

**GAUTENG DEPARTMENT OF EDUCATION  
SENIOR CERTIFICATE EXAMINATION**

**FEB / MAR 2006**

**AGRICULTURAL SCIENCE SG**

**TIME: 3 hours**

**MARKS: 300**

**REQUIREMENTS:**

- An approved (non-programmable) pocket calculator. Candidates must supply their own calculators.

**INSTRUCTIONS:**

- The examination paper consists of TWO sections.
- Answer ALL the questions.
- Answer Question 1A on the **answer sheet** on the **inside cover** of your **answer book**.
- Please use the same numbering system as in the paper.
- Please write neatly and legibly.

SECTION A

**QUESTION 1A  
MULTIPLE-CHOICE QUESTIONS**

Various possible answers are given for the following questions. Indicate the correct answer by making a cross (X) over the appropriate letter next to the question number on the **answer sheet** on the **inside cover** of your **answer book**.

**EXAMPLE:**

A	B	X	D
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**If more than one cross appears, no marks will be awarded.**

1.1 Bile is formed in the \_\_\_\_\_.

- A. gall bladder
- B. kidneys
- C. liver
- D. stomach

1.2 An adult cow has \_\_\_\_\_ incisors.

- A. 8
- B. 6
- C. 4
- D. 0

- 1.3 The part of the fowl's alimentary canal where small stones are found is the \_\_\_\_\_ .
- A. proventriculus
  - B. ventriculus
  - C. small intestine
  - D. rectum
- 1.4 The original source of all energy on earth is \_\_\_\_\_ .
- A. protein
  - B. lightning
  - C. sugar
  - D. sunlight
- 1.5 Which one of the following is **not** an economic characteristic of soil?
- A. Availability
  - B. Durability
  - C. Destructibility
  - D. Subject to the law of diminishing returns
- 1.6 A factor influencing the demand for a product is \_\_\_\_\_ .
- A. to sacrifice an expense
  - B. the number of consumers
  - C. knowledge
  - D. an increasing number of goods
- 1.7 Which of the following is an example of movable capital?
- A. Buildings
  - B. Silos
  - C. Machinery
  - D. Seed
- 1.8 A farming practice that supports the optimal utilization of resources of agricultural production is \_\_\_\_\_ .
- A. crop rotation
  - B. strip cultivation
  - C. over cropping
  - D. minimum tillage
- 1.9 A function of soil as a growth medium is that soil supplies \_\_\_\_\_ .
- A. raw material
  - B. food for human consumption
  - C. space
  - D. essential nutrients for plant growth

- 1.10 An example of a simple fruit is a/an \_\_\_\_\_ .
- A. raspberry
  - B. fig
  - C. plum
  - D. apple
- 1.11 The best method by which to produce strawberries is by making use of \_\_\_\_\_ .
- A. rhizomes
  - B. tubers
  - C. runners
  - D. grafting
- 1.12 The presence of this micro-element sometimes has a serious detrimental effect on the quality of water used for irrigation purposes.
- A. Boron
  - B. Molybdenum
  - C. Cobalt
  - D. Copper
- 1.13 The immediate end products of photosynthesis are \_\_\_\_\_ .
- A. alcohol
  - B. nucleic acids
  - C. fats
  - D. carbohydrates
- 1.14 The plant nutrient that enhances the green pigment in plants is \_\_\_\_\_ .
- A. nitrogen
  - B. phosphate
  - C. sodium
  - D. potassium
- 1.15 Which of the following characteristics is **not** obtained by cross-breeding?
- A. Greater viability
  - B. Better fertility
  - C. Genetic uniformity
  - D. Greater resistance to disease
- 1.16 Species crossing is the mating of \_\_\_\_\_ .
- A. two pure-bred animals of different breeds
  - B. two different species
  - C. two animals that are related to one another
  - D. a thoroughbred male animal with inferior females

- 1.17 Approximately how many hours does oestrus normally last in cows?
- A. 15
  - B. 18
  - C. 24
  - D. 2-3
- 1.18 The term used to indicate the mass per unit volume of soil is \_\_\_\_\_ .
- A. soil structure
  - B. pore space
  - C. total pore space
  - D. bulk density
- 1.19 A soil with a profile combination  $\begin{matrix} A \\ C \end{matrix}$  indicates that it is \_\_\_\_\_ soil.
- A. an adult
  - B. a young
  - C. an eroded
  - D. a wet
- 1.20 Soil colour is largely determined by \_\_\_\_\_ .
- A. climate
  - B. vegetation
  - C. minerals
  - D. horizon
- 1.21 Soil texture is determined by \_\_\_\_\_ .
- A. aggregates
  - B. particle size
  - C. climate
  - D. colour
- 1.22 Fully grown animals need a lot of \_\_\_\_\_ for fattening.
- A. proteins
  - B. vitamins
  - C. minerals
  - D. carbohydrates
- 1.23 Carbohydrates are stored in the liver in the form of \_\_\_\_\_ .
- A. glycogen
  - B. amylopectin
  - C. dextrin
  - D. glucose

1.24 Normal visual sharpness requires vitamin \_\_\_\_\_ .

- A. D
- B. A
- C. C
- D. B<sub>12</sub>

1.25 The sperm of a bull matures in the \_\_\_\_\_ .

- A. epididymis
- B. vas deferens
- C. seminal vesicles
- D. Cowper's gland

25x2= (50)

### QUESTION 1B

Supply the correct term/word for each of the following descriptions.

1.26 The phenomenon where the testes remain behind in the abdominal cavity

1.27 The ulceration and deformation of the cornea of the eye

1.28 The breaking down of fats into small droplets

1.29 The salivary glands under the tongue

1.30 The organ acting as a temperature control mechanism in the reproductive system of a bull

1.31 The downward movement of free water through soil by gravitation

1.32 The grouping of soil particles into aggregates

1.33 The application of fertilizers in strips on one or both sides of a row of plants

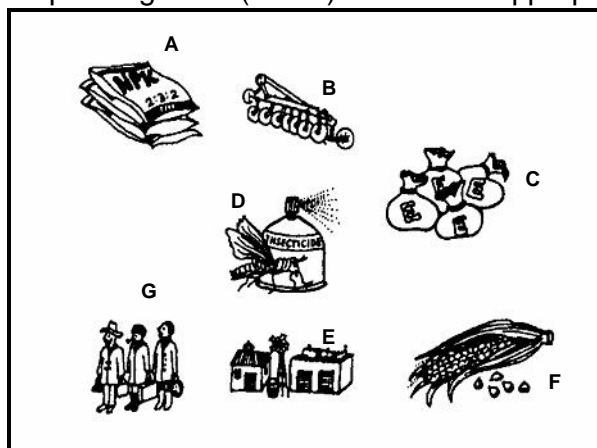
1.34 An instrument used to measure the tension of soil moisture

1.35 The removal of excess water from the soil by artificial means

10x2= (20)

### QUESTION 1C

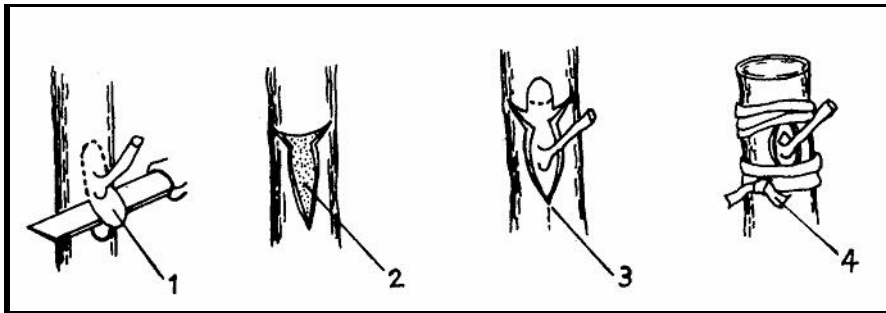
Study the illustrations below and choose the correct picture to fit the statements that follow. Write down only the corresponding letter (A – G) next to the appropriate question number.



- 1.36 Labour scarcity resulting from competition from industries and less pleasant working conditions on farms
- 1.37 Permanent durable asset
- 1.38 Medium-term credit is used for buying this
- 1.39 Needed for purchasing inputs
- 1.40 Temporary employees (5)

**QUESTION 1D**

Study the illustrations below and answer the questions that follow.



- 1.41 Identify the process illustrated by the diagrams above. (1)
- 1.42 Identify 1 to 4. (4)
- (5)**

**TOTAL FOR SECTION A: [80]**

SECTION B

QUESTION 2

2.1 Complete the table below by supplying the missing answers. Write down only the numbers (2.1.1 – 2.1.8) and the correct answer.

SYMPTOMS OF DEFICIENCY	ELEMENT DEFICIENCY	VITAMIN DEFICIENCY
Prolonged blood-clotting	2.1.1	2.1.2
Irritability or even degeneration of nerve cells	2.1.3	2.1.4
Decrease in the formation of haemoglobin molecules	2.1.5	2.1.6
Bent legs which cannot support body mass	2.1.7	2.1.8

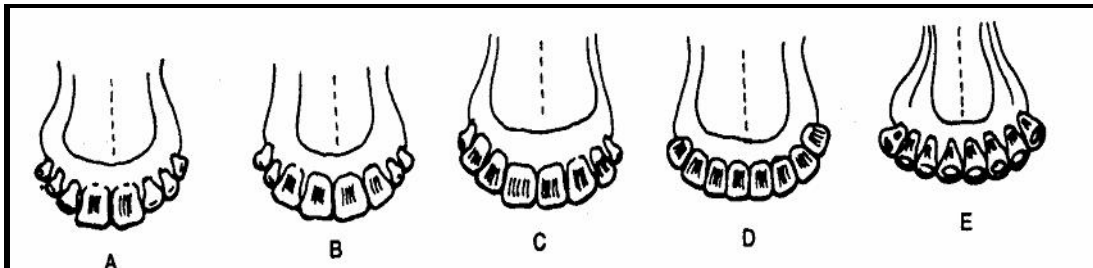
(8)

2.2 Answer the following questions on the importance of water for animals.

2.2.1 Name TWO sources from which a farm animal can obtain water. (2)

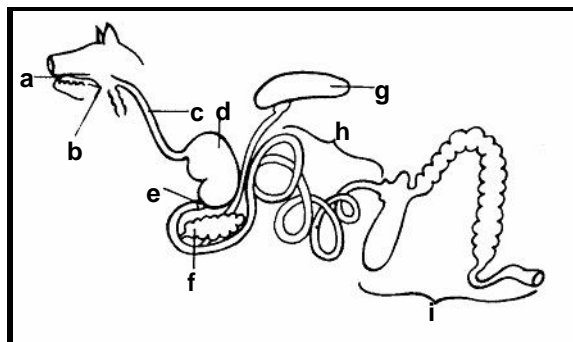
2.2.2 Name FIVE reasons why animals should have free access to water. (5)

2.3 Study the diagrams of a cow's teeth below and answer the question that follows.



2.3.1 Explain how a farmer can be guided by a cow's incisor teeth to estimate the age of the animal before it obtains a full mouth. (4)

2.4 Study the diagram below of the alimentary canal of a pig and answer the questions that follow.



2.4.1 Name the THREE glands found in part a. (3)

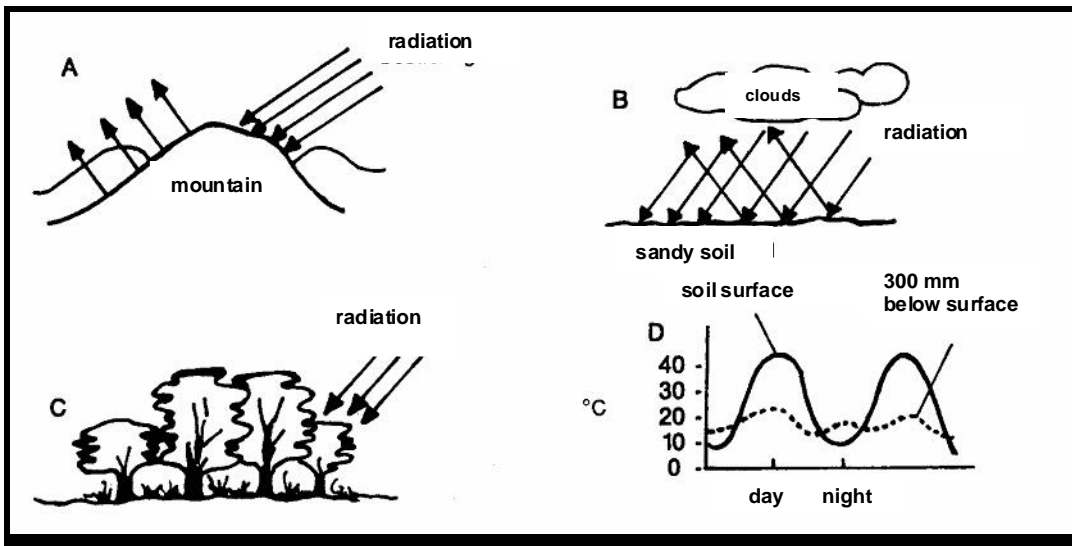
- 2.4.2 Name FOUR functions of saliva secreted by the glands mentioned in Question 2.4.1. (4)
- 2.4.3 Answer the following questions about the organ labelled **d**.
- (a) What do we call this type of stomach? (1)
- (b) Name THREE regions into which the stomach is divided. (3)
- (c) Name the antiseptic substance which is secreted by glands in the stomach. (1)
- 2.4.4 Name the secretion product of part **g**. (1)
- 2.4.5 Name TWO functions of part **i**. (2)
- 2.4.6 Name parts **c** to **g**. (5)
- 2.5 State SIX factors that influence the digestibility of feeds. (6)
- [45]**

### QUESTION 3

- 3.1 Name the forms of water loss that are prevented by the following:
- 3.1.1 Contour walls (1)
- 3.1.2 Eradication weeds (1)
- 3.1.3 A surface cover (1)
- 3.1.4 Controlled irrigation (1)
- 3.1.5 Cultivars with a small leaf surface in comparison to a large root system (1)
- 3.2 Explain the difference between **accessible** and **inaccessible water** and provide examples of both. (4)



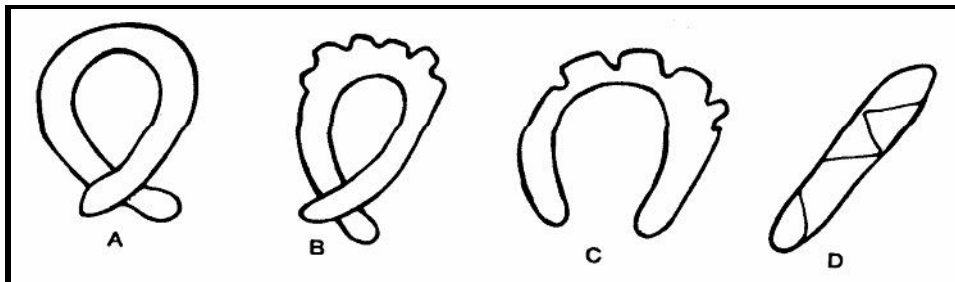
3.3 Study the factors illustrated below which influence soil temperature, and answer the questions.



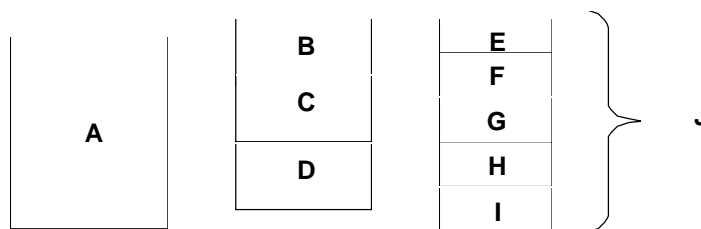
- 3.3.1 Identify factors **A** to **D**. (4)  
 3.3.2 List **FOUR** other factors that influence soil temperature. (4)

3.4 When it is impossible for a farmer to use laboratory tests to determine soil texture, he can do it by the so called 'field method'.

- 3.4.1 Briefly describe how the field method is done. (6)  
 3.4.2 Identify the texture classes of the following: (4)



3.5 Study the schematic representation of a soil profile and answer the questions that follow:

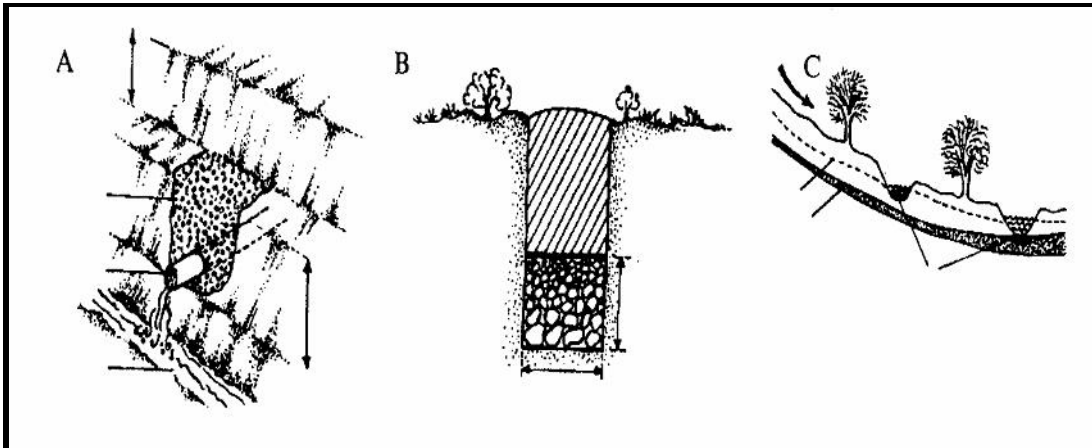


- 3.5.1 Identify the regions **E** to **I**. (5)

3.5.2 Define the following concepts:

- a) Soil profile (2)
- b) Soil horizon (2)

3.6 The diagram below illustrates three types of drains. Study the diagram and answer the questions that follow.

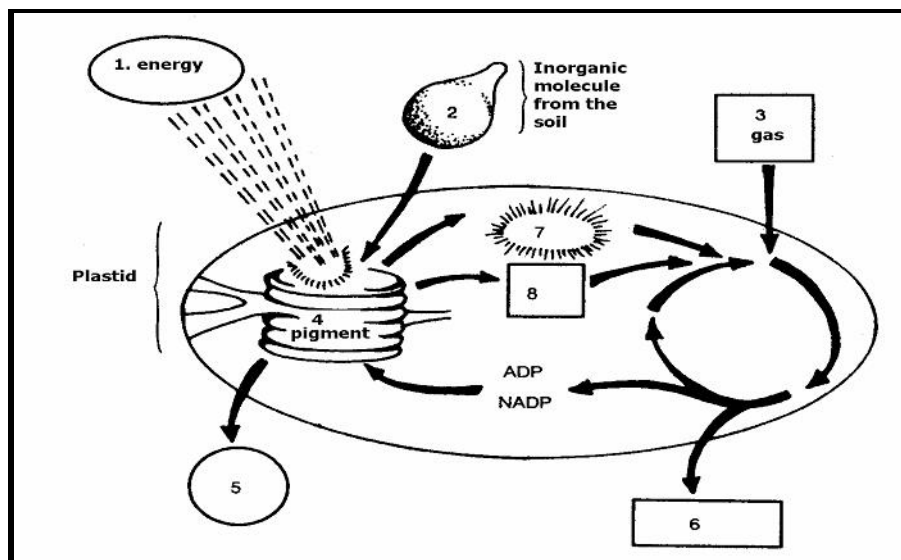


- 3.6.1 Identify the THREE types of drains numbered A to C. (3)
- 3.6.2 Define the concept **drainage**. (2)
- 3.6.3 List THREE advantages of open drains. (3)

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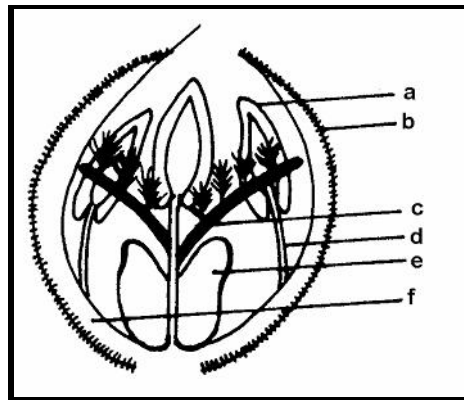
**QUESTION 4**

4.1 Study the diagram below and answer the questions that follow.



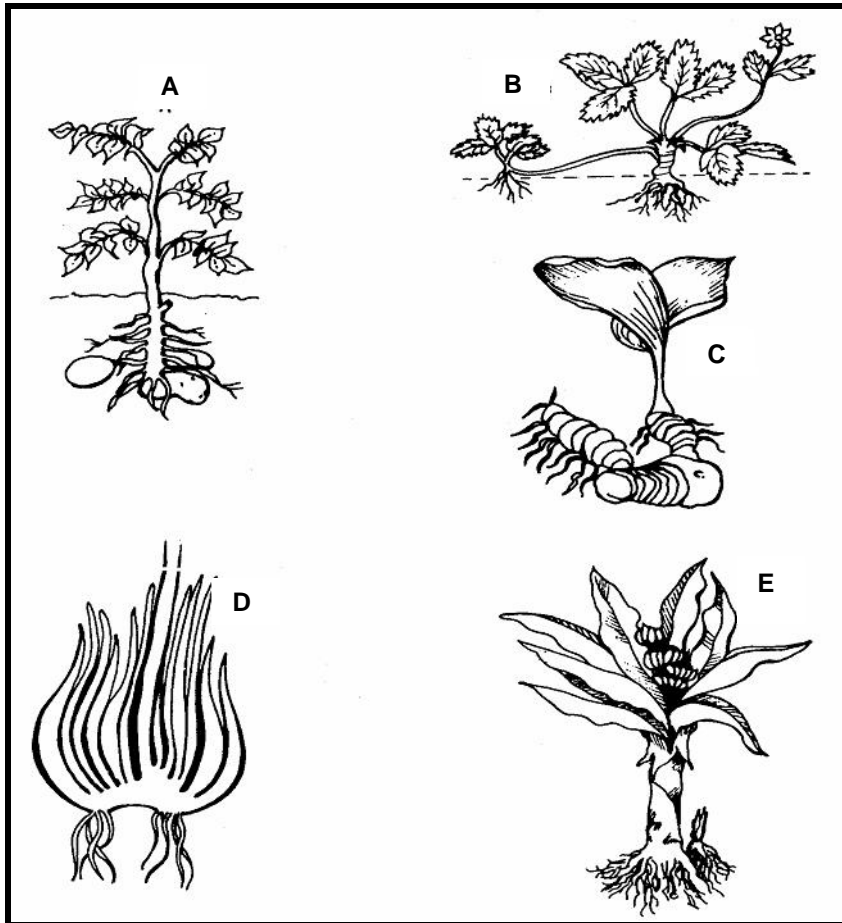
4.1.1 Name this process and indicate TWO ways through which it can be manipulated. (3)

- 4.1.2 Identify the plant plastid where the process takes place. (1)
- 4.1.3 Name the requirements of the process numbered 1 to 4. (4)
- 4.2 State FOUR reasons why phosphorus is an important plant nutrient. (4)
- 4.3 Write down the name of the phosphatic fertilizer suitable for use on
- 4.3.1 acidic soil. (1)
- 4.3.2 neutral to alkaline soil. (1)
- 4.4 A farmer bought one ton of superphosphate for R350,00. Calculate the unit value of the fertilizer per kilogram. Superphosphate contains 10,5% phosphate. (3)
- 4.5 Study the diagram below and answer the questions that follow.



- 4.5.1 Name the sex of the flower and give reasons for your answer. (3)
- 4.5.2 Identify the parts numbered a to f. (6)
- 4.5.3 Name FOUR differences between a **monocotyledonous** flower and a **dicotyledonous** flower. Write them down in tabular form. (8)

4.6 Study the following illustrations below and answer the questions that follow.



4.6.1 Identify the illustrated methods of asexual reproduction, labelled A to E. (5)

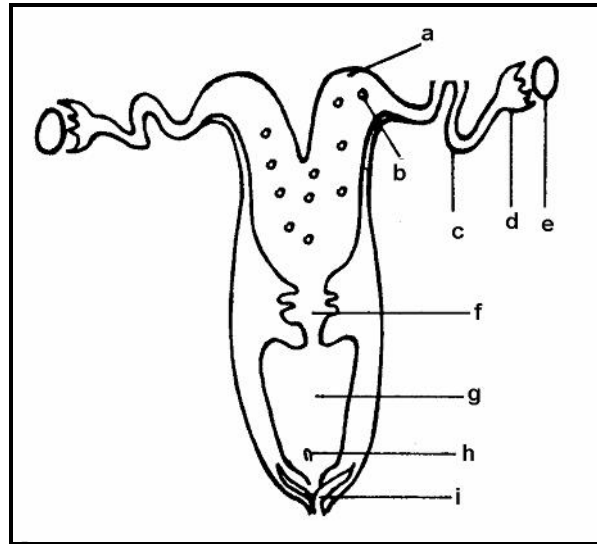
4.7 Define the following: (4)

- 4.7.1 Grafting
- 4.7.2 Artificial cross-pollination

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QUESTION 5

- 5.1 Study the following illustration of the partially opened reproductive tract of a cow, and answer the questions.

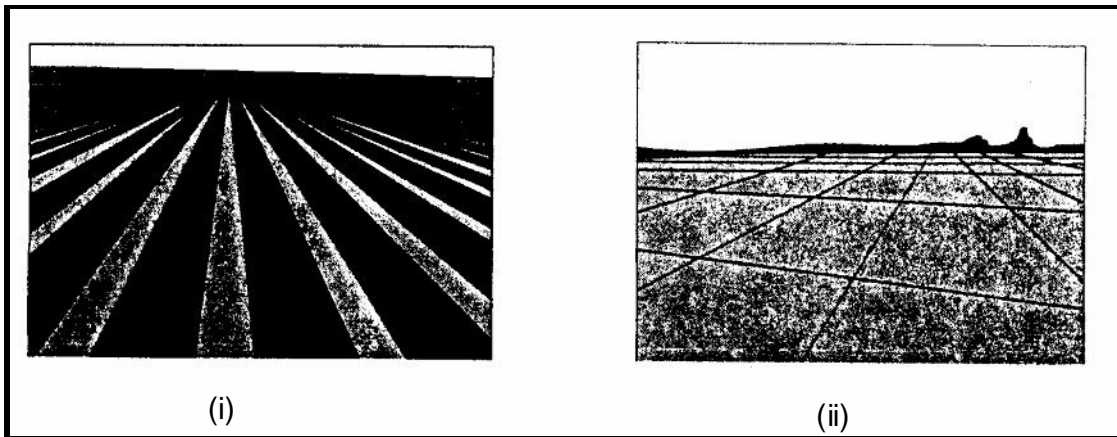


- 5.1.1 Identify the parts labelled a to i. (9)
- 5.1.2 Indicate the parts in Question 5.1.1 where the following occur/are found. Write down only the question number and the correct letter.
- (a) Placing of semen during A.I.
  - (b) The primary sex organ of a cow
  - (c) The place for fertilization
  - (d) The fingerlike projections
- (4)
- 5.2 Differentiate between **oestrus** and **pro-oestrus**. (8)
- 5.3 Various factors may lead to infertility among cows. List anatomical defects that may result in hereditary infertility in cows. (6)
- 5.4 State FIVE factors that may cause sterility in bulls. (5)
- 5.5 Name FIVE signs which indicate that a cow is about to give birth. (5)
- 5.6 A stock farmer often uses inbreeding as a method of breeding.
- 5.6.1 Define **inbreeding**. (2)
  - 5.6.2 How does inbreeding differ from line-breeding? (2)
  - 5.6.3 Name the advantages of inbreeding. (3)

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**QUESTION 6**

- 6.1 **Soil as an agricultural resource is of great importance.**  
List FOUR reasons why the above statement is true. (4)
- 6.2 Climate determines if a region is suitable for crop production. Name FIVE aspects of climate which influence crop production. (5)
- 6.3 State the FIVE main types of veld. (5)
- 6.4 Study the illustrations of an irrigation method and answer the questions that follow.



- 6.4.1 Name the irrigation method illustrated. (1)
- 6.4.2 Identify the TWO variations of this irrigation method. (2)
- 6.4.3 Provide
- (a) FOUR advantages and (4)
- (b) FOUR disadvantages of this irrigation method. (4)
- 6.5 Answer the following questions on crop rotation.
- 6.5.1 What is meant by the concept **crop rotation**? (1)
- 6.5.2 Name FOUR factors which a farmer should take into account in planning an effective system of crop rotation. (4)
- 6.6 List FIVE factors that contribute to soil erosion in South Africa. (5)
- 6.7 State FOUR production factors. (4)
- 6.8 State FIVE disadvantages of free marketing. (5)

[44]

**TOTAL FOR SECTION B: [220]**

**TOTAL: 300**

**END**