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, 2006

AGRICULTURAL SCIENCE - ORDINARY LEVEL

FRIDAY, 23 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.

Blank Page

SECTION ONE (120 marks)

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 on the cover page.

Question 1

(a) Explain the term " **lactation period"**. _____

_____

(b) Before a dairy cow calves, she is "**dried off**" for a period.

(i) How long is she dried off for before calving?

_____

(ii) Give **one** reason why this happens. _____

_____

(c) Give **one** reason why colostrum is so important for the calf.

_____

(d) During the year, a farmer may have to keep some replacement heifers for milk production.
Give **one** reason why cows have to be replaced.

_____

_____

(20 marks)

[OVER

Question 2.

Match the words in Column A with the explanations in Column B and write the answers in Column C. The first has been completed as an example.

Column A	Column B	Column C
A. **Granite**	1. Mineral found in some rocks	**A = 4**
B. **Quartz**	2. A measure of the amount of water a soil can allow to flow through	
C. **pH**	3. A wet soil found in waterlogged conditions	
D. **Limestone**	4. An example of igneous rock	
E. **Gley**	5. A measure of the acidity of soil	
F. **Drainage**	6. An example of a sedimentary rock	

(20 marks)

Question 3

(a) Give **two** reasons why animals are housed during the winter months.

(i) _____

(ii) _____

(b) Describe, briefly, any **two** features of winter housing for cattle or sheep.

(i) _____

(ii) _____

(c) Name any **three** feedstuffs that a farm animal could be fed during this period.

(i) _____

(ii) _____

(iii) _____

(d) Explain the term "**store period".** _____

_____

(20 marks)

Question 4

(a) Name each plant shown in the photographs.

TH FOTO-WERBUNG/SCIENCE PHOTO LIBRARY

NIGEL CATTLIN/FLPA-images.co.uk

1. _____ 2. _____

(b) Name the plant family to which they belong.

_____

(c) Give **two** reasons why plant 2 is used in silage.

(i) _____

(ii) _____

(d) State **one** way you know plant 1 is ready for harvest

_____

(20 marks)

Question 5

Choose an illness/disease of farm animals from the following list and place it in column A to match the description in column B. The first one has been completed as an example.

Mastitis, bloat, orf, grass tetany, anaemia, foot and mouth

Column A **Illness/Disease**	**Column B** **Description**
Mastitis	Infection of the udder
	A viral disease that affects sheep
	Lack of iron in the blood
	Notifiable viral disease
	Build up of gas in the rumen
	Disorder caused by low levels of blood magnesium

(20 marks)

[OVER

Question 6

Give **<u>one function</u>** of each of these parts in the animal body:

(i) Kidney

_____

(ii) Ovary

_____

(iii) Testis

_____

(iv) Lung

_____

(v) Rumen

_____

(20 marks)

Question 7

"It is relatively easy to establish a good grassland sward but to maintain it requires good management".

(a) To ensure that the grassland sward is not over-grazed, farmers use different grazing systems.

(i) Name **one** of these systems. _____

_____

(ii) Give **one** reason why the system you have named is successful. _____

_____

_____

(b) State the main reason why clover is used in a grassland sward.

_____

(c) Name **two** minerals needed by the grassland sward during the growing season.

(i) _____

(ii) _____

(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) The photograph shows a leatherjacket, a pest of many cereal and root crops.

GEOFF KIDD/ SCIENCE PHOTO LIBRARY

(i) Describe **one** way that it damages crops.
(ii) Suggest **two** measures to control leatherjackets.
(iii) What does "**biological control"** mean?
(iv) Give **one** example of biological control of any pest.

(b) The photograph shows potato tubers affected by blight.

ASTRID & HANNS-FRIEDER MICHLER/ SCIENCE PHOTO LIBRARY

(i) What weather conditions help the spread of this disease in the potato crop?
(ii) Which type of organism causes this disease?
(iii) Describe **two** ways in which the disease affects the potato plant.
(iv) Give **two** ways that this disease can be controlled.

(60 marks)

[OVER

Question 9

(a) Name **two** breeds of each of the following
(i) Pig (ii) Sheep (iii) Beef animal (iv) Dairy animal.

(b) In the case of **one named** breed of any one animal, state **two** characteristics of the breed.

(c) If you want to produce high quality food from animals, the management of animal health is important. State **four** ways that you can keep animals healthy.

(d) Explain "**condition scoring"** in regard to animals.

(e) State **four** precautions that should be taken when buying in animals.

(60 marks)

Question 10.

Answer any **two** parts, (a), (b), (c), (d). (30, 30)

(a) A number of environmental factors are needed for seeds to **germinate**.
(i) What does "**germination"** mean?
(ii) Name **three** factors needed for germination.
(iii) Describe, with the aid of a labelled diagram, an experiment to investigate percentage germination of a sample of seeds.

(b) When plants are growing, substances move through them.
(i) Explain what "**transpiration"** is.
(ii) What is meant by "**osmosis"**?
(iii) Describe, with the aid of a labelled diagram, a laboratory experiment to demonstrate osmosis.

(c) **"Respiration"** is the controlled release of energy in a living cell.
(i) What gas is released by plants in respiration?
(ii) Does respiration happen (a) in daylight (b) in darkness or (c) all the time?
(iii) Describe with the aid of a labelled diagram, a laboratory investigation to show that seeds give off **heat** in respiration**.**

(d) Plants use sunlight to make food during "**photosynthesis"**.
(i) What is the main gas released in photosynthesis?
(ii) Name the major pigment needed by plants for photosynthesis.
(iii) Describe with the aid of a labelled diagram, a laboratory investigation to show that light is needed for **photosynthesis**.

(60 marks)

Question 11

(a) There are 46 chromosomes in a human somatic (body) cell. How many chromosomes are there in a human gamete?

(b) Name the process by which a cell divides into two identical cells.

(c) The photograph shows a scientist who carried out the early research on inheritance. Name this man.

NATIONAL LIBRARY OF MEDICINE/ SCIENCE PHOTO LIBRARY

(d) Why is the fruit fly (*Drosophila*) commonly used in genetic experiments?

(e) In pea plants, tall stem (**T**) is dominant over dwarf stem (**t**). A pure breeding tall pea plant was crossed with a dwarf plant.

(i) Copy the following into your answer book and complete the spaces (genotypes in brackets, phenotypes on lines) to outline the following cross.

The genotypes of the original parents	(**TT**)	X	(**tt**)
The gametes produced by each parent	( )	X	( )
The genotype of the offspring (F1)		( )	
The phenotype of the offspring (F1)		_____	

(ii) The offspring of the above cross were crossed with dwarf plants. Copy the following into your answer book and complete the spaces (genotypes in brackets, phenotypes on lines) to outline this cross.

The genotypes of the second generation parents	( )	X	( )
The gametes produced by each parent	( ) ( )	X	( ) ( )
The genotypes of the second generation	( )		( )
The phenotypes of the second generation	_____		_____

(60 marks)

[OVER

Question 12

(a) Compare **sandy** soils and **clay** soils under the following headings:
- (i) Size of particles
- (ii) Drainage
- (iii) Mineral content
- (iv) Organic matter.

(b) Describe **three** methods to improve the **structure** of a soil.

(c) Outline the influence of soil **texture** on crop growth.

(d) Give **two** benefits of adding slurry to the soil.

(e) Name **two** artificial fertilisers and state what nutrient element each one supplies.

(60 marks)

Question 13

Discuss the growing of a **named** cereal OR a **named** root crop under the following headings:
- (i) Rotation.
- (ii) Soil suitability.
- (iii) Pre-sowing cultivations.
- (iv) Nutrition.
- (v) Choice of variety.
- (vi) Time, rate and method of seed sowing.
- (vii) Weed control.
- (viii) Target yield.

(60 marks)

Blank Page

Blank Page