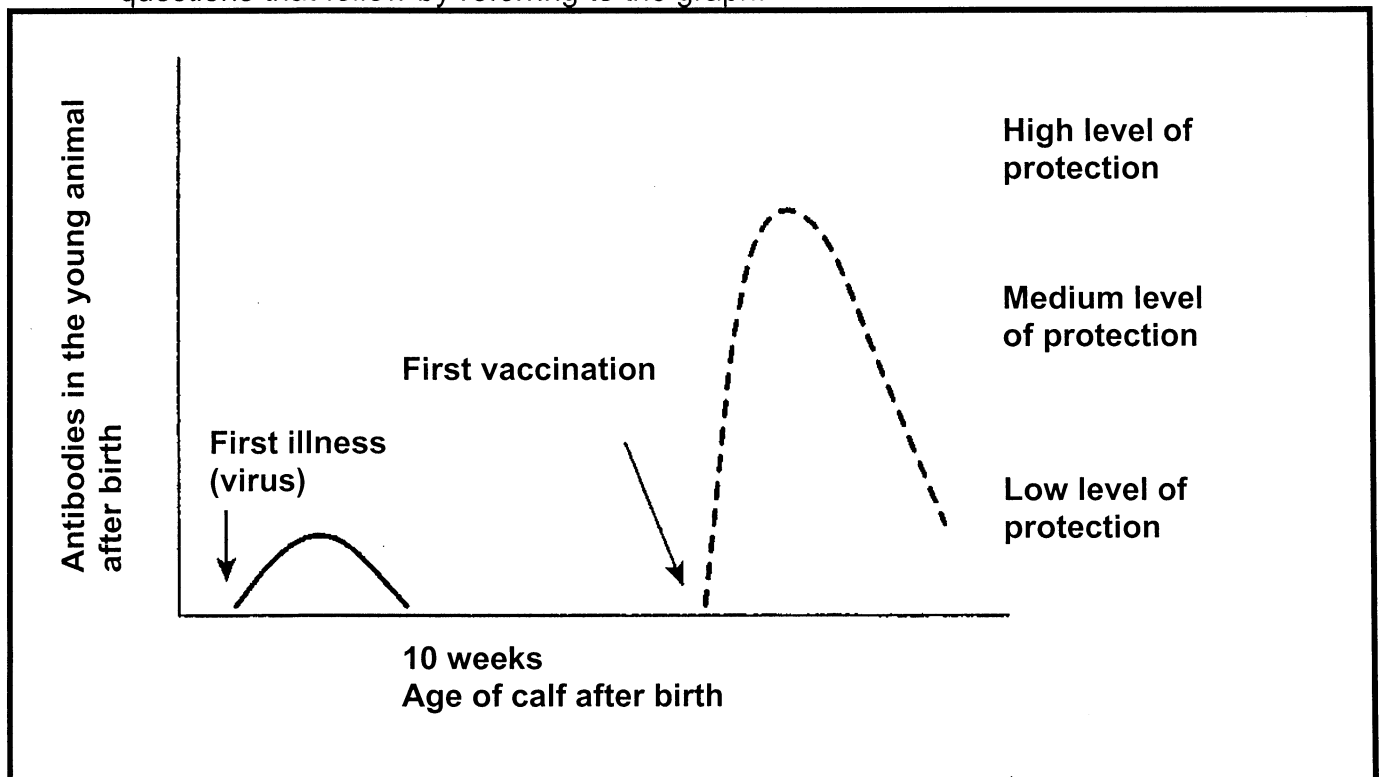
4.1.1 Identify the most important characteristics of each of the stages of the oestrus cycle as illustrated above. (3)

4.1.2 Supply the names of the hormones responsible for the characteristics in pictures **A** and **C**. (2)

- 4.2 A group of farmers in your area have requested you to come and present a lecture on artificial insemination.

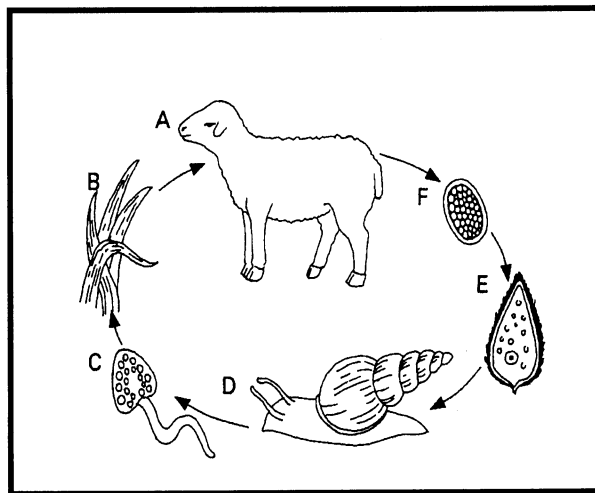
Provide THREE main aspects that you need to address in your presentation that will ensure the success of this procedure or technique. (3)

- 4.3 Refer to the graph below that contains data concerning the levels of antibodies in the animal body at different stages of development. Answer the questions that follow by referring to the graph.



- 4.3.1 Describe the effect of colostrum over time as indicated on the graph. (2)
- 4.3.2 "Few antibodies are formed in the calf during the first few weeks". Defend this statement. (2)
- 4.3.3 Explain the meaning of the following terms:
- A. Colostrum (2)
 - B. Antibodies (2)
- 4.3.4 Describe the change in shape of the graph after the first vaccination. (2)

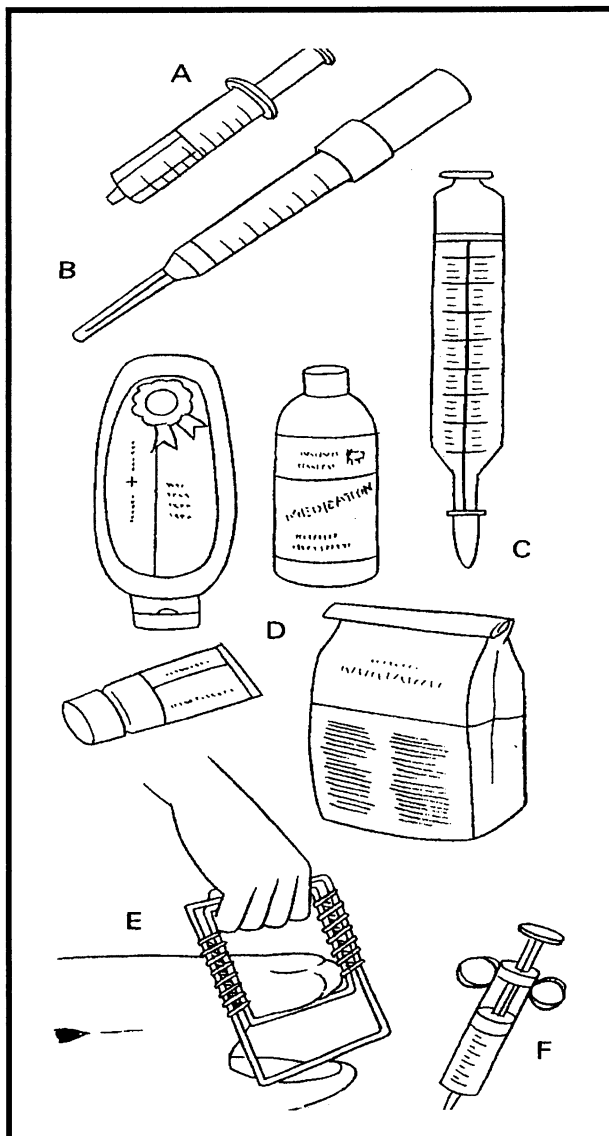
4.4 The diagram below illustrates the life cycle of the liver fluke.



- 4.4.1 Provide labels for letters **A – D** on the diagram. (4)
- 4.4.2 Suggest TWO indigenous methods that could be used to control roundworm or liver fluke at different stages of their life cycle. (2)
- 4.4.3 Indicate the effect of the toxin secreted by liver fluke on farm animals. (2)
- 4.4.4 State the name of the organism that causes East Coast Fever. (1)

4.5 4.5.1

From the diagram below, provide the letter (A – F) of the illustrated equipment or medication that you would use to carry out the following operations:



- (i) Insert liquids into the mouth of an animal
- (ii) Help determine the age of the animal
- (iii) Administer intramuscular injections
- (iv) An item comparable to herbs and natural extracts used in indigenous practices

(4)

4.5.2 Discuss the role of the state with regard to the following:

- A. Vaccines
- B. Control over livestock remedies

(2)

(2)

(35)

TOTAL FOR SECTION B: [105]

TOTAL: 150

END

ANSWER SHEET / ANTWOORDBLAD

SECTION / AFDELING A

NAME / NAAM: _____

QUESTION / VRAAG 1.1

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 / VRAAG 1.2

1.2.1
1.2.2
1.2.3
1.2.4
1.2.5

(5 x 2) (10)

QUESTION / VRAAG 1.3

1.3.1 _____
1.3.2 _____
1.3.3 _____
1.3.4 _____
1.3.5 _____
(5 x 2) (10)

QUESTION / VRAAG 1.4

1.4.1 A _____
B _____
C _____
D _____
E _____
(5 x 1) (5)

TOTAL SECTION / TOTAAL AFDELING A: 45