

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 



Coimisiún na Scrúduithe Stáit
State Examinations Commission

LEAVING CERTIFICATE EXAMINATION, 2003

AGRICULTURAL SCIENCE - ORDINARY LEVEL

Wednesday, 11 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

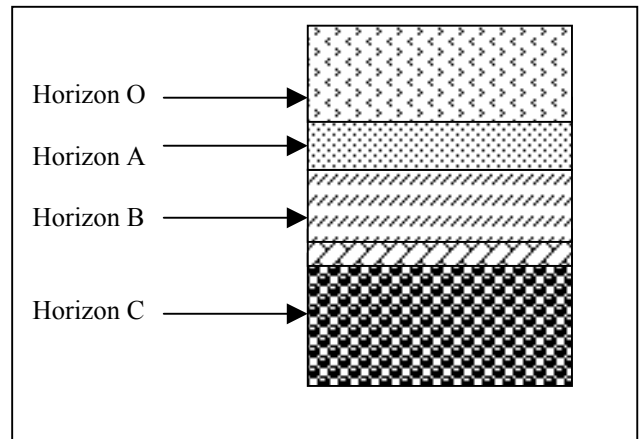
(120 marks)

Instructions

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

Question 1

This diagram is an illustration of the horizons in a **podzol** soil.



- (a) Name the **two** minerals involved in the formation of a podzol.
- 1 _____
- 2 _____
- (b) What common name is given to the soil found in the layer labelled horizon A in the diagram?
- _____
- (c) In what type of locations would you find podzols?
- _____
- _____
- (d) State **one** soil practice used to improve a podzol soil.
- _____
- _____

(20 marks)

Question 2

Complete the following table for food tests completed in the school laboratory. The first test has been completed as an example.

Food Type	Test Chemical(s)	Results - Colour Change
Starch	Iodine	Blue-black colour
Glucose	Benedict's or Fehling's Solution	
		Purple colour
Vitamin C	D.C.P.I.P. solution	

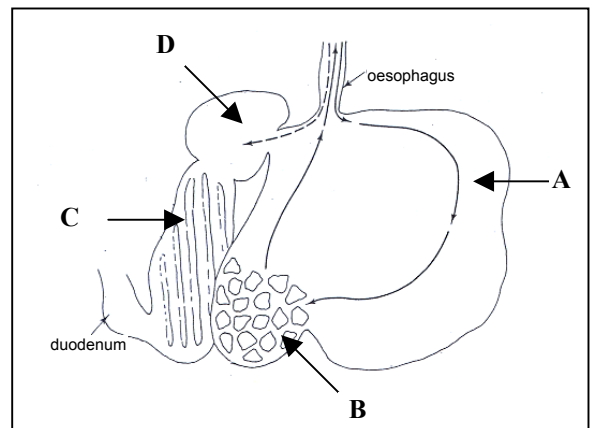
(20 marks)

Question 3

The diagram shows a **ruminant** stomach.

(a) Name the four chambers labelled;

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



From Advanced Biology, Simkins et al., Bell & Hyman Limited, 1956.

(b) Give **one** example of a farm animal that has this stomach type.

(c) Why is this stomach design so important to this animal?

(d) Name **one** substance present in the stomach that helps in the digestion of food.

(20 marks)

Question 4

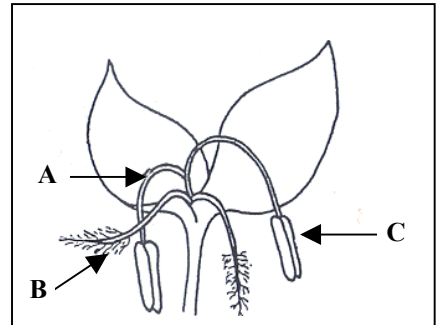
From your study of plant families, you learned that the flower is the reproductive shoot of the plant.

- (a) Name the parts labelled A and B on the diagram of a flower.

A _____

B _____

- (b) What is the function of part C?



- (c) State **two** ways in which a flower, developed for insect pollination, differs from the example given above.

1 _____

2 _____

(20 marks)

Question 5

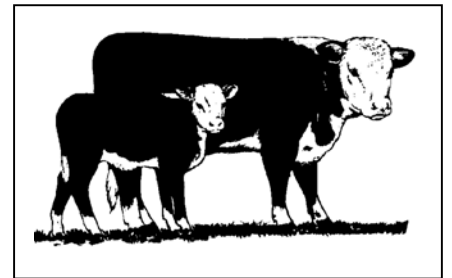
In caring for a newborn calf, the farmer has to perform certain tasks. Give **one** reason for each of the following.

- (a) Applying iodine to the navel _____

- (b) Feeding colostrum _____

- (c) Tagging the animal _____

- (d) Giving some hay to eat _____



(20 marks)

Question 6

The following list contains names of diseases found in crops and animals in Ireland. In each case state what type of micro-organism, **bacteria**, **fungus** or **virus** causes the disease.

Example

	Disease	Type of micro-organism
	Rust	Fungus
(a)	Orf	_____
(b)	Blight	_____
(c)	Blackleg	_____
(d)	Leaf roll	_____
(e)	Tuberculosis (TB)	_____

(20 marks)

Question 7

Indicate whether the following are true (T) or false (F), by placing a ring around the correct answer, as shown in the example.

Example:	Herbivores have no molar teeth	T	F
(a)	A potometer is used to measure transpiration in plants	T	F
(b)	White blood cells carry oxygen	T	F
(c)	The pituitary gland is found in the brain	T	F
(d)	Limestone is an igneous rock	T	F
(e)	Grasses belong to the family Gramineae	T	F
(f)	Chlorophyll is a pigment found in a green plant	T	F
(g)	Animal grazing will increase tillering	T	F
(h)	Adding lime to the soil will lower the pH	T	F
(i)	Gilts are female pigs which have not had their first litter	T	F
(j)	A bulb is an example of an underground stem	T	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.
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Question 8

- (a) Flushing and steaming up are **two** procedures involved in sheep production.
- Name **two** breeds of sheep found in Ireland.
 - Explain the underlined terms.
 - Give **one** benefit of **each** procedure to the farmer.
 - What length is the oestrous cycle in a sheep?
- (b) Oestrus can be *synchronised* artificially by the farmer.
- Explain how synchronisation is carried out on the farm.
 - State **one** benefit of synchronisation to the farmer.
 - How long is the gestation period in sheep?
- (c)
- Describe the management and feeding of bonhams from birth to weaning.
 - List **two** environmental conditions necessary for the rearing of weaners in a pig rearing unit.
 - Describe the feeding principles required for fatteners to slaughter.

(60 marks)

Question 9

- (a) (i) Copy the table below into your answer book. Complete the spaces in the table to show the factors necessary for growth and harvesting of the selected crops.

Crop Name	Root crop	Cereal crop
	Soil type needed	
pH of soil		
Type of seed bed		
Time of sowing		
Time of harvest		

- Describe the harvesting of both the root and cereal crop.
 - State (1) **two** conditions for the correct storage for each of the named root and cereal crop and (2) the need for rotation of the chosen crops.
- (b) Describe a laboratory investigation to determine the percentage germination of cereal seed.

(60 marks)

Question 10

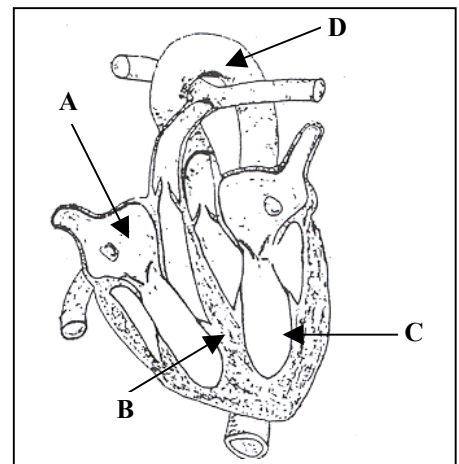
Answer any **two** parts, (a), (b), (c) or (d).

- (a) Soils contain many soil particles.
- List any **four** soil particles.
 - State **one** method of physical weathering and give a brief explanation of how it occurs.
 - Explain how the presence of earthworms is of benefit to the soil.
 - Describe with the aid of labelled diagrams a laboratory investigation to find the amount of air in a soil sample.
- (b) Direct sowing is one method of sowing a ley for grassland.
- Name **two** other methods of sowing a ley for grassland.
 - Describe **one** of the methods you have stated.
 - Outline the procedures involved for the correct harvest and storage of grass for hay.
- (c) Beef breeds are known for their size.
- Name any **two** breeds of beef cattle found in Ireland.
 - State **three** bodily confirmation characteristics of a beef breed.
 - Outline the feed and housing requirements of beef weanlings during their first winter.
- (d) With regard to fertilizers and manures on Irish farms;
- Name **four** types of fertilizers.
 - State **two** reasons why farmers use them.
 - Describe **three** methods of their application on the land.
 - Describe **three** precautions which are necessary to prevent problems with pollution associated with their application onto the land.

(60 marks)

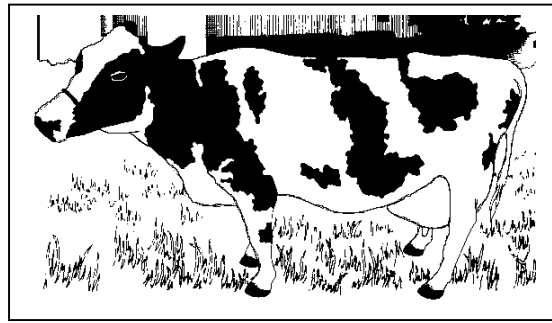
Question 11

- (a) Answer the following questions in relation to the body organ in the picture.
- Identify this body organ.
 - In what region of the body is this organ located?
 - Identify the parts labelled A, B, C and D.
 - What is the main function of this organ?
- (b) Lice and fleas are examples of ectoparasites and belong to the Phylum Arthropoda.
- State **two** reasons why they belong to this phylum.
 - Explain the underlined term.
 - Name **two** farm animals that might be infected with these animals.
 - Give another example of a parasitic organism of farm animals.
- (c) Describe with the aid of a labelled diagram a laboratory investigation to show that germinating seeds produce heat energy during respiration.



(60 marks)

Question 12

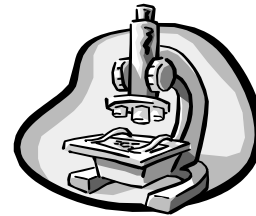


- (a) The picture is of a dairy cow.
- (i) State **four** reasons why cows need to be replaced in a dairy herd.
 - (ii) Explain the management of spring calving cows in early lactation.
 - (iii) Describe an investigation to assess the hygienic quality of milk.
 - (iv) Outline with the aid of diagrams the use of paddock grazing as a means of grassland management.
- (b) Give an explanation for **four** of the following statements.
- (i) The use of mineral licks on farms.
 - (ii) Keeping and maintaining some hedgerows on farms.
 - (iii) The presence of white clover in long-term leys.
 - (iv) A bovine animal having red coloured urine.
 - (v) The use of a "strip-cup" prior to milking.
 - (vi) The storage of bull semen at a particular temperature.

(60 marks)

Question 13

- (a)
 - (i) Draw a diagram of a simple animal cell (e.g. cheek cell), as seen under a light microscope. Label any **three** parts.
 - (ii) Where in this cell are the chromosomes found?
 - (iii) How many chromosomes are there in (1) human somatic cells and (2) human gametes?
 - (iv) Name the type of division that results in the halving of the chromosome number.



- (b) In corn plants, yellow seed (**YY**) is dominant to green seed (**yy**). A pure breeding (homozygous) yellow-seeded corn plant was crossed with a green-seeded corn plant. The offspring (**F1**) were heterozygous.

- (i) Explain the underlined terms.
- (ii) Copy the following into your answer book and complete the spaces (genotypes in brackets, phenotypes on lines), to outline the cross above.

The genotype of the original parents	(YY)	X	(yy)
The gametes produced by each parent	()	X	()
The genotype of the offspring (F1)	()		
The phenotype of the offspring (F1)	_____		

- (iii) The offspring of the above cross were crossed with a corn plant homozygous for green seed. Copy the following into your answer book and complete the spaces (genotypes in brackets, phenotypes on lines) to outline this cross.

The genotypes of the second generation parents	()	X	()
The gametes produced by each parent	()	()	X ()
The genotypes of the second generation	()	()	
The phenotypes of the second generation	_____		

(60 marks)

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