

WARNING

This Question Paper **MUST** be returned with your answer book at the end of the Examination:
otherwise marks will be lost.

M. 39

Write your Examination Number here



Coimisiún na Scrúduithe Stáit
State Examinations Commission

LEAVING CERTIFICATE EXAMINATION, 2005

AGRICULTURAL SCIENCE - ORDINARY LEVEL

FRIDAY, 24 JUNE – AFTERNOON 2.00 – 4.30

For the Superintendent use only

Centre Stamp

General Directions

THERE ARE TWO SECTIONS IN THIS EXAMINATION

Section One: **Six** questions must be answered.
Each question carries 20 marks.

Section Two: **Three** questions must be answered.
Each question carries 60 marks.

Total Marks: 300 marks

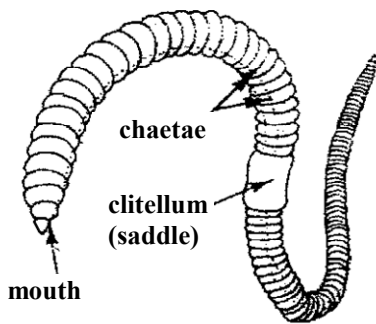
*You should not spend more than 45 minutes on Section One,
leaving 105 minutes for Section Two.*

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Instructions

- Answer **six** questions. Each question carries **20** marks.
- Write your answers in the spaces provided.
- Keep your answers short.
- Write your examination number in the space provided.

Question 1



- (a) Name this important animal in agriculture.

- (b) Name the phylum to which it belongs.

- (c) This animal is hermaphrodite. What does this mean?

- (d) Give **two** advantages of this animal in agriculture
- 1 _____
- 2 _____

(20 marks)

Question 2

In the case of **any two** of the animals, fill in the details in the table below.

	CATTLE	SHEEP	PIG
Length of gestation period (approx.)			
Weight of offspring when born (approx. kg)			
Normal age of animal at slaughter for meat production (approx.)			
Weight of animal at slaughter (approx. kg)			

(20 marks)

Question 3

Complete the spaces in the box below to show where in the animal body would you find the following parts.

Part of the body	Where it is found
Example: Radius	Forelimb
Retina	
Rumen	
Renal artery	
Rings of Cartilage	
Rectum	

(20 marks)

Question 4

(a) Name a grass normally used to make high quality silage in Ireland.

(b) What does dry matter digestibility (DMD) mean?

(c) What approximate value should high quality silage DMD be?

(d) What type of micro-organism helps to change grass into silage?

(e) Name an additive used in making silage. _____

(20 marks)

Question 5

Animal and plant cells are the basis of living organisms. The diagram shows a plant cell.

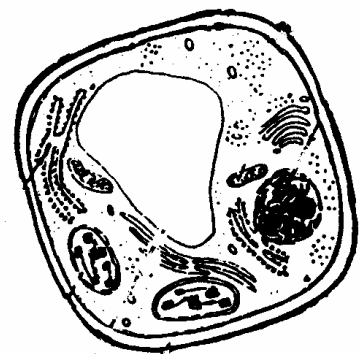
(a) Name **one** part found in **both** animal and plant cells.

(b) Name **one** part found in a plant cell and not found in an animal cell.

(c) Where in a cell is the DNA found?

(d) What part allows materials in and out of the cell?

(e) Name **one** dye used to stain a cell for examination under the microscope.



Question 6

The following practices are carried out on farms. Give a scientific explanation for each one.

(a) Crop rotation

(b) Earthing-up potatoes

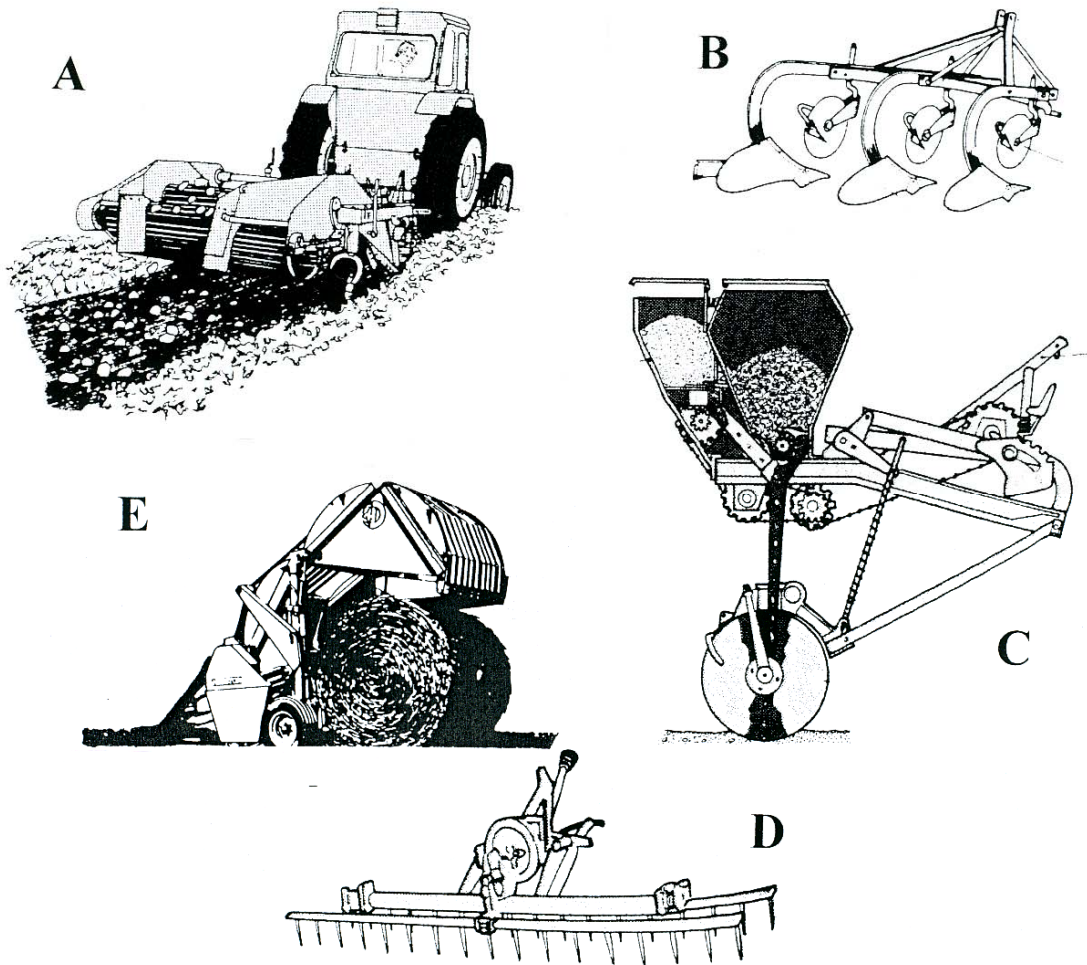
(c) Applying herbicide

(d) Mixed grazing

(20 marks)

Question 7

The diagrams below show machines used on farms. Match the labels on the diagrams with the name of the machine in the table below. Give the main function of each of the machines in the spaces provided.



Machine	Label	Used on the farm to:
Elevator Digger		
Combined Drill		
Plough		
Round Baler		
Harrow		

(20 marks)

SECTION TWO (180 marks)

Instructions

Write your answers to Section Two in your answer book.

Answer any **three** questions. Each question carries **60** marks.

Question 8

- (a) Application of slurry to soils is a common practice.
- (i) Give **two** benefits of spreading slurry on the land.
 - (ii) Name any **three** major mineral elements that you would find in slurry.
- (b)
- (i) Name an artificial nitrogenous fertiliser.
 - (ii) Why is nitrogen needed in plants?
- (c) When lime is added to the soil, it provides calcium. Give **two** other reasons for spreading lime.
- (d)
- (i) List **two** minor (trace) elements.
 - (ii) In the case of **one named** minor element, state why it is important in agriculture.

(60 marks)

Question 9

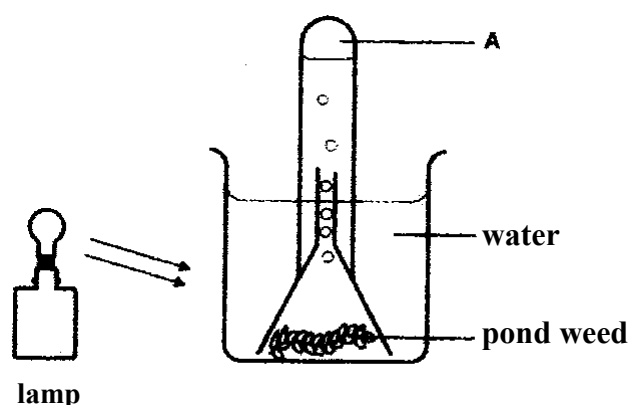
Answer any **two** parts (a), (b), (c), or (d).

- (a) Pollution is a problem associated with some agricultural practices.
- (i) Name **three** pollutants that are produced on farms.
 - (ii) In the case of **one** of them, explain how it pollutes the environment.
 - (iii) Outline how the risk of this pollutant getting into the environment can be reduced.
 - (iv) Explain why hedgerows are important in the countryside.
- (b)
- (i) Name **three** beef breeds.
 - (ii) What is meant by conformation in beef production?
 - (iii) What are the benefits of artificial insemination (AI) over natural service?
 - (iv) Name **one** disease of cattle and **one** method of prevention.
- (c)
- (i) Name **four** parts of the heart.
 - (ii) Explain the function of the heart.
 - (iii) Name **one** type of cell found in blood and give its function.
 - (iv) What is anaemia?
 - (v) How can anaemia be prevented?
- (d)
- (i) Soil is made up of many different sized mineral particles. Name any **four** of these.
 - (ii) Name **two** other non-living components of soil.
 - (iii) In the case of **one** of these, explain its importance.
 - (iv) Explain the process of flocculation.

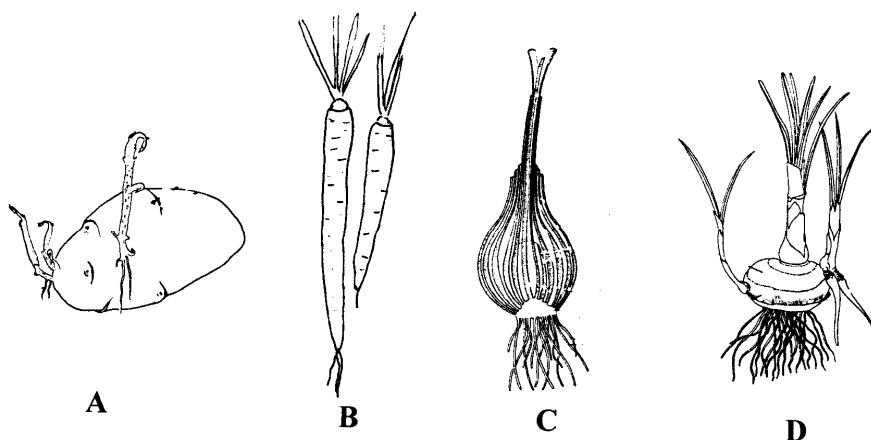
(60 marks)

Question 10.

- (a) The following experiment was set up to show that a gas is given off during photosynthesis.



- (i) Explain how to set up this experiment.
(ii) What result might you expect?
(iii) Name the gas that is released at A.
(iv) What test is used to find out what the gas is?
(v) Name **two** factors needed by plants for photosynthesis.
- (b) The diagram shows four modified food storage organs in plants
- (i) Name these **four** types of food storage organs.
(ii) Give an example, in each case, of plants that use these organs.
(iii) Name a food substance that is found in any **one** of these.
(iv) Describe a test for this food substance.
- (60 marks)**



Question 11

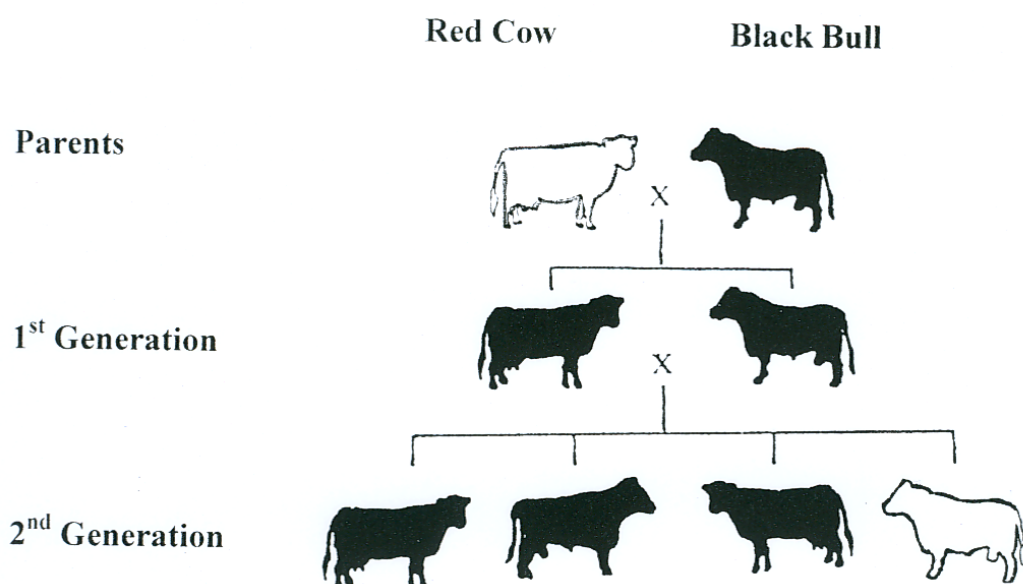
- (a) Meal concentrates are food supplements given to animals.
- (i) Name **two** food constituents found in concentrates.
(ii) In the case of a **named** constituent explain why it is added to foods.
(iii) In relation to food analysis what does dry matter (DM) mean?
(iv) Describe a laboratory procedure to find the dry matter content of a sample of silage.
- (b) In sheep production, concentrates are given at crucial times in the ewe's reproductive cycle. Explain the reasons for this and outline when the concentrates are given.
- (c) Outline the importance of colostrum (beestings) in the diet of a newborn lamb.
- (60 marks)**

Question 12

- (a) In relation to a **named** cereal **or** root crop you have studied, answer the following questions.
- Name **two** varieties of the crop.
 - Give **two** soil characteristics which make the soil suitable for this crop.
 - Outline how the soil is prepared for seed sowing.
 - When is the seed sown?
 - Name **one** pest or disease that affects the crop and outline how you would control it.
 - When is the crop harvested?
 - Describe how the crop is harvested.
- (b) Describe, with the aid of a labelled diagram, an experiment to examine the percentage germination of a sample of cereal seed. (60 marks)

Question 13

- (a) Coat colour in cattle is controlled by a gene, which has two forms (alleles). The diagram below shows the offspring of crosses between purebred Red Poll cows (red) with purebred Aberdeen Angus bulls (black).



- What letter is suitable to show the following alleles;
 - black coat colour?
 - red coat colour?
 - What is the genotype of the parent red cow?
 - What is the genotype of the parent black bull?
 - State the genotype of the first generation.
 - State the phenotype of the first generation.
 - What is the ratio of black to red animals in the second generation?
 - How many of the animals in the diagram are definitely homozygous for the gene for coat colour?
- (b)
- When using artificial insemination (AI), specific bulls are chosen to act as sires because of traits needed in the offspring heifers. What traits might these be?
 - As a result of developments in technology it is now possible to sex the semen of a bull. What does "sex the semen of a bull" mean in terms of the sex chromosomes?
 - What is the benefit of this technique to the farmer?

(60 marks)

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