

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 2019

AGRICULTURAL SCIENCE – ORDINARY LEVEL

MONDAY 17 JUNE – AFTERNOON 2:00 – 4:30

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

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) (i) Name the phylum to which earthworms belong.

- (ii) State **two** beneficial effects of earthworms in the soil.

1. _____

2. _____



- (b) The photograph shows a wormery, which is used to show the activity of earthworms.

- (i) Describe four steps taken when setting up the wormery to investigate earthworm activity.

1. _____

2. _____

3. _____

4. _____



- (ii) Name one sign of earthworm activity that would be observed in the wormery at the end of the investigation.

Question 2.

Name **and** state the function of **each** of the items of farm equipment and machinery shown below.
Item A has been completed for you in the table.



A



B



C



D



E



F

Item/ Machine	Name	Function
A	Silage Wagon	Transports grass from field to cattle or to pit
B		
C		
D		
E		
F		

Question 3.

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

- Example: Liver fluke is a parasite of sheep and cattle.** **T** **F**
- (a) A gilt is a young female pig. **T** **F**
- (b) Benedict's or Fehling's solution is used to test a food for starch. **T** **F**
- (c) Ground limestone is used to raise soil pH. **T** **F**
- (d) Plants make carbon dioxide (CO_2) during photosynthesis. **T** **F**
- (e) Urea is a fertiliser which has a high content of nitrogen. **T** **F**
- (f) Pigs have a rumen in their digestive system. **T** **F**
- (g) Crop rotation helps control crop pests. **T** **F**
- (h) Chlorophyll is a pigment found in grass. **T** **F**
- (i) Dairy cows are usually dried off for five months each year. **T** **F**
- (j) Pollen is produced by the carpels in a flower. **T** **F**

Question 4.

The following is a list of breeds of farm animals.

The list: Jersey, Suffolk, Holstein-Friesian, Landrace, Wicklow Cheviot, Belgian Blue.

In the table below there is a description of each of the named breeds.

Match **each** description with a breed name. The first one has been completed for you.

Name of breed	Description of breed
Wicklow Cheviot	Mountain/ hill sheep breed
	Cow with a high butterfat content in milk
	Beef breed of cattle
	Pig breed with lean carcass
	Sheep breed with good conformation
	Dairy breed with high milk yield

Question 5.

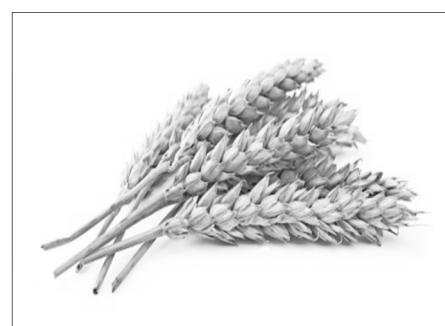
- (a) Identify **each** of the cereals shown in the photographs.



A



B



C

Cereal A. _____

Cereal B. _____

Cereal C. _____

- (b) State **two** ways you would know when cereal A is ready for harvesting.

(i) _____

(ii) _____

- (c) Certified seeds are used when sowing a cereal crop.

State **three** features of certified seeds.

(i) _____

(ii) _____

(iii) _____

Question 6.

State **one** reason for **each** of the following farming practices.

- (a) Spraying a potato crop with fungicide.

- (b) Housing of beef animals in the winter.

- (c) Paring the hooves of sheep.

- (d) Agitating slurry before it is spread.

- (e) Planting shelter belts on a farm.

Question 7.

The photograph shows nodules on the roots of a clover plant.



- (a) (i) Name the plant family to which clover belongs.

- (ii) What is contained in the root nodules in clover?

- (iii) What is the role of the contents of these nodules?

- (iv) Name another plant belonging to the same plant family as clover.

- (b) State **three** beneficial effects of including clover in a seed mixture when reseeding grassland.

(i) _____

(ii) _____

(iii) _____

Instructions

Write your answers to Section Two into your answer book.

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

Question 8.

- (a) (i) State **two** features of the housing used in pig production.
(ii) State the importance of any **one** of those housing features.
(iii) The photograph shows a sow and bonhams (piglets) in a farrowing crate. State **two** reasons for using farrowing crates.



- (b) (i) What is the length of gestation for a sow?
(ii) What is the average litter size for a sow?
(iii) Explain why each of the following is carried out in the rearing of pigs:
1. Bonhams (piglets) are given an iron injection
2. Lysine is included in the diet of pigs
3. A creep area is used.
- (c) Describe **either** hill (mountain) sheep production **or** lowland sheep production under the following headings:
(i) Grass quality
(ii) Method of grazing
(iii) Number of lambs produced
(iv) Stocking rate
(v) Amount of labour involved.

Question 9.

- (a) Many farmers reseed grassland on a regular basis.
- State **two** reasons why grassland may have to be reseeded.
 - Name **two** grass species commonly used when reseeding.
 - Explain the reason for using any **one** of the grass species named.
 - State **two** reasons why grassland is topped.
- (b) Feeding good quality silage is essential for cattle to reach production targets.
- List **four** stages in making good quality pit silage.
 - Explain the importance of any **two** of the steps mentioned.
 - Explain what is meant by the DMD of silage.
 - State the DMD of good quality silage.
- (c) The photograph shows stubble turnips which are grown as a catch crop.
- 
- What is meant by the term *catch crop*?
 - Name another example of a catch crop.
 - State **two** methods of feeding catch crops to farm animals.
 - Suggest **two** reasons why farmers are encouraged to grow catch crops.

Question 10.

(a) Explain the following terms used in genetics:

- (i) *Gamete*
- (ii) *In-breeding*
- (iii) *Clone.*

(b) Livestock without horns are referred to as polled animals.

In sheep the gene for having no horns (P) is dominant, and the gene for having horns (p) is recessive.

Copy and complete the following into your answerbook, to give the genotype and phenotype of the lambs from the cross.

Parents' phenotypes	Pure-breeding polled ram	Horned ewe
Parents' genotypes	PP	x
Gametes	()	x
Genotype of offspring	()	
Phenotype of offspring		

(c) A ram and a ewe with the same genotype as the offspring above are bred with each other.

Copy and complete the following into your answerbook, to give the possible genotypes and phenotypes of the lambs from this cross.

Parents' genotypes	()	x	()	
Possible gametes	()	()	x	()
Genotypes of offspring	()	()	()	
Phenotypes of offspring				

(d) Artificial insemination (AI) is carried out on some farm animals.

- (i) State **two** advantages of artificial insemination.
- (ii) State **two** disadvantages of artificial insemination.

Question 11.

(a) (i) From the list of rock types below, name, **in your answer book**,

1. a sedimentary rock
2. a metamorphic rock
3. an igneous rock.

The list: basalt, sandstone, marble, granite, limestone, slate.

(ii) What is meant by the weathering of rock?

(iii) Describe **two** ways in which rock is weathered.

(b) Describe a sandy soil **or** a clay soil under the following headings:

(i) How the soil feels

(ii) Particle size

(iii) Fertility

(iv) Suitability for tillage.

(c) (i) State **two** reasons why organic matter is important in a soil.

(ii) State **two** ways in which organic matter may be added to soil.

(iii) Explain why plants grown in clay soil survive better in a drought than those grown in sandy soil.

Question 12.

(a) Describe the care and management of a new-born dairy calf from birth to weaning, under the following headings:

- (i) Care at birth
- (ii) Changes in diet
- (iii) Housing
- (iv) Disease control.

(b) The photograph shows cows in a milking parlour.



Maintaining hygiene in a milking parlour is important; nevertheless, cows do sometimes contract mastitis.

(i) 1. What causes mastitis?

2. Describe **two** symptoms of mastitis.

(ii) Give another reason why maintaining a high level of hygiene in a milking parlour is important.

(iii) State any **three** ways that hygiene is maintained before, during, or after milking.

(c) Describe an experiment to compare the hygiene quality of two milk samples.

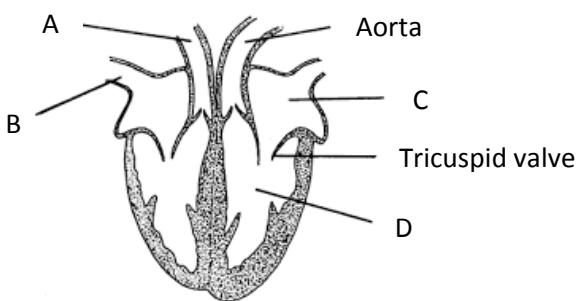
Question 13.

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

(30 marks, 30 marks)

- (a) (i) Name **two** varieties of maincrop potatoes.
- (ii) Describe the growing of maincrop potatoes under the following headings:
1. Soil preparation
 2. Time of planting
 3. Weed control
 4. Method of harvesting
 5. Expected yield
 6. Method of storage.

- (b) The diagram shows a dissected sheep's heart.



- (i) Name the parts labelled A, B, C, D.
- (ii) The blood in C and D has come from the lungs.
State **one** way blood changes as it passes through the lungs.
- (iii) Name **two** types of blood cell **and** state the function of **each**.
- (iv) Name the liquid part of blood.
- (c) (i) Give **two** reasons why conifers are the main type of tree grown in Irish forests.
- (ii) Name a species of conifer commonly grown in Ireland.
- (iii) Why are forestry trees thinned at various times?
- (iv) State **two** beneficial effects of forestry on the environment.
- (d) (i) What is meant by the term *transpiration*?
- (ii) State **two** environmental factors that affect the rate of transpiration.
- (iii) Why is transpiration important in plants?
- (iv) Describe an experiment to demonstrate transpiration in a plant.

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