

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, 2015

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.

Write your answers in the spaces provided in this examination paper.

Section Two: Three questions must be answered.

Each question carries 60 marks.

Write your answers in the answerbook.

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

Write your examination number in the space provided on page 1.

Answer **six** questions. Each question carries **20** marks.

Write your answers in the spaces provided.

Keep your answers short.

Question 1.

A list of plant parts is given below.

Place these in **Column A** to match the description of each part in **Column B**.

The first one is completed as an example.

List: Stamens; Phloem; Petals; Xylem; Carpels; Stomata.

A	B
Petals	Attract bees and insects
	Male parts of flower
	Transports water through plant
	Openings on underside of leaf
	Female parts of flower
	Transports food through plant

(20 marks)

Question 2.

Some organisms of importance in agriculture are listed in the table below.

In the table, name the phylum to which each organism belongs **and** state **one** reason why the organism is important in agriculture.

Organism	Phylum	Importance in Agriculture
Roundworm		
Liver Fluke		
Butterfly		
Mud Snail		

(20 marks)

Question 3.

Indicate whether the following statements are true (**T**) or false (**F**) by placing a circle around the correct answer in each case as shown in the example.

Example: **Suffolk is a breed of cow.** T (**F**)

- (a) Germination is the production of food in the leaf. T F
- (b) Pneumonia is a common disease of **calves**. T F
- (c) Biuret reagent is used to test for protein. T F
- (d) Urea is a high nitrogen fertiliser. T F
- (e) Oak is a coniferous tree. T F
- (f) Powdery mildew is a disease of **barley**. T F
- (g) Incisors are teeth used for cutting food. T F
- (h) A hogget is a type of pig. T F
- (i) Kale is an example of a catch crop. T F
- (j) Cows reach their peak milk yield one week after calving. T F

(20 marks)

Question 4.

Four spring cereal crops commonly grown in Ireland are shown below.



A



B



C



D

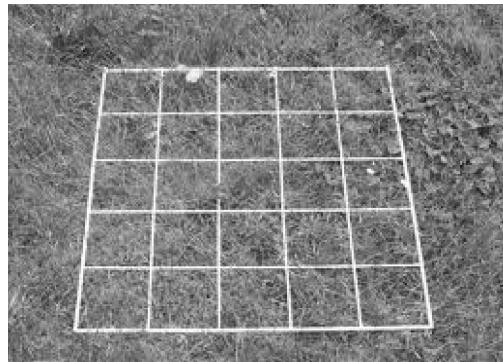
In the table, identify **one** of the crops shown above and complete the table in relation to the crop you have chosen.

Crop A, B, C or D <input type="text"/>	Name of crop <input type="text"/>
Time of sowing	
Use of crop	
Seeding rate (kg/ha)	
Yield of crop (t/ha)	

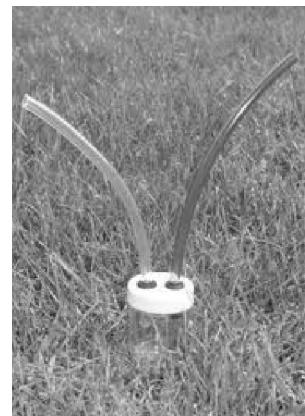
(20 marks)

Question 5.

Four pieces of apparatus commonly used in habitat study are shown below.
In the table, give the **name and use** for each piece.



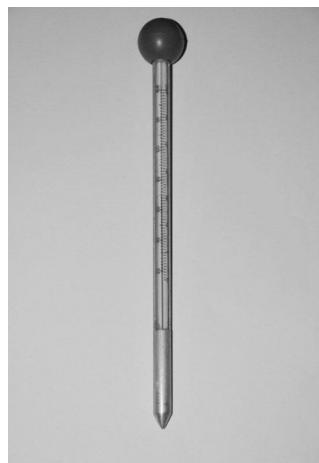
A



B



C



D

Apparatus	Name	Use
A		
B		
C		
D		

(20 marks)

Question 6.

Four common diseases of cattle that are caused by microorganisms are listed in the table below. In the table, state which type of microorganism is responsible for causing each disease **and** one method of prevention or treatment of each disease.

One example is given in the table.

Disease	Microorganism Type	Prevention/Treatment
TB	Bacteria	Breeding own replacements
Mastitis		
Pneumonia		
Ringworm		
Blackleg		

(20 marks)

Question 7.

Give **one** scientific reason why **each** of the following practices is carried out on Irish farms.

- (a) Sheep are culled from the flock.

- (b) Cows are ‘dried off’ two months before calving.

- (c) Trees in a forest plantation are thinned after about twenty years.

- (d) Lime is spread on some soils.

- (e) Great care is taken when agitating slurry.

(20 marks)

SECTION TWO (180 MARKS)

Instructions

Write your answers to Section Two into your answer book.

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

Question 8.

The two most common methods of grass conservation used in Ireland are silage production and hay production.

- (a) (i) Name **two** grass species commonly used in silage or hay production.
(ii) At what stage should the grass be cut for good quality silage?
(iii) A long spell of dry weather is essential for making hay.
What is the scientific reason for this?
(iv) Give the **name** of a bacterial species needed to make good quality silage.

- (b) (i) Describe the steps you would carry out to make good quality hay.
(ii) Give **three** advantages of silage production over hay production.
(iii) Give **three** advantages of round bale silage over pit silage.

- (c) Describe a laboratory or field experiment to estimate percentage (%) dry matter in a silage sample.

(60 marks)

Question 9.

Beef breeds and dairy breeds are commonly found on Irish cattle farms.

- (a) (i) Name **two** beef breeds and **two** dairy breeds.
(ii) Describe **three** differences between the conformation of beef and dairy breeds.

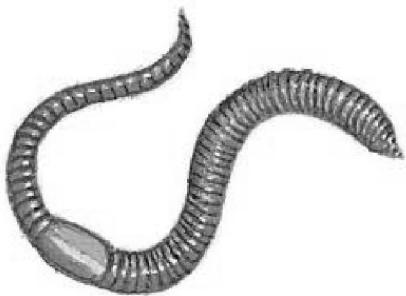
- (b) (i) Condition scoring is an important skill in cattle farming.
Explain what is meant by *condition scoring* in cattle.
(ii) What condition score is recommended for cows at mating?
(iii) Explain why a high condition score in cows can cause problems at calving.

- (c) (i) State **two** precautions that should be taken when buying in replacement heifers.
(ii) Describe **two** common practices aimed at keeping livestock diseases from entering a farm.

(60 marks)

Question 10.

- (a) The main mineral component of soil is made up of different particles of weathered rock.
- (i) State **three** methods of physical weathering.
 - (ii) Name any **three** soil particle types.
- (b) (i) Explain the term *soil texture*.
- (ii) Describe an experiment to determine the texture of a soil sample.
- (c) Organisms such as the one shown below are of great benefit to the soil.

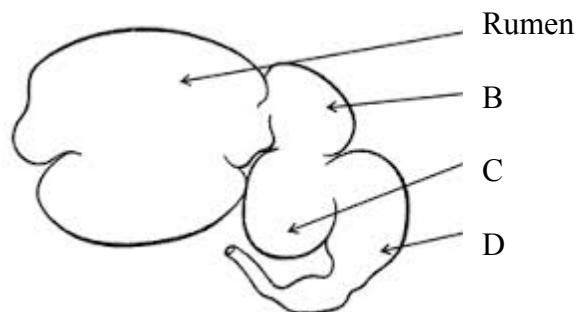


- (i) Name the organism shown above.
- (ii) Mention **two** ways in which the above organism benefits the soil.
- (iii) Describe an experiment to estimate the number of these organisms in the soil.

(60 marks)

Question 11.

The ruminant stomach is shown in the diagram below.



- (a) (i) The cow has a ruminant stomach.
Name: 1. **one** other livestock species that has this type of stomach **and**
2. **one** livestock species that **does not** have this type of stomach.
(ii) Name the chambers of the stomach labelled B, C and D.
(iii) Which chamber of the ruminant stomach most closely resembles the monogastric stomach?
- (b) (i) Name the **main** constituent of grass that is digested in the ruminant stomach.
(ii) Food is regurgitated from chamber B.
How does this benefit the animal?
(iii) What happens to the food in chamber C?
(iv) Precisely which part of the digestive system does food enter when it leaves part D?
- (c) (i) Describe how the diet of the calf is changed over the first twelve weeks of life.
(ii) Bloat is a common disorder in cattle. What causes bloat?

(60 marks)

Question 12.

- (a) (i) Draw a simple diagram of a plant cell as seen under a light microscope.
Label any **three** parts, other than chromosomes.
(ii) Where in the cell are the chromosomes found?
(iii) Name the process by which an animal or plant cell divides into two identical cells.
- (b) In wheat, the allele for red kernel (R) is dominant over the allele for white kernel (r).
A wheat plant, homozygous for red kernel (RR), is crossed with a plant homozygous for white kernel (rr).

Copy the following into your answer book and complete the spaces.

Genotypes of original parents (RR) × (rr)

(i) Possible gametes ×

(ii) F1 genotype ()

(iii) F1 phenotype _____

- (c) **In your answer book**, show a cross between a homozygous recessive plant and an F1 plant from the above cross.

Show the following in your cross:

	Homozygous recessive	F1 from above
(i) Genotypes of parents	()	× ()
(ii) Possible gametes	<input type="circle"/>	× <input type="circle"/> <input type="circle"/>
(iii) Genotypes of offspring	()	()
(iv) Phenotypes of offspring	_____	_____

(60 marks)

[OVER]

Question 13. Answer any **two** of the parts (a), (b), (c), (d).

(30 marks, 30 marks)

- (a) (i) State the length in **days** of the gestation period in ewes.
(ii) Give any **three** reasons for housing sheep at lambing time.
(iii) List **three** features of winter housing for sheep.
(iv) Describe the use of the following at lambing time:
1. The infra-red lamp
2. The fostering crate.
- (b) (i) Name **one** variety of **each** of the following categories of potato:
1. First early potatoes
2. Second early potatoes
3. Maincrop potatoes.
(ii) Explain why seed potatoes are mainly grown in Co. Donegal.
(iii) Give **two** reasons for earthing-up of potatoes.
(iv) State **two** conditions needed for the storage of harvested potatoes.
- (c) The table below shows an average composition of cow's milk.
- | Constituent | Percentage (%) |
|-----------------------|----------------|
| A | 87.5 |
| Lactose | 4.6 |
| Fats | 3.8 |
| B | 3.3 |
| Minerals and vitamins | 0.8 |
- (i) Identify A and B from the table.
(ii) A number of factors affect fat content in milk. List any **three** of these factors.
(iii) To ensure milk is of good quality, it is tested in a number of ways.
List any **three** of these tests, **other than** tests for fat or protein content.
(iv) Explain any **two** management practices to ensure good hygiene at milking.
- (d) In pig production, the sow is moved to the farrowing house to have her bonhams (piglets).
(i) What is the temperature in the farrowing house?
(ii) Name **two** other parts of a pig production unit.
(iii) Explain the use of the farrowing crate.
(iv) Describe **two** practices carried out on newly born bonhams.
(v) At what age are bonhams normally weaned?
(vi) Food conversion ratio (FCR) is a very important consideration in pig production.
Explain the term *FCR*.

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