

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, 2010

AGRICULTURAL SCIENCE - ORDINARY LEVEL

THURSDAY, 24 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.

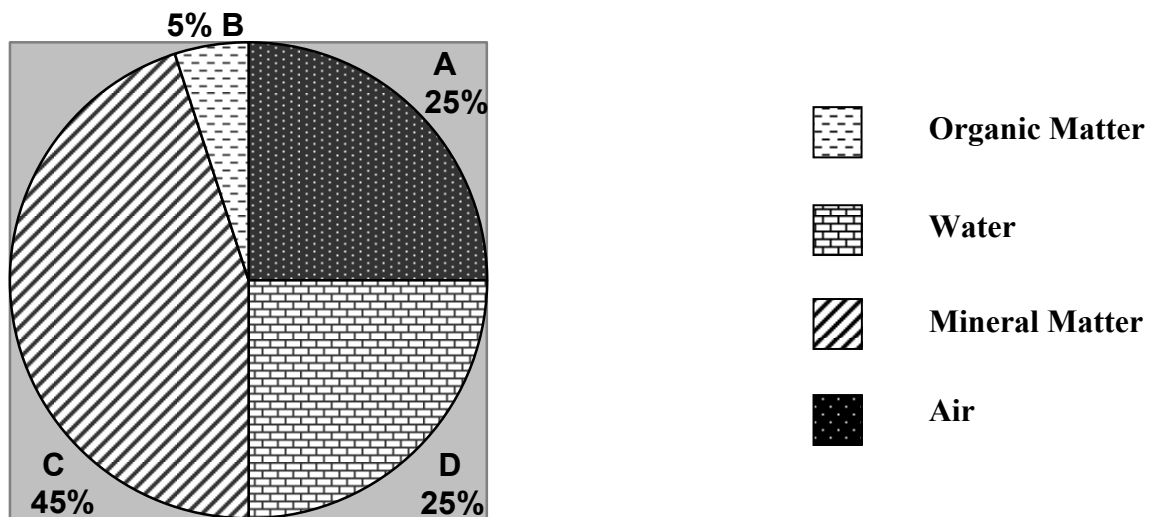
*You should not spend more than 45 minutes on Section One,
 leaving 105 minutes for Section Two.*

Instructions

- Answer any **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.

(a) The following chart shows the composition of a soil. Identify A, B, C and D from the information below.



- A. _____
- B. _____
- C. _____
- D. _____

(b) Soil includes different types of mineral particles. List any **two** of these particle types.

- (i) _____
- (ii) _____

(c) Give **one** example of an organism that is of benefit to soil.

_____ (20 marks)

Question 2.

Many agricultural activities require the use of farm machinery. Choose a machine from the list below and match it to an activity listed in the table. The first one has been completed as an example.

- A. Elevator digger
- B. Combine drill
- C. Rotary tedder

- D. Subsoiler
- ~~E. Round baler~~
- F. Combine harvester

Agricultural activity	Machine used
1. Making bales of silage	E. Round baler
2. Harvesting barley	
3. Making hay	
4. Harvesting potatoes	
5. Sowing seed	
6. Breaking up compacted soil	

(20 marks)

Question 3.

(a) Choose **two** dairy breeds from the following list of cattle breeds:

- Charolais Friesian Simmental Jersey Hereford**

Dairy breed 1. _____

Dairy breed 2. _____

(b) Describe **two** physical characteristics of a good dairy cow.

(i) _____

(ii) _____

(c) What do the terms *lactation* and *colostrum* mean with regard to dairy cows?

Lactation. _____

Colostrum. _____

(d) What is the length of the standard lactation in dairy cows?

_____ (20 marks)

Question 4.

Notifiable diseases must, by law, be reported to the authorities. Place a tick (√) in the correct box in each case to indicate if a disease is notifiable or not. The first one has been completed as an example.

Name of disease	Notifiable	Not Notifiable
Foot and Mouth Disease	√	
Mastitis		
Swine fever		
Brucellosis		
Liverfluke		
Tuberculosis (TB)		

(20 marks)

Question 5.

(a) Identify the plants in the following photographs:

Plant A



Plant B



Plant A. _____

Plant B. _____

Plant C



Plant D



Plant C. _____

Plant D. _____

(b) Name the family to which Plant B belongs. _____

(c) Which of the above plants is usually considered to be a weed? _____

(d) Name a **by-product** of the processing of Plant D. _____

(20 marks)

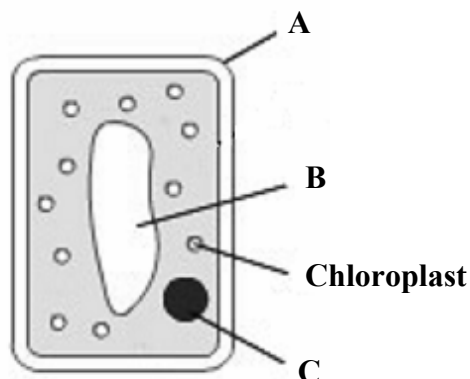
Question 6.

(a) The following is a diagram of a plant cell. Name the parts labelled A, B and C.

A. _____

B. _____

C. _____



(b) What is the name of the green pigment found in chloroplasts?

(c) What is the function of the green pigment?

(20 marks)

Question 7.

Indicate whether each of the following statements is TRUE or FALSE by circling the correct answer. The first one has been completed as an example.

	TRUE	FALSE
Boron prevents heart rot in sugar beet.	<input checked="" type="radio"/> T	<input type="radio"/> F
(a) <i>Rooster</i> is a variety of barley.	<input type="radio"/> T	<input type="radio"/> F
(b) Crop rotation encourages pests.	<input type="radio"/> T	<input type="radio"/> F
(c) Chickens have a gizzard in their digestive system.	<input type="radio"/> T	<input type="radio"/> F
(d) Thinning forest trees encourages growth.	<input type="radio"/> T	<input type="radio"/> F
(e) Iodine is used to test for protein in food.	<input type="radio"/> T	<input type="radio"/> F
(f) Animal cells have no nucleus.	<input type="radio"/> T	<input type="radio"/> F
(g) Pigs are ruminant animals.	<input type="radio"/> T	<input type="radio"/> F
(h) FCR means Feed Conversion Ratio.	<input type="radio"/> T	<input type="radio"/> F
(i) Cobalt deficiency causes pine in sheep.	<input type="radio"/> T	<input type="radio"/> F
(j) Blight is a fungal disease.	<input type="radio"/> T	<input type="radio"/> F

(20 marks)

Section Two (180 marks)

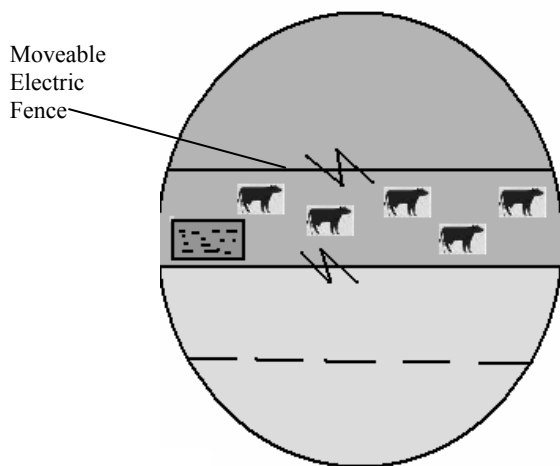
Instructions

Write your answers to Section Two in your answer book.

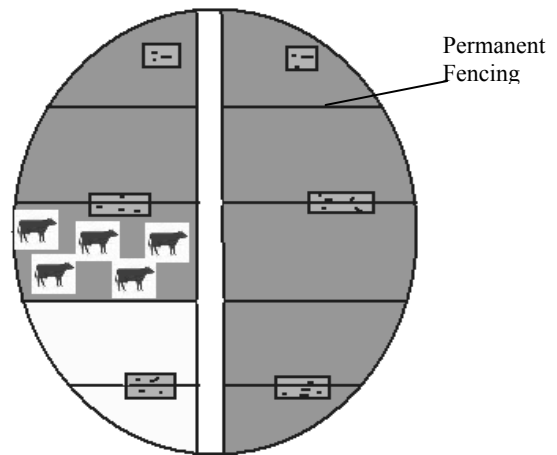
Answer any **three** questions. Each question carries 60 marks.

Question 8.

(a) The following diagrams show two grazing systems used in Ireland.



Grazing System A



Grazing System B

- (i) Identify **each** grazing system.
 - (ii) Explain how **each** of the grazing systems works.
 - (iii) State **one** advantage and **one** disadvantage of **each** of the grazing systems named.
 - (iv) Name **one** other system of grazing you have studied.
- (b)
- (i) Name **one** grass and **one** other plant species suitable for good quality grazing for livestock.
 - (ii) Give a reason for the use of **each** of the named species.
- (c) Describe **one** method of sowing a field for pasture.
- (d) Grazing pasture can be improved by tillering and topping. Explain **each** of the underlined terms.

(60 marks)

Question 9.

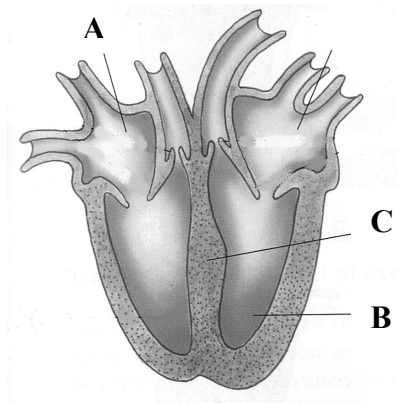
A farmer has decided to produce a particular crop for the first time. The results of a soil test indicate that the soil has a low pH **and** is lacking in minerals.

- (a) Suggest **one** way in which the farmer can raise the pH of the soil.
- (b) List **two** minerals normally present in the soil.
- (c) Give the name of a root crop **or** a cereal crop that could be sown.
- (d) Name a fertilizer suitable for the crop you named in part (c).
- (e) Describe the cultivation of the crop you have named in part (c) under the following headings:
 - (i) Preparation of seedbed.
 - (ii) Seed sowing date.
 - (iii) Diseases or pests of the crop.
 - (iv) A suitable method of disease or pest control (to match part (iii)).
 - (v) Harvest date.
 - (vi) Yield.
- (f) Describe an experiment to determine the earthworm population of the field.

(60 marks)

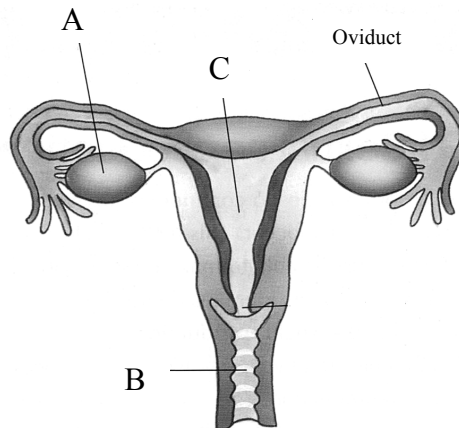
Question 10.

(a) The diagram below is of a sheep's heart.



- (i) Name, **in your answer book**, the parts labelled A, B, and C.
- (ii) List **three** types of blood cell.
- (iii) Give the function of **each** type of blood cell.
- (iv) New-born bonhams often suffer from a blood-related illness called anaemia.
What is the cause of anaemia?
- (v) Describe how anaemia in bonhams can be prevented.

(b) The diagram below shows the reproductive system of a cow.



- (i) Name, **in your answer book**, the parts labelled A, B, and C.
- (ii) Sheep farmers often use a technique called 'flushing' to improve conception rates.
What is meant by *flushing*?
- (iii) List **three** advantages of flushing.
- (iv) Cattle farmers often use A.I. to improve conception rates.
What does A.I. stand for?
- (v) Give **one** advantage of A.I.

(60 marks)

Question 11.

- (a) Irish beef animals are graded at slaughter according to their fatness and conformation.
- (i) Explain the term *conformation*.
 - (ii) Describe the difference in conformation between beef cattle and dairy cattle.
 - (iii) What is the usual age for the slaughter of beef cattle in Ireland?
 - (iv) Why are beef cattle slaughtered at this age?
- (b) Sheep breeding is an important part of the livestock industry in Ireland.
- (i) Name **two** breeds of sheep used for lamb production in Ireland.
 - (ii) What is the average weight of a lamb at birth?
 - (iii) Describe the feeding **and** management of a new-born lamb.
- (c) Livestock farmers often use a system called ‘creep feeding’.
- (i) What does the term *creep feeding* mean?
 - (ii) Give **three** advantages of creep feeding. **(60 marks)**

Question 12.

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

- (a) A group of students carried out a survey of plants in an old pasture.
- (i) List **two** weeds they might find in the pasture.
 - (ii) Name **one** piece of equipment that could be used in carrying out the survey.
 - (iii) Describe how the named piece of equipment may be used in estimating the number of a particular plant in the field.
- (b) In the pig production industry a sow is moved to a farrowing house to have her litter of bonhams.
- (i) What is the most suitable temperature for the farrowing house?
 - (ii) Why is the sow kept in a farrowing crate?
 - (iii) After the bonhams are weaned the sow and bonhams are moved to different houses. Give the names of the houses for
 1. The sow
 2. The bonhams.
 - (iv) What criteria are used when selecting a gilt for breeding?
- (c) Farmers can do many things to improve the environment on their farm.
- (i) Give **three** advantages of planting **or** preserving hedgerows.
 - (ii) List **two** ways of reducing the amount of fertilizer that runs off into waterways.
 - (iii) What is meant by organic farming?
- (d) Germination and establishment are two stages in plant development.
- (i) Explain **each** of the underlined terms.
 - (ii) Outline an experiment to show the conditions necessary for germination.

Question 13.

- (a) Read the following paragraph about the study of genetics and match the words **from the list below** with the numbered spaces.

Write your answers in your answer book and not on this examination paper.

phenotype heterozygous recessive homozygous dominant genotype

Much of the early work in genetics was carried out by Gregor Mendel (1822 – 1884) on the edible pea. In one experiment he crossed tall-stemmed plants (**TT**) with dwarf-stemmed plants (**tt**) and found that all the plants in the next generation were tall-stemmed. In modern genetics tall is said to be **1** over dwarf. The trait which disappeared in the first filial generation (F_1) is said to be **2** . These plants (**Tt**) in the F_1 generation are said to be **3** because the two members of this pair of alleles are different. When two members of a pair of alleles are identical the pea plant is said to be **4** for that trait. The genetic make-up of the pea plants is known as the **5** and the physical appearance is known as the **6** .

- (b) The pig in the photograph shows the dominant characteristic of erect ears.



- (i) A pure-breeding pig with erect ears (**EE**) was crossed with a pig with drooping ears (**ee**).

Copy the following into your answer book and complete the cross by filling in the spaces to show the possible gametes, genotype and phenotype.

The genotypes of the parents	(EE)	x	(ee)
The gametes produced by each parent	()	x	()
The genotype of the offspring	()		
The phenotype of the offspring	_____		

- (ii) One of the offspring of the above cross is then crossed with another pure-breeding pig with erect ears.

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

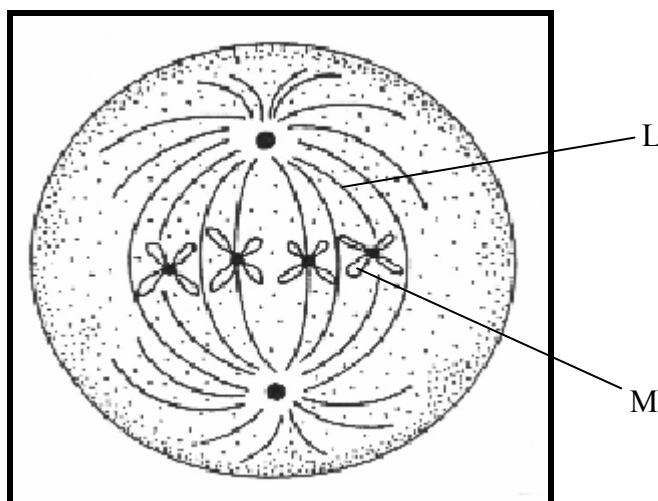
The genotypes of the parents (EE) x ()

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

The genotypes of the offspring () ()

The phenotype of the offspring _____

- (c) (i) Mitosis is one of the two types of cell division.
Name the other type of cell division.
- (ii) The diagram shows the metaphase stage of mitosis.
Name the parts of the diagram labelled L and M.



(60 marks)

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