

**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**

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**LEAVING CERTIFICATE EXAMINATION, 2013**

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**AGRICULTURAL SCIENCE – ORDINARY LEVEL**

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**THURSDAY, 20 JUNE – MORNING, 9.30 – 12.00**

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*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 your 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)

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### 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.

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### Question 1.

A list of common animal diseases is given below.

Place these in **Column A** to match the cause of each disease in **Column B**.

The first one is completed as an example.

**List:** Red Water Fever; Mastitis; ~~Milk Fever~~; Sheep Scab; Joint-ill Disease; Twin-lamb Disease.

A	B
Milk Fever	Deficiency of calcium
	Caused by mange mite
	Bacterial disease of udder
	Caused by protozoan <i>Babesia</i>
	Ewes lacking nutrition
	Bacteria enter the navel

(20 marks)

**Question 2.**

All the machinery shown in the photographs below is used on farms.

- (a) Match the letters over the photographs with the names of the machines in the table.
- (b) Give the main use of each piece of machinery in the table.

**A**



**B**



**C**



**D**



**E**



Machine	(a) Letter	(b) Main use on farms
Roller		
Disc harrow		
Combine harvester		
Subsoiler		
Hay tedder		

(20 marks)

**Question 3.**

(a) Name **one** variety of maincrop potatoes.

\_\_\_\_\_

(b) In Ireland, seed potatoes are mainly grown in Co. Donegal. Give a reason for this.

\_\_\_\_\_

\_\_\_\_\_

(c) State **two** methods of prevention or control of potato blight.

(i) \_\_\_\_\_

(ii) \_\_\_\_\_

(d) Name **one** common insect pest of potatoes.

\_\_\_\_\_

**(20 marks)**

**Question 4.**

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

**Example: Limestone is a sedimentary rock.**

T    F

(a) Powdery mildew is a disease of cereals.

T    F

(b) Scottish Blackface is a mountain sheep breed.

T    F

(c) Tillering means cultivating the soil.

T    F

(d) Thistle belongs to the family Compositae (Asteraceae).

T    F

(e) Urea is a fertilizer high in potassium.

T    F

(f) Hay has a high moisture content.

T    F

(g) Cattle have a monogastric stomach.

T    F

(h) Most food chains begin with a green plant.

T    F

(i) Holstein is a common beef breed.

T    F

(j) Positive phototropism is the growth response of a plant towards light.

T    F

**(20 marks)**

**Question 5.**

The following pieces of equipment are used regularly in agriculture.  
Give a use for **each** piece of equipment in the space provided.

(a) Burdizzo:

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(b) Fostering crate:

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(c) Infra-red lamp:

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(d) Bulk tank:

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(e) Calving jack:

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**(20 marks)**

**Question 6.**

- (a) (i) The Friesian cow is described as a dual-purpose breed.

Explain the term *dual-purpose* in this context.

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- (ii) What is the expected milk yield in litres per lactation for a high yielding Holstein-Friesian cow?

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- (iii) At what age might a cow be expected to reach her maximum milk yield?

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- (b) Cows may have to be removed or culled from the herd for a number of reasons. Outline any **two** reasons for culling cows.

Reason 1. \_\_\_\_\_

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Reason 2. \_\_\_\_\_

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**(20 marks)**

**Question 7.**

Give a scientific reason why **each** of the following tasks is carried out on farms:

(a) Silage pits are rolled.

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(b) Sheep are walked through a foot-bath.

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(c) Milking cows are fed dairy rations.

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(d) Hay is introduced to the diet of a calf about one week after birth.

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(e) Slurry is agitated from outside slatted houses.

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**(20 marks)**

**[OVER**

## SECTION TWO (180 MARKS)

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### Instructions

Write your answers to Section Two into your answer book.

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

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#### Question 8.

- (a)
  - (i) Barley is a cereal crop. Name **two** other cereal crops grown in Ireland.
  - (ii) Give **two** uses of barley.
  
- (b) Describe the cultivation of barley under the following headings:
  - (i) Soil suitability.
  - (ii) Sowing.
  - (iii) Weed control.
  - (iv) Harvesting.
  
- (c) Certified seed should be sown when cultivating barley.  
List **three** features of certified seed.
  
- (d) Describe a laboratory or field experiment to estimate the percentage (%) germination of a barley seed sample.

(60 marks)

#### Question 9.

- (a)
  - (i) Name **two** breeds of pig used in commercial pig production in Ireland.
  - (ii) Describe **one** feature of **each** named breed.
  
- (b) List **two** managerial practices carried out on bonhams (piglets) during the first week after birth.
  
- (c) Describe the management of pigs in the following pig production houses:
  - (i) Dry sow house.
  - (ii) Fattener house.
  
- (d) Explain the following terms in relation to pig production:
  - (i) Food conversion ratio (FCR).
  - (ii) Gilt.
  - (iii) Farrowing crate.
  - (iv) Delousing.

(60 marks)



**Question 10.**

- (a) British breeds and continental breeds are commonly used in beef production in Ireland.
- (i) Give **one** example of **each** type of breed.
  - (ii) Explain **one advantage** and **one disadvantage** of **each** type of breed.
- (b) Two-year calf-to-beef is a common beef production system.  
Give the target weights for beef cattle in this system at the following stages:
- (i) Start of first winter housing.
  - (ii) Start of second winter housing.
  - (iii) Slaughter.
- (c) Describe the housing of weanlings during their first winter.
- (d) *Store period* and *compensatory growth* are important terms in beef production.  
Explain **each** term.

**(60 marks)**

**Question 11.**

- (a) Earthworms belong to the phylum Annelida and play a very important role in the soil.
- (i) Give **two** characteristic features of the phylum Annelida.
  - (ii) Describe any **three** benefits earthworms bring to the soil.
  - (iii) Describe an investigation to estimate the earthworm population in a pasture.

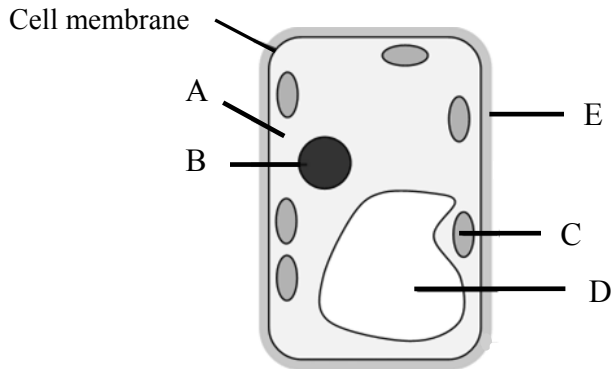


- (b) (i) Describe any **three** factors involved in soil formation.  
(ii) Describe **two** features of a podzol soil.
- (c) Regular liming of soil is a very important practice. Explain the importance of liming in relation to the following:
- (i) Soil pH.
  - (ii) Flocculation.
- (d) Describe **two** benefits of adding farm yard manure (FYM) to the soil.

**(60 marks)**

**Question 12.**

- (a) Progeny testing of bulls is a common practice in dairying and beef production systems in Ireland.
- Explain the term *progeny testing*.
  - Comment on the usefulness of progeny test information to the modern animal-production farmer.
- (b) The diagram shows the main parts of a plant cell. The cell membrane is already labelled.



- In your answer book** identify parts A, B, C, D and E.
  - In which part are the chromosomes found?
  - What is the function of chromosomes?
- (c) In maize the allele for green plants (G) is dominant over the allele for albino plants (g). A maize plant homozygous for green colour (GG) was crossed with a maize plant homozygous for albino colour (gg). The F1 individuals were heterozygous. **Copy the following into your answer book** and complete the spaces (genotypes in brackets, phenotypes on lines).

Genotypes of original parents (GG) × (gg)

(i) Possible gametes ( ) × ( )

(ii) F1 genotype ( )

(iii) F1 phenotype \_\_\_\_\_

- (d) **In your answer book** show a cross between an albino plant and an F1 plant from the above cross.

In your cross show:

(i) Genotypes of parents ( ) × ( )

(ii) Possible gametes ( ) × ( ) ( )

(iii) Genotypes of offspring ( ) ( )

(iv) Phenotypes of offspring \_\_\_\_\_

**(60 marks)**

**Question 13.**

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

**(30, 30)**

- (a) (i) Name **two** species of coniferous trees grown in Irish forests.  
(ii) Describe the main features of tree planting in a commercial forest.  
(iii) Explain why weeds must be controlled around trees **and** how this is carried out.  
(iv) Give the reasons why trees are thinned in commercial forests.
- (b) (i) Identify, **in your answer book**, the **four** species of grass shown in the photographs below, from the following list:

**List: Cocksfoot; Italian ryegrass; Meadow foxtail; Perennial ryegrass.**



**A**



**B**



**C**



**D**

- (ii) List any **two** species that are commonly used in grass seed mixtures for grazing pastures.  
(iii) Choose **one** of the species referred to in part (ii) **and** give **two** features that make it suitable for grazing.
- (c) (i) Flushing and sponging of ewes are common practices in sheep production. Explain the terms *flushing* and *sponging* as used here.  
(ii) Maggots are a common parasite of sheep. Maggots are the larvae of which insect?  
(iii) Describe **three** common methods of maggot prevention or control in sheep management.
- (d) (i) Draw a diagram of the breathing system of a mammal. Label any **three** parts.  
(ii) Viral pneumonia is a common illness during calf housing. How can viral pneumonia be prevented?  
(iii) Describe briefly the life cycle of lungworms.  
(iv) Outline **one** method of control of lungworms in cattle.

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