

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 

AN ROINN OIDEACHAIS AGUS EOLAÍOCHTA

—————
LEAVING CERTIFICATE EXAMINATION, 2002
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AGRICULTURAL SCIENCE - ORDINARY LEVEL

Wednesday, 12 June - Afternoon 2.00 to 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.*

Section One

(120 marks)

Instructions

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

Question 1

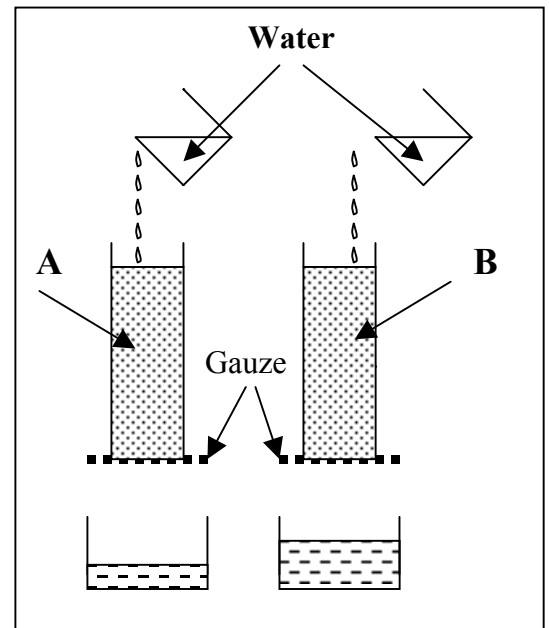
The diagram shows an experiment set up to show the permeability of two different soil samples.

- (a) Which of the soils **A** or **B** is more permeable?

- (b) How would this experiment tell which soil is more permeable?

- (c) What would increase the permeability of a soil?

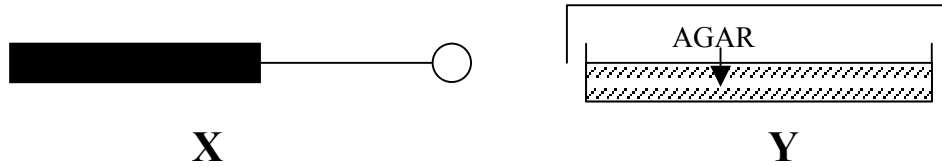
- (d) Name **one** type of sedimentary rock.



(20 marks)

Question 4

The following equipment was used in an investigation to show the presence of bacteria in a sample of milk.



(a) Name the two pieces of equipment **X** and **Y** used in the experiment.

X _____

Y _____

(b) What are the functions of **X** and **Y** in the investigation?

X _____

Y _____

(c) What result would you expect if bacteria were present in the milk?

(d) How is **X** sterilised during the investigation?

(20 marks)

Question 5

The main product of the sheep industry in Ireland is meat.

(a) State **two** other products of the sheep industry.

1 _____ 2 _____

(b) Name **two** breeds of sheep found in Ireland.

1 _____ 2 _____

(c) Describe **two** characteristics for any **one** of the named breeds in part (b).

1 _____

2 _____

(d) What is meant when a ewe is referred to as "culled-for-age", "draft" or "cast"?

(20 marks)

Question 6

(a) The diagram shows the flower of a grass plant.
Name any **two** grasses found in Ireland.

1 _____

2 _____

(b) Flower head type can help in the identification of grasses.

State **two** other characteristics, which help in the identification of the grass.

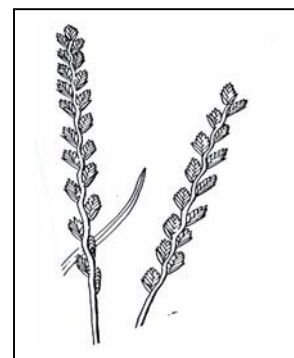
1 _____

2 _____

(c) State **two** methods of sowing grass.

1 _____

2 _____



Taken from Grasses. C.E. Hubbard.
Penguin books, England.

(20 marks)

Question 7

Complete the following:

- (a) Blanket and basin are both forms of _____
- (b) Xylem is a tube in plants which carries _____
- (c) A broiler is a type of _____
- (d) An example of a dual breed of cow is a _____
- (e) *Mucor* is a form of _____

(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.
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Question 8

Cereal production in Ireland can be limited due to weather conditions and soil suitability.

Answer the following in relation to a named cereal crop studied.

- (a) Name **two** varieties of your chosen cereal crop.
- (b) Describe the weather conditions that would hamper crop growth and quality.
- (c) State **two** soil characteristics necessary for successful crop growth.
- (d) Describe how you would prepare the soil for the sowing of the crop.
- (e) Give details of a named disease in your chosen cereal crop under the following headings
 - Name of disease
 - Cause of disease
 - Symptoms of disease
 - Treatment of disease
- (f) When and how is the crop harvested?
- (g) The storage of the cereal crop is important. State **three** conditions necessary for the proper storage of your chosen cereal crop.

(60 marks)

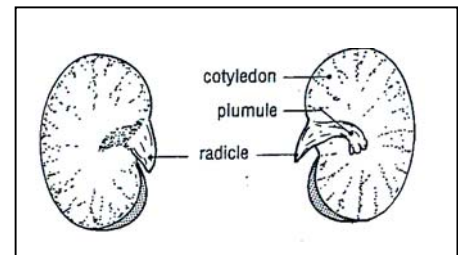
Question 9

- (a) (i) With the aid of labelled diagrams explain the leader-follower system of management.
(ii) State **two** reasons for the cause of bloat in cows in early spring on grass.
(iii) Describe how the EUROP system of classification works.
(iv) Show using a labelled diagram, the difference in shape and conformation between beef and dairy breeds of cattle.
- (b) In addition to feeding silage, hay and concentrates (meals), some farmers use root crops such as fodder beet and swedes to feed farm animals.
- (i) State **one** advantage and **one** disadvantage to the farmer for using these root crops.
(ii) Name the main constituents of a concentrate ration (meal).
(iii) What is the importance of a balanced ration to the farm animal?

(60 marks)

Question 10

- (a) The diagram is that of a broad bean seed.
- (i) Is this an example of a monocotyledon or dicotyledon seed?
(ii) State **one** function of each of the named parts in the diagram.
- (b) This seed will undergo a process called germination.
- (i) Explain the underlined term.
(ii) Describe with the aid of a labelled diagram an investigation you carried out to show the influence of **one named** factor on germination.



- (c) Pollination and pollution, are two processes that occur in the environment.
- (i) Explain the term pollination.
(ii) State **two** methods by which pollination occurs.
(iii) State **three** causes of possible pollution on a farm and explain how each cause can be prevented.

(60 marks)

Question 11

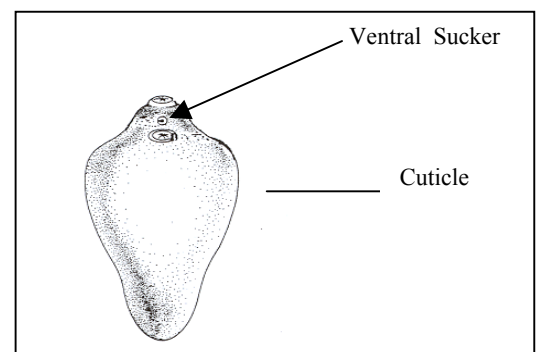
Answer any **two** parts, (a), (b), (c) or (d).

- (a) Milk is considered to be a basic food requirement.
 - (i) State the composition of fresh milk.
 - (ii) Describe a laboratory investigation to show the presence of **one named** component of fresh milk.
 - (iii) How can the farmer prevent contamination of milk in the milking parlour?
- (b) Pig production is a specialised type of farming.
 - (i) List **three** necessary housing conditions in a pig production unit on a farm.
 - (ii) Describe the management and feeding of the sow during pregnancy.
 - (iii) What is the function of the farrowing crate?
- (c) Mineral elements are important for healthy plant growth.
 - (i) List **three** mineral elements that influence the level of fertility in the soil.
 - (ii) Describe with the aid of labelled diagrams a laboratory investigation to show the effects of a mineral deficiency on the growth of a plant.
- (d) Silage is fermented grass.
 - (i) Name **one** bacterium involved in ensiling the grass.
 - (ii) State **three** ways the farmer can encourage high levels of sugar in the grass.
 - (iii) Outline the procedures involved for the correct harvest and storage of silage.

(60 marks)

Question 12

- (a) The liver is a large storage organ found in farm animals.
 - (i) In what region of the body is this organ located?
 - (ii) State **two** materials that are stored in the liver.
 - (iii) Name **two** other storage organs in the body.
- (b) The diagram is of a liverfluke (*Faciola hepatica*) an organism that occurs in the liver of some farm animals.
 - (i) Describe the functions of the labelled parts in the diagram.
 - (ii) Name **two** farm animals in which liverfluke can be found.
 - (iii) State **two** symptoms an animal would have if infected with liverfluke.
 - (iv) How can the farm animal be treated immediately for the liverfluke infection?
 - (v) Explain **three** methods of control the farmer can use to prevent further liverfluke infection on the farm.
- (c) When purchasing a new animal the farmer will look at its condition.
 - (i) What signs in the animal's appearance and activity are indicators of good health?
 - (ii) Explain what is meant by the condition-scoring of an animal.



(60 marks)

Question 13

- (a) **Meiosis** and **Mitosis** are two forms of cell division. Copy and complete the table below in your answer booklet using the following list to compare the two forms of cell division.

	Identical cells formed Non-identical cells formed	New cells are haploid New cells are diploid
Type of cell division (mother cell is diploid)	Identical or non identical cells formed	New cells are haploid or new cells are diploid
Meiosis		
Mitosis		

- (b) In farming the use of A.I. has increased in the last number of years.

- (i) What do the letters A.I. stand for?
- (ii) State **one** advantage and **one** disadvantage of A.I. in cattle.
- (iii) Distinguish between performance testing and progeny testing of bulls.

- (c) A shorthorn bull homozygous for red colour (**RR**) is crossed with a shorthorn cow homozygous for white colour (**rr**). The offspring (**F1**) are heterozygous for roan colour.

- (i) State the genotype of the **F1** offspring.
- (ii) Explain why the offspring are a roan colour.
- (iii) If another shorthorn bull homozygous for red colour (**RR**) is crossed with the offspring (**F1**), what will be the genotypes and phenotypes of the second generation (**F2**)? Copy the following into your answer book and complete the spaces (genotypes in brackets, phenotypes on lines).

The genotypes of the second generation parents
(Homozygous red bull and heterozygous roan cow) () x ()

The gametes produced by each parent () x () ()

The genotypes of the second generation (**F2**) () x ()

The phenotypes of the second generation (**F2**) _____

(60 marks)