



education

Department:
Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

AGRICULTURAL SCIENCES P2

EXEMPLAR 2008

MARKS: 150

TIME: 2 hours

This question paper consists of 20 pages and an answer sheet.

INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions from SECTION A and SECTION B.
2. SECTION A (QUESTION 1) must be answered on the attached ANSWER SHEET.
3. Place the ANSWER SHEET for QUESTION 1 within your ANSWER BOOK.
4. SECTION B (QUESTIONS 2 to 4) must be answered in the ANSWER BOOK.
5. Start each question from SECTION B on a NEW page.
6. Read ALL the questions carefully and answer only what is asked.
7. Number the answers correctly according to the numbering system used in this question paper.
8. Write neatly and legibly.

SECTION A**QUESTION 1**

1.1 Various possible options are provided as answers to the following questions. Choose the 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 for SECTION A.

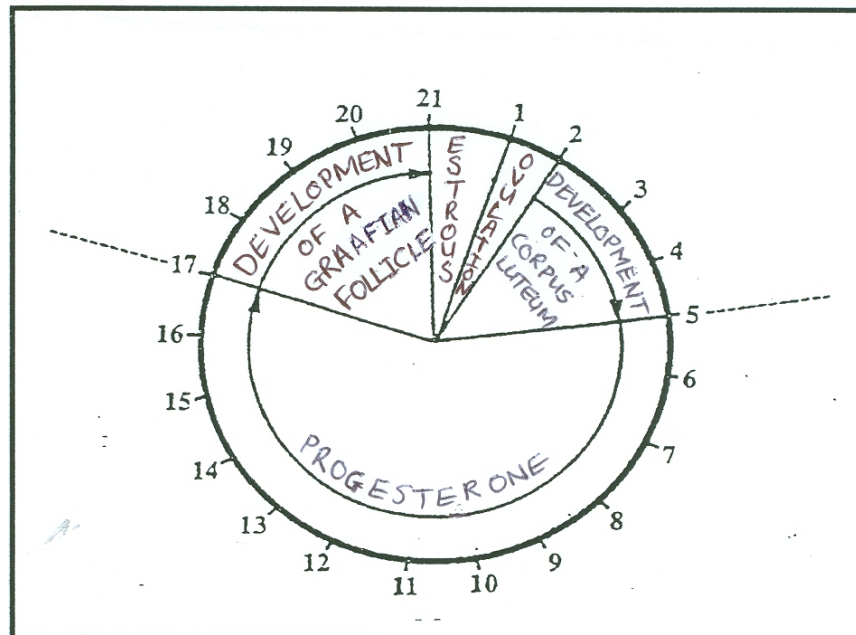
1.1.1 Which combination of the following descriptions best describes the external parasite?

- (i) Lives on the skin surface of the host
- (ii) Ticks may damage the skin
- (iii) These parasites may also secrete toxins
- (iv) Liver fluke infests animals through an intermediate host when these animals graze on wet areas

Choose the correct combination:

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

1.1.2 A diagrammatic representation of the oestrus cycle of a cow is indicated below. Identify the time in the oestrus cycle of a cow when she will allow mating.



- A After the first day of the oestrus cycle
- B Between the second and the fifth day
- C On day fifteen
- D A day before ovulation

1.1.3 Animal behaviour refers to any action an animal performs in response to its environment. Identify some of the actions that may indicate abnormal behaviour.

- (i) Aggressive movements
- (ii) Licking its fur
- (iii) Feather and body pecking
- (iv) Head nodding or shaking

Choose the correct combination:

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

1.1.4 A maintenance ration is the amount of food an animal requires to support ...

- A life as well as production.
- B life.
- C production.
- D life, production and work.

1.1.5 The Basic Conditions of Employment Act, 2001, addresses the following issues:

- A Labour peace and democracy
- B Advance in economic development
- C Working conditions for farm workers
- D Security to farm workers

1.1.6 Which production factor is needed in order to ensure maximum production?

- A Buildings
- B Labour
- C A middleman
- D Transport

1.1.7 A factor influencing the supply of a product:

- A Usage of the product
- B Buying power of consumers
- C Number of consumers
- D Increase in the price of the product

1.1.8 The structure that is responsible for hereditary characteristics in animals is the ...

- A mitochondrion.
- B Golgi's apparatus.
- C chloroplast.
- D chromosome.

1.1.9 A method of breeding used to develop hybrids is known as ...

- A cross-breeding.
- B line-breeding.
- C inbreeding.
- D upgrading.

1.1.10 The Nguni cattle breed was developed as a result of indigenous knowledge. The offspring of this cattle breed would have the following characteristics:

- (i) Very fertile
- (ii) Resistant to damage by ticks
- (iii) Development of fur during winter months
- (iv) Adaptability to extreme environmental conditions

Choose the correct combination:

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

(10 x 2) (20)

- 1.2 Choose a word from COLUMN B that matches a description in COLUMN A. Write only the letter (A – M) next to the question number (1.2.1 – 1.2.5) on the ANSWER SHEET, for example 1.2.6 N.

COLUMN A		COLUMN B	
1.2.1	The process by which male gametes are formed	A	extensive farming
1.2.2	Anaerobic pathogenic bacteria that secrete harmful poison or toxins	B	scientific knowledge
1.2.3	Knowledge used when erecting a fence from local materials, like branches of a thorn tree, to protect an animal enclosure	C	precision farming
1.2.4	The farmer produces just enough to sustain him and his family for one season	D	prepotency
1.2.5	When a hereditary characteristic in the parents is strongly visible in the offspring	E	subsistence farming
		F	spermatogenesis
		G	fertilisation
		H	<i>Nitrosomonas</i>
		I	copulation
		J	<i>Clostridium tetani</i>
		K	<i>Rhizobium</i>
		L	indigenous knowledge
		M	atavism

(5 x 2)

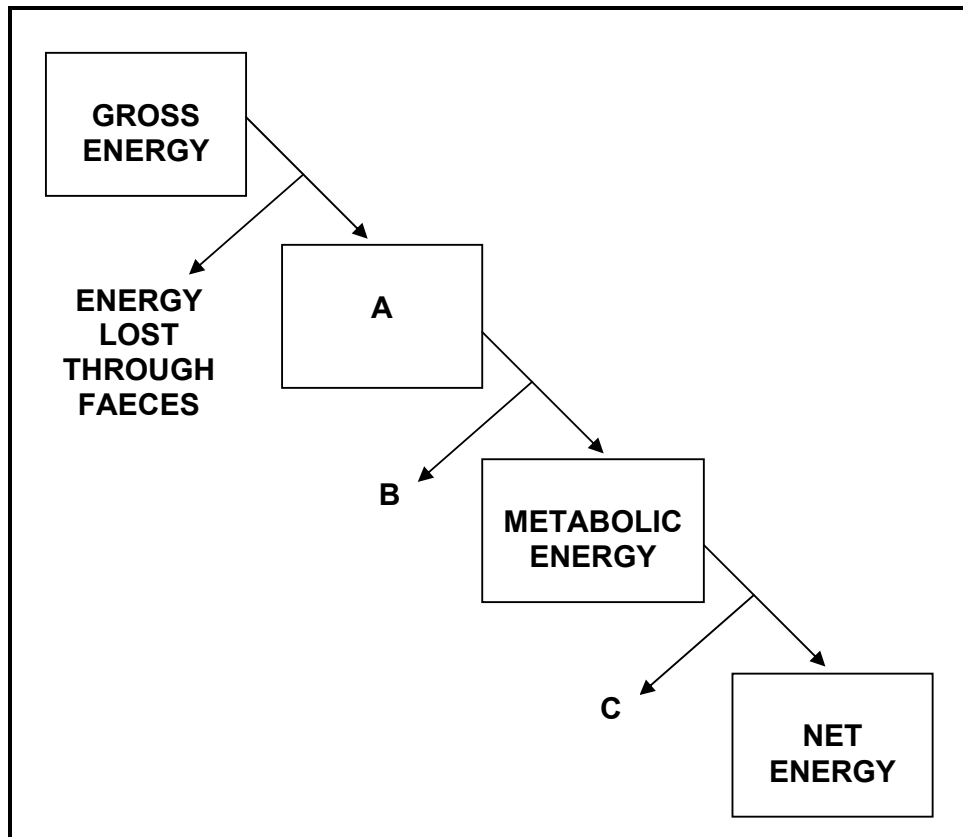
(10)

- 1.3 Give ONE term for each of the following descriptions. Write only the term next to the question number (1.3.1 – 1.3.5) on the attached ANSWER SHEET.
- 1.3.1 The type of temporary labour commonly used during peak periods on a farm
- 1.3.2 The structure found in the rumen of a calf by which milk is directly taken to the abomasum
- 1.3.3 The transformation of agricultural produce into a different product
- 1.3.4 Green fodder which is preserved and stored to preserve its moisture and volatile fatty acids
- 1.3.5 The method used in animal breeding to develop an identical replica of the parent animal, as was used to develop Dolly the famous sheep
(5 x 2) (10)
- 1.4 Change the underlined words in the following to make the statements TRUE. Write only the appropriate word(s) next to the question number (1.4.1 – 1.4.5) on the attached ANSWER SHEET.
- 1.4.1 Ascorbic acid is the substance found in the green plants from which vitamin A can be synthesised in the animal body.
- 1.4.2 A medication used specifically to kill bacteria and fungal infections is called vaccine.
- 1.4.3 Movable capital is the type of capital represented by a feed shed on a farm.
- 1.4.4 The cooperative system of marketing is used by chilli producing farmers who have decided to sell their produce through a single agent.
- 1.4.5 The translocation of a gene will lead to a new hereditary characteristic.
(5 x 1) (5)

TOTAL SECTION A: 45

SECTION B**START THIS QUESTION ON A NEW PAGE.****QUESTION 2**

2.1 Below is a schematic presentation of energy values of a feed.



Discuss the utilisation of energy in the ruminant body with specific reference to the factors represented by the letters A, B and C.

(5)

2.2

SCENARIO:

Mbizela has just received a dairy farm from his retired uncle, who planted legume pastures to supply feed for his dairy cattle, especially during the dry winter season. A week ago two of Mbizela's cattle were filled with gases and could not get rid of it. As a result they suffocated to death.

2.2.1 Which gases are produced in the alimentary canal of a ruminant that could lead to the occurrence of the above-mentioned condition?

(2)

2.2.2 What is this condition called?

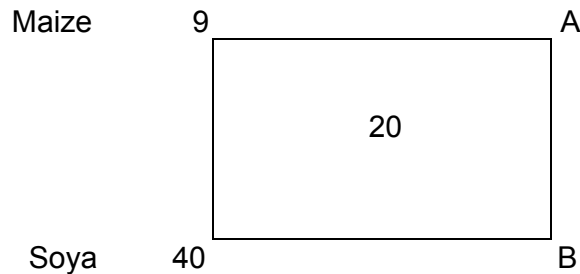
(1)

2.2.3 How can Mbizela prevent this condition from occurring in future? Give TWO solutions.

(2)

- 2.3 A farmer has maize and soya beans available to provide for a balanced ration for his dairy cows. They need 20% protein in their ration for milk production. Maize has a protein content of 9% and soya beans a protein content of 40%.

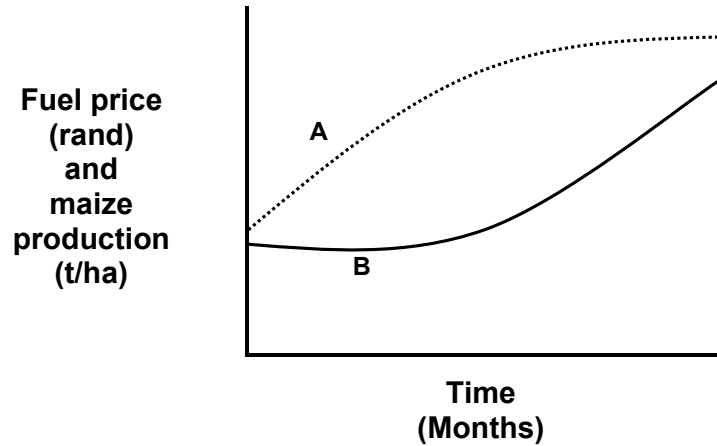
Use the square method below to calculate the answers to the questions that follow.



- 2.3.1 In what ratio should the available feeds be mixed to get the required protein value in the ration for the cows? (4)
- 2.3.2 Identify the above type of square method to calculate the feed mixture. (1)
- 2.3.3 Explain the nutritive requirements needed for these animals. (3)
- 2.4
- Role players have largely cautiously welcomed the cabinet's approval of the Draft Biofuels Industry Strategy. The strategy was approved in December 2006 and proposes a 4,5% biofuels market penetration of petrol and diesel in South Africa. This will assist to achieve 75% of the country's renewable energy target of over a billion litres of biofuels by 2013. According to Javonsky, this will create a new market for agricultural produce locally and internationally and he added: 'It will give the agricultural sector an opportunity to expand as a profitable industry.'

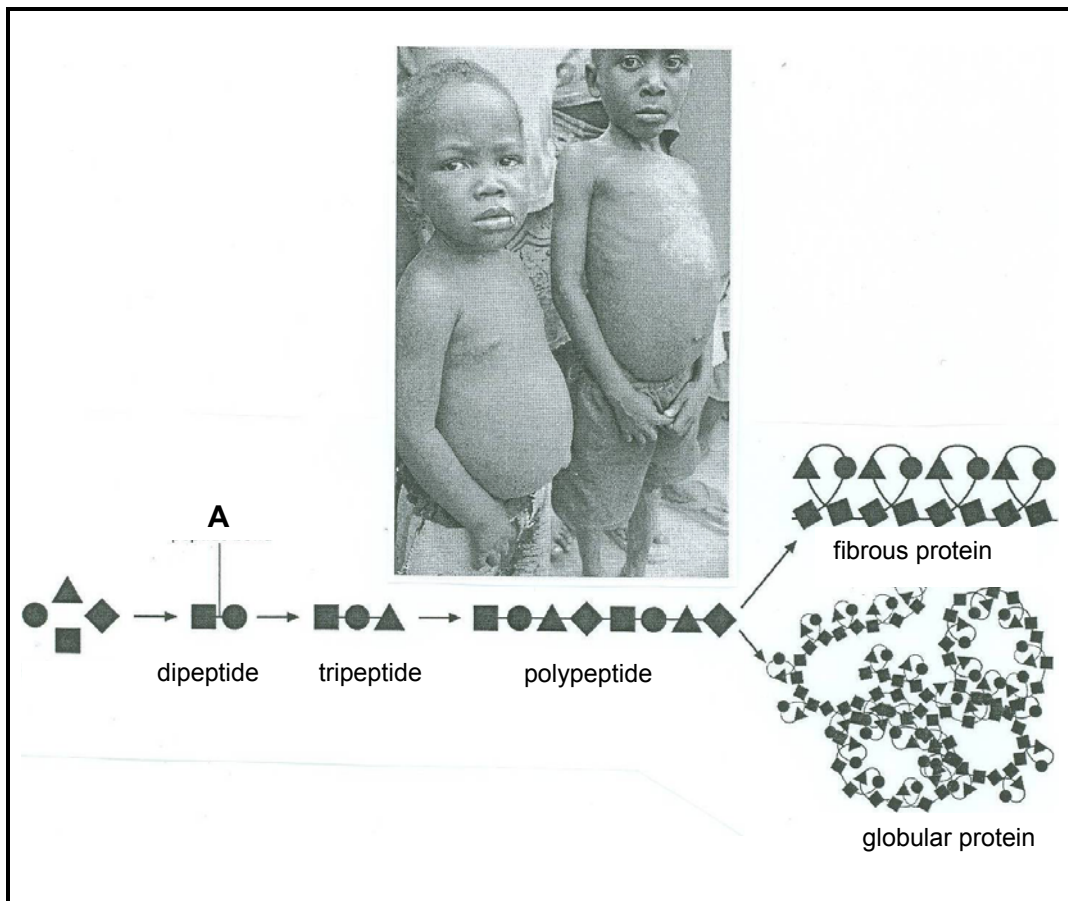
[Source: Unknown]
- 2.4.1 What does the above mean to ambitious and talented aspiring grain producers from previously disadvantaged communities? (2)
- 2.4.2 How will this affect the following?
- (a) Production levels of maize
- (b) The price of fuel (2)

- 2.4.3 The following graphic representation of fuel prices and maize production over time was made by an ethanol production company. They predicted that increases in the fuel price would stabilise over time.



- (a) Which graph represents the fuel price? Give a reason for your answer. (2)
- (b) How will an increase in maize production eventually influence the price of fuel and the price of maize? (2)
- 2.4.4 List TWO important entrepreneurial skills a farmer will need to engage successfully in such an endeavour. (2)

- 2.5 The following diagram represents the formation of proteins and shows children suffering from a nutritional disease.

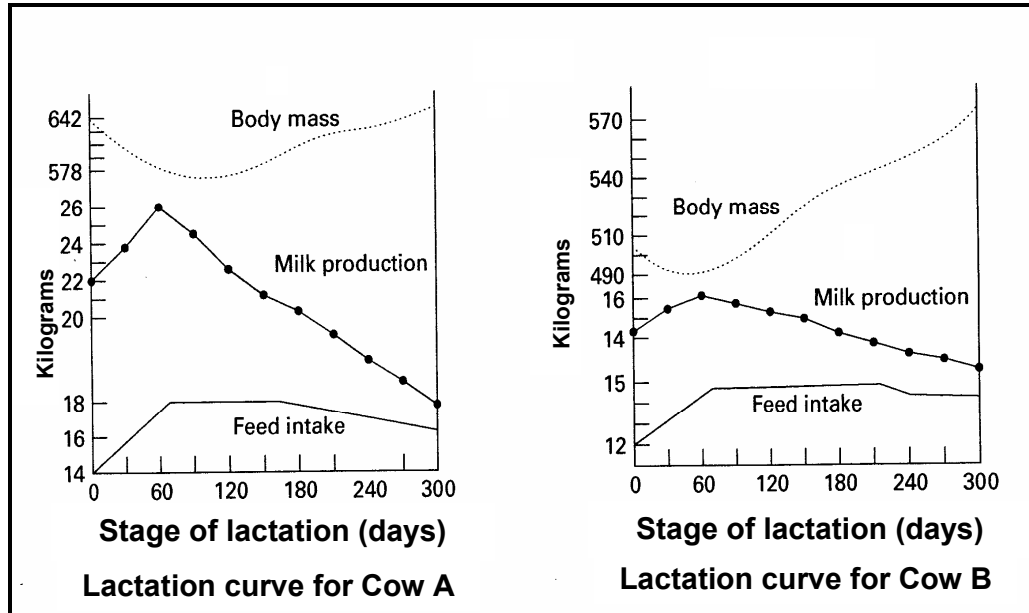


- 2.5.1 What are the building blocks of proteins called? (1)
- 2.5.2 Explain the meaning of a peptide bond as illustrated in the above diagram (labelled A). (2)
- 2.5.3 What is the difference between a *dipeptide* and a *polypeptide*? (2)
- 2.5.4 Identify the nutritional disease that the children in the above diagram are suffering from. How can this condition be prevented? (2)

[35]

START THIS QUESTION ON A NEW PAGE.**QUESTION 3**

- 3.1 Study the following two graphs which include the lactation curves for two cows (Cow A and Cow B).



- 3.1.1 Which of the two graphs represents the data for the cow with the higher selection index? Give THREE reasons for your answer. (4)
- 3.1.2 Which hormone is secreted by the gland in the brain and transported to the udder by the blood where it raises the pressure in the udder and forces the milk into the gland and teat cavities? (1)
- 3.1.3 A cow must dry up before the next lactation period starts. Support this statement by giving THREE reasons. (3)
- 3.2 The following list of structures are used in the handling of farm animals in animal production:

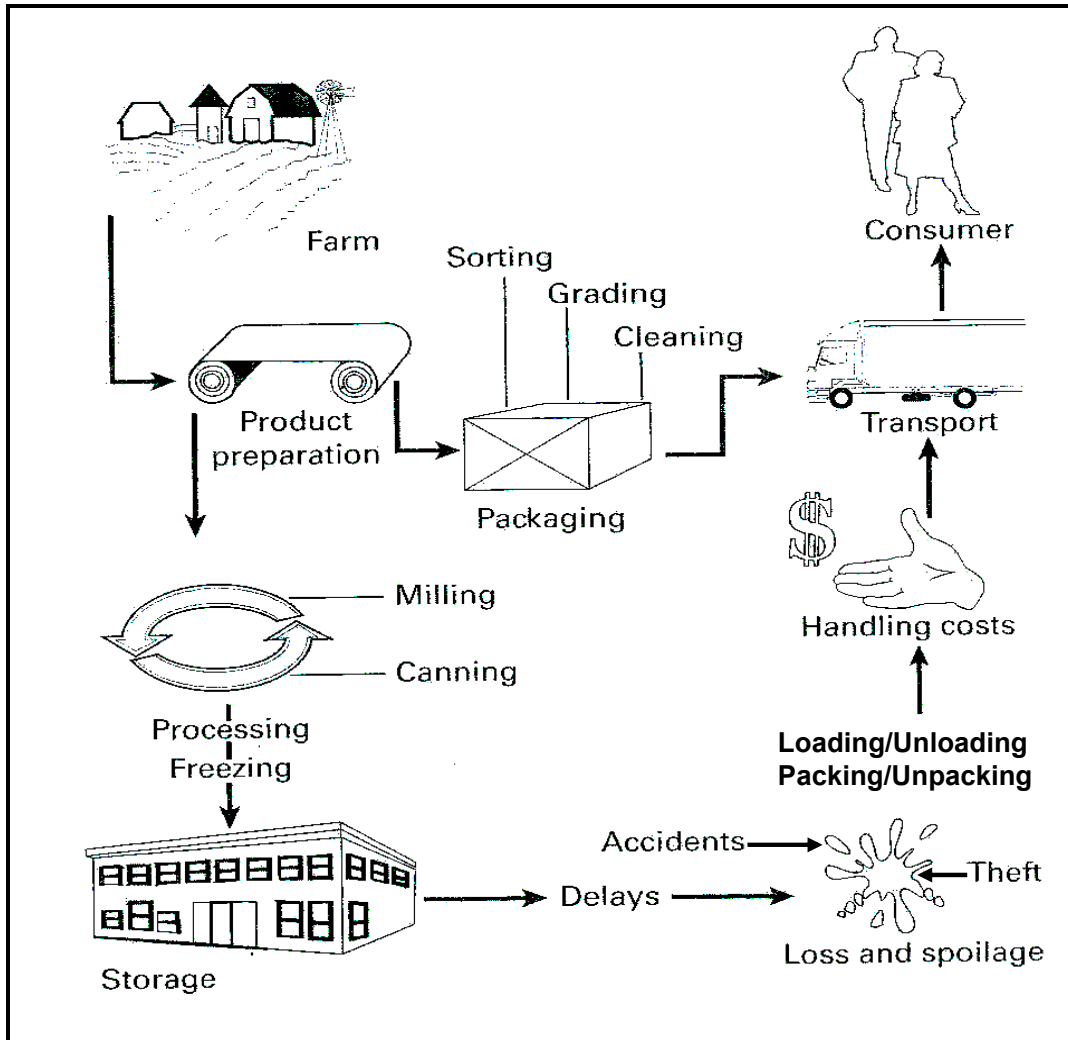
- A: A wire fence dividing grazing areas
- B: A wall built by stacking rocks
- C: A rope with a halter to tie an animal to a pole
- D: A single line of movable electrical fencing
- E: A traditional Zulu kraal made from sticks
- F: A temporary fence made from plastic

Indicate the structure which would be the most suitable for each of the following scenarios. Write down only the letter as indicated on the previous page and give a reason for your answer.

- 3.2.1 A suitable structure to be erected next to a busy road to keep animals from the road (2)
- 3.2.2 A temporary structure to control the daily grazing of dairy cattle on a pasture (2)
- 3.2.3 A structure that was used by indigenous people to control the movement of animals (2)
- 3.2.4 A temporary method to keep animals in a small area (2)
- 3.2.5 A sophisticated method to capture wild animals (2)

3.3 When goods are sold, a decision must be made with regard to the prices these goods will be sold for. Pricing them correctly is important for the success of any business.

Below is a flow diagram showing the stages in the marketing chain. Answer the following questions with reference to the diagram.



- 3.3.1 Briefly state why the prices at which the goods are sold at the farm differ from the prices at which they are sold in the market. (3)
- 3.3.2 Name TWO aspects to consider when goods are priced. (2)
- 3.3.3 Name TWO aspects mentioned in the above diagram that cannot be precisely budgeted for. (2)

3.3.4 You are a pork producer. For every kilogram of pork you produce you are paid R12,15. Local consumers pay R18,95 at supermarkets.

Calculate the price per kilogram that the consumers pay for the value adding and marketing of your product. (2)

3.3.5 Identify a risk factor from the above diagram that might influence the profitability of the enterprise. (1)

3.4 The following table reflects the fat content of pork measured at different slaughtering (marketing) stages.

Slaughtering stage (Months)	Total fat content (g fat/100 g meat)	Saturated fat (g fat/100 g meat)
3	2	1
6	4	2
9	6	3
12	8	4
15	10	5

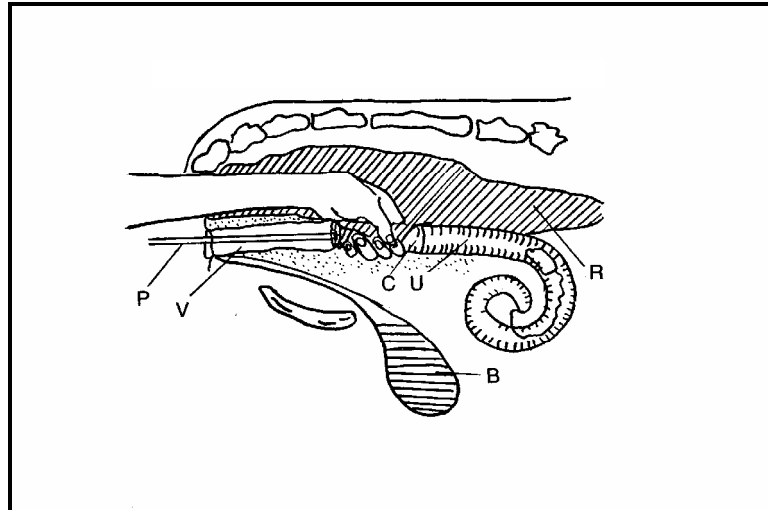
3.4.1 Draw a line graph to illustrate the increase in the total fat content of pork at different marketing stages. (4)

3.4.2 How much unsaturated fat is there in 100 g of pork slaughtered at an age of 6 months? (2)

3.4.3 Sunflower oil (plant oil) mainly contains unsaturated fats and is a liquid at room temperature. What effect does the saturated fat content of pork have on the melting point of fat? (1)
[35]

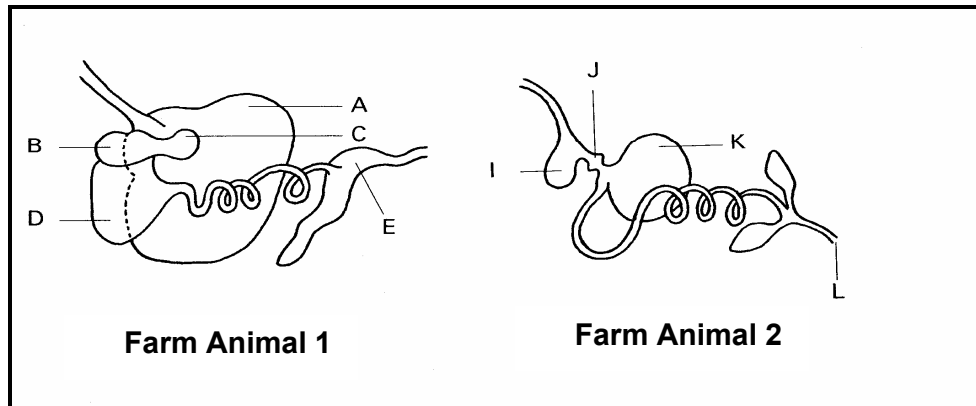
START THIS QUESTION ON A NEW PAGE.**QUESTION 4**

4.1 The diagram below shows the correct technique for artificial insemination.



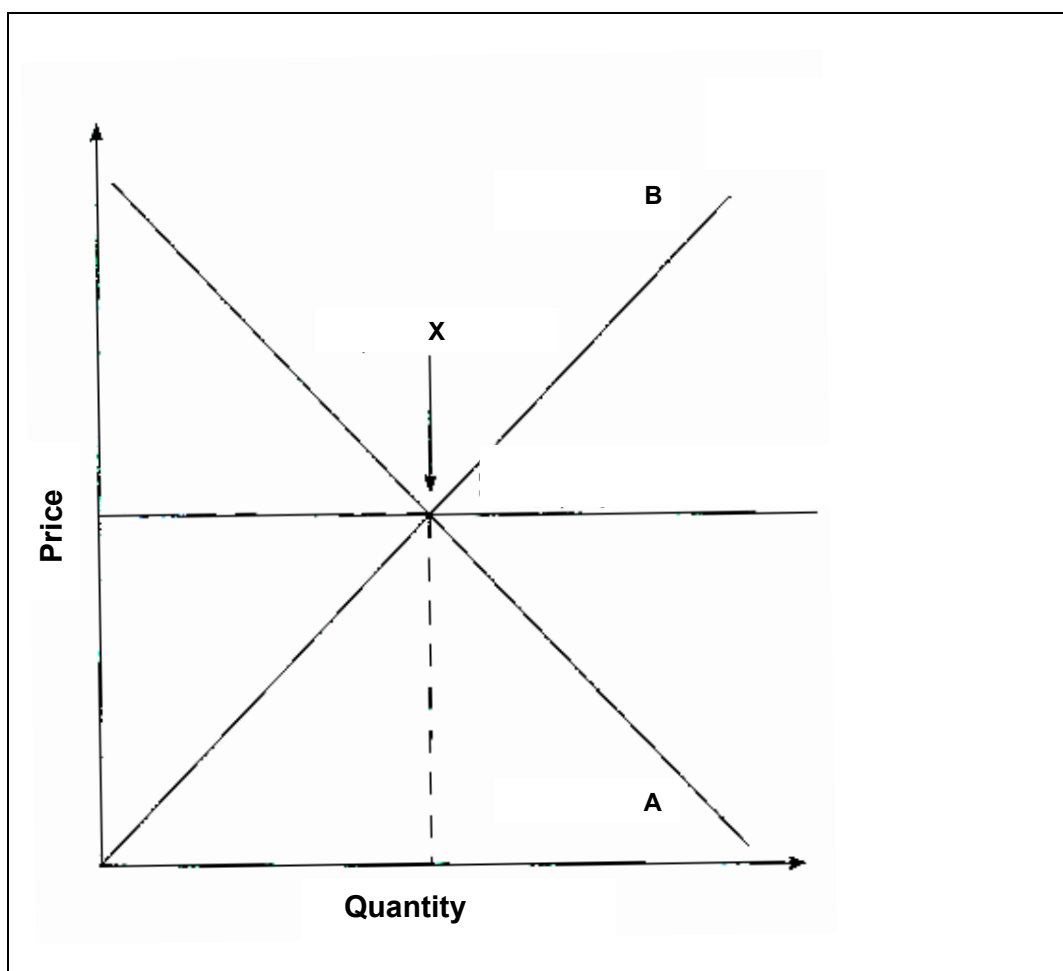
- 4.1.1 Identify the labelled parts P, V and B. (3)
- 4.1.2 Where is the semen placed during artificial insemination? (1)
- 4.1.3 Give a reason why the time at which signs of oestrus are observed is recorded. (1)
- 4.2 Some farmers plant areas to supply feed for their ruminant animals for optimum production and reproduction.
- 4.2.1 Identify the above-mentioned practice. (1)
- 4.2.2 Name a suitable crop for the above-mentioned practice. (1)
- 4.2.3 State TWO agricultural advantages of this practice. (2)

4.3 The following diagrams illustrate the alimentary canals of two farm animals.



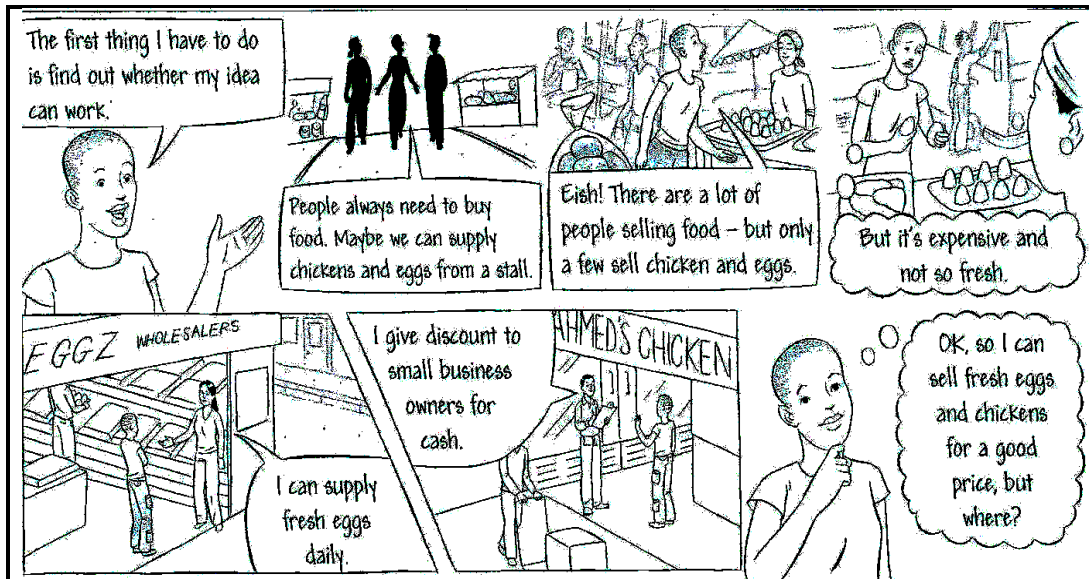
- 4.3.1 Identify each of the farm animals associated with the diagram indicated as Farm Animal 1 and Farm Animal 2. (2)
- 4.3.2 Compare the functions of the parts labelled A and I in the diagrams above. (2)
- 4.3.3 Draw a conclusion from the diagram above about the age level of Farm Animal 1. Give a reason for your answer. (2)
- 4.3.4 Describe TWO conditions in the part labelled A that are favourable for microbial activity. (2)

- 4.4 The following graph illustrates the supply and demand curves for milk production.



- 4.4.1 Identify the curves marked A and B respectively. (2)
- 4.4.2 How will the milk producers react when the price of the product increases? (1)
- 4.4.3 Name and discuss the situation at the point marked X on the graph above. (2)

4.5 Read the picture story with regard to Babalwa's marketing research.



- 4.5.1 Name TWO aspects that Babalwa paid attention to when she was conducting her research for a suitable market for the products she intends selling. (2)
- 4.5.2 State TWO principles Babalwa used to discover which products she should sell. (2)
- 4.5.3 Name and define the style or method of marketing she intends to use to sell her products. (2)

4.6 The following schematic representation indicates a crossing between black cows and a white bull. The herd of black cows has a similar but unknown genotype and the white bull has a homozygous recessive genotype. Black is the overall dominant characteristic.

Parents (first crossing)			
Phenotype:	Black cow	X	White bull
Genotype:	Unknown	X	bb
Offspring (F₁ generation)			
Phenotype:	50% is black and 50% is white		
Genotype:	50% Bb and 50% bb		

- 4.6.1 What is the genotype of the black cow in the schematic representation on the previous page? Motivate your answer. (3)
- 4.6.2 What type of animal breeding is used in this representation? (1)
- 4.7 The first GMO (genetically modified organism) crop to be grown commercially in South Africa was tomatoes which was introduced in 1994. Today many GMO crops are used for commercial production which includes maize, soya beans and canola. These crops are resistant to specific herbicides. Some maize, cotton and potato GMO cultivars are even resistant to insect pests.

The yield obtained by two maize farmers in a typical maize-growing area is shown in the following table. Farmer A used conventional hybrid seed and Farmer B changed to the latest available GMO seed.

Year	Yield (t/ha) (Farmer A)	Yield (t/ha) (Farmer B)
2000	10	10,2
2001	10,8	10,6
2002	9,6	12,0
2003	11,0	13,0
2004	10,4	15,0
2005	10,8	16,5

- 4.7.1 In what year did Farmer B change to GMO crops? Give a reason for your answer. (2)
- 4.7.2 Give the main reason why there is resistance against the use of GMO cultivars or breeds. (1)
- [35]**

TOTAL SECTION B: 105
GRAND TOTAL: 150

