WARNING

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

Write your Examination Number here ⇨

Coimisiún na Scrúduithe Stáit
State Examinations Commission

LEAVING CERTIFICATE EXAMINATION, 2009

AGRICULTURAL SCIENCE - ORDINARY LEVEL

THURSDAY, 18 JUNE – MORNING 9.30 – 12.00

For the use of the Superintendent only

Centre Stamp

General Directions

THERE ARE TWO SECTIONS IN THIS EXAMINATION PAPER

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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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 page 1.

Question 1.

The diagram is of a liver fluke (*Fasciola hepatica*) an organism that occurs in the liver of some farm animals.

(a) Name **two** farm animals in which liver fluke can be found.

(i) _____

(ii) _____

(b) State **two** symptoms an animal would have if infected with liver fluke.

(i) _____

(ii) _____

(c) How can the farm animal be treated immediately for the liver fluke infection?

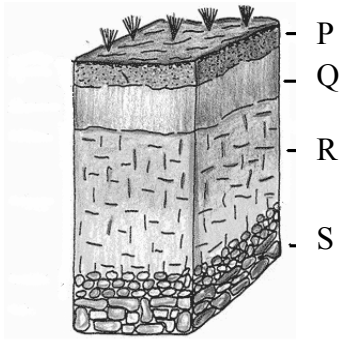
_____

_____

(20 marks)

[OVER]

Question 2.

The diagram shows the soil profile of a podzol. Name the parts P, Q, R, S. P: _____ Q: _____ R: _____ S: _____	

Describe a suitable activity that would remove the iron pan in a podzol.

_____

(20 marks)

Question 3.

The following apparatus are used in habitat studies

A

B

(a) Name the two pieces of equipment labelled A and B.

A _____ **B** _____

(b) What is the function of B in a habitat study?

_____

_____

(c) State **two** characteristics which help to identify a grass when carrying out a habitat study.

(i) _____

(ii) _____

(20 marks)

Question 4.

Four samples of milk were tested to determine their hygienic quality. The results of the tests are given below.

1. Blue

2. Pink

3.White

4. Mauve/Lilac

(a) Give the name of a chemical dye that is added to milk to test its hygienic quality.

_____

(b) What causes contamination of milk?

_____

(c) State **one** way that contamination of milk in the milking parlour can be reduced.

_____

(d) Which of the above samples is the poorest quality milk?

_____

(20 marks)

Question 5.

Many diseases of plants and animals are caused by a lack of a particular element in the soil or in the animals' diet. In the table below match each element to the deficiency disease that is caused by a lack of that element. The first one has been completed as an example.

1. Calcium 2. ~~Boron~~ 3. Iron 4. Copper 5. Cobalt 6. Magnesium

Deficiency Disease	**Element**
Heart rot in sugar beet	Boron
Swayback in sheep	
Anaemia in pigs	
Grass tetany in cattle	
Milk fever in cattle	
Pine in sheep	

(20 marks)

[OVER]

Question 6.

Soil is analysed to determine whether or not fertiliser is required for growing crops. A number of activities are carried out when sampling and analysing soil.

(a) Why are the samples taken in a W-shaped pattern?

_____

(b) List **two** parts of a field which should be excluded from sampling.

(i) _____

(ii) _____

(c) Name **one** mineral for which the soil samples are tested.

_____

(d) What is meant by the term *soil pH*?

_____

(20 marks)

Question 7.

Criss-cross breeding is a technique carried out in the breeding of pigs.

(a) State **two** advantages of criss-cross breeding.

_____

_____

(b) Why do boars need to be replaced every two years in this type of enterprise?

_____

(c) State **one** advantage of an integrated pig production unit.

_____

(d) State the approximate average weight in kilograms at birth of a bonham (piglet).

_____

(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) (i) Name **two** breeds of cattle used in dairy farming.
(ii) Many calves die in the first week of life. List **two** management practices for successful calving.
(iii) State **one** way in which a farmer can ensure a cow will reach her peak milk yield.

(b) Calves are often grazed in the leader-follower system.
(i) What is the leader-follower system of grazing?
(ii) Give **two** reasons why calves are grazed in this way.
(iii) Cattle are housed for the winter in November. What is the ideal target weight for spring-born calves being housed for their first winter?
(iv) What measures can farmers take to ensure that underweight calves make an improved weight gain indoors?

(c) (i) What is mastitis?
(ii) State **one** symptom of mastitis.
(iii) Describe **two** ways of preventing mastitis in dairy cattle.

(60 marks)

Question 9.

(a) (i) Describe **two** advantages of crop rotation.
(ii) List **three** methods of weed control in tillage crops.
(iii) Name an insect pest of a cereal crop.
(iv) How does the pest you have named damage the crop?
(v) What is the difference between a selective herbicide and a total herbicide?

(b) (i) Name a fungal disease of plants **and** name the crop which it affects.
(ii) List **two** symptoms of the disease in the crop named in part (b) (i).
(iii) Describe **one** method of preventing this disease.
(iv) Name a beneficial activity carried out by micro-organisms in soil.

(60 marks)

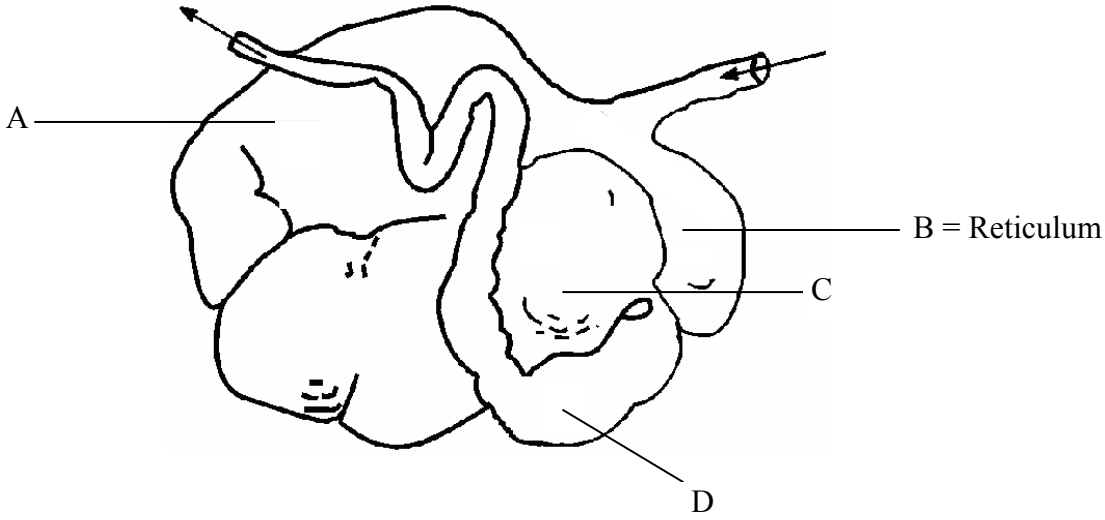
[OVER]

Question 10.

(a) (i) Name **two** breeds of sheep used in mountain sheep production.
(ii) Name **two** breeds of sheep used in lowland sheep production.
(iii) Describe the main practices involved in either a mountain sheep enterprise or a lowland sheep enterprise.

(b) (i) Sheep are polyoestrous. What does the term *polyoestrous* mean?
(ii) What is the length of the oestrous cycle in sheep?
(iii) Describe the key steps involved in 'breeding out of season' to produce lambs for the early spring market.
(iv) State a suitable ram-to-ewe ratio that should be used for mating when breeding out of season.

(c) Sheep are ruminant animals.
(i) The diagram below represents the ruminant stomach. Name the parts labelled A, C and D. Part B has been named for you.



(ii) Part A holds a large number of micro-organisms.
What is the main function of these micro-organisms?
(iii) What is the function of part C in the diagram?

(60 marks)

Question 11.

(a) Describe the cultivation of a **named** cereal crop under the following headings:

(i) Soil type
(ii) Sowing
(iii) Fertiliser
(iv) Harvesting.

(b) List **three** advantages of using certified seed in the cultivation of cereal crops.

(c) Describe an experiment to show the germination rate of a certified seed sample.

(60 marks)

Question 12. **(30, 30)**

Answer any **two** of the following parts (a), (b), (c), (d).

(a) Silage is an important winter feed for livestock.

(i) Name **one** grass suitable for the production of silage.
(ii) Describe **three** procedures carried out in the production of pit silage.
(iii) State **three** advantages of the use of 'round bales' in silage production.

(b) Beef animals are housed indoors during the winter months.

(i) List **three** housing requirements for weanlings housed in their first winter.
(ii) Animals kept indoors during the winter undergo compensatory growth in the summer. Explain the term *compensatory growth*.
(iii) State **two** conformation characteristics which are desirable in beef animals.
(iv) Why are most beef animals slaughtered at 2 years?

(c) Agricultural Science students study the general structure and function of plants.

(i) Describe the functions of xylem tissue **and** phloem tissue.
(ii) Explain the difference between transpiration and translocation.
(iii) Describe an experiment to show water movement in a plant stem.

(d) Give a scientific explanation for **each** of the following:

(i) The production of carbon dioxide (CO_2) in the animal body.
(ii) The thinning of trees in forest tree production.
(iii) The earthing-up of potatoes.
(iv) The addition of clover seed to a grass seed mixture for a pasture sward.

(60 marks)

[OVER]

Question 13.

(a) (i) Where are chromosomes found in a cell?
(ii) What type of cell division leads to a reduction in chromosome number?
(iii) What term is used to describe the number of chromosomes in a sex cell?

(b) State **three** advantages of using fruit flies (*Drosophila*) for genetics experiments.

(c) In poultry the allele for feathered legs (F) is dominant over the allele for clean legs (f).

Explain the terms *dominant*; *alleles.*

Copy the following into your answerbook and complete the cross by filling in the spaces to show the possible gametes, genotypes and phenotype.

The genotypes of the parents	(FF)	x	(Ff)
The gametes produced by each parent	( )	x	( ) ( )
The genotypes of the offspring	( )		( )
The phenotype of the offspring	_____		

(d) (i) What is the difference between performance testing and progeny testing?
(ii) AI is a technique often used in cattle breeding. What does AI stand for?
(iii) List **three** advantages of using AI for breeding.

(60 marks)

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