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 2018

AGRICULTURAL SCIENCE – ORDINARY LEVEL

MONDAY, 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 your answer book.

Total Marks: *300 marks.*

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

[OVER]

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) A soil sample is mixed with water in a graduated cylinder and allowed to settle as shown in the diagram.

(i) What soil component is found at A?

_____

(ii) What is the principal type of soil particle found in B?

_____

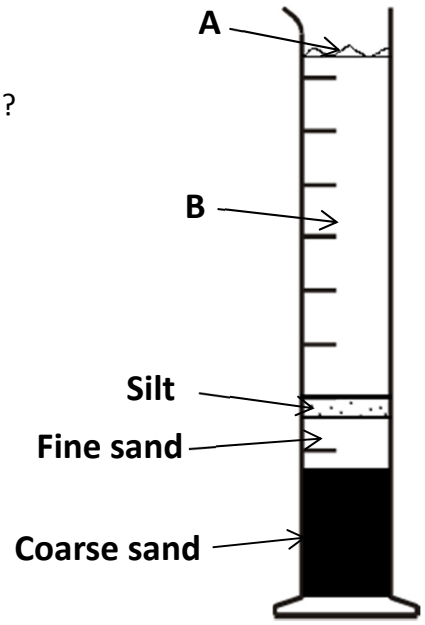
(iii) 1. Would this soil have poor or good drainage?

_____

2. Explain your answer.

_____

_____



(b) State **two** reasons for poor soil drainage.

(i) _____

(ii) _____

Question 2.

Complete the table below in relation to the length of gestation, mass of offspring at birth, and slaughter mass, of the pig and sheep.

	Pig	Sheep
Length of gestation		
Mass of offspring at birth (kg)		
Slaughter mass (kg)		

Question 3.

The three animals shown are involved in the life cycle of the liver fluke.

(a) From the animals shown, name the primary host.

_____

(b) From the animals shown, name the secondary (intermediate) host.

_____

(c) State **three** practices carried out on farms to reduce the incidence of liver fluke.

(i) _____

(ii) _____

(iii) _____

(d) Liver fluke is an endoparasite. Explain the term *endoparasite*.

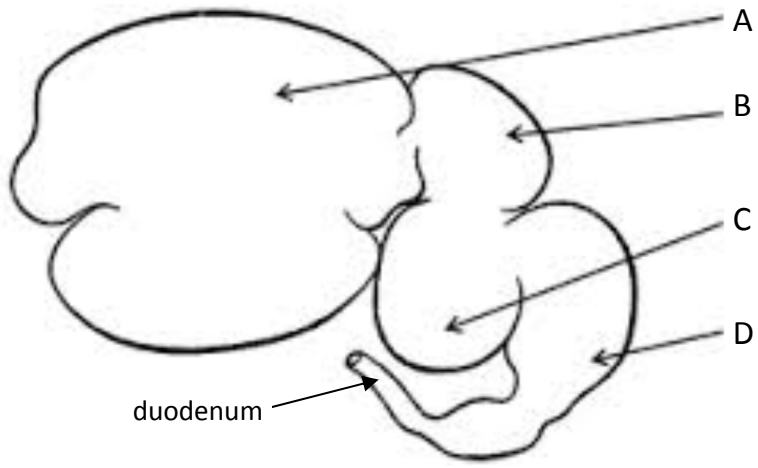
_____

(e) Give an example of **one** other endoparasite.

_____

Question 4.

The diagram shows the stomach of a ruminant farm animal.



(a) Name each labelled part of the stomach.

A. _____

B. _____

C. _____

D. _____

(b) State the role of part A and of part D.

Role of A: _____

Role of D: _____

(c) Name **two** farm animals with a ruminant stomach.

(i) _____

(ii) _____

(d) State **one** advantage to an animal of having a ruminant stomach.

_____

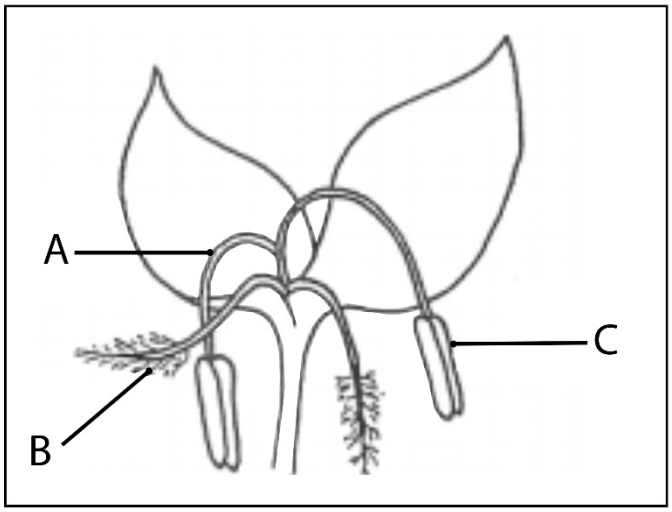
Question 5.

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

Example: **A cow is a carnivore.**		**T**	**F**
(a)	Cotyledons store food in seeds.	T	F
(b)	Grasses belong to the plant family *Compositae.*	T	F
(c)	Earthworms are parasites.	T	F
(d)	Resazurin solution is used to test the hygienic quality of milk.	T	F
(e)	The vena cava takes blood away from the heart.	T	F
(f)	Granite is an igneous rock.	T	F
(g)	Aphids (greenfly) spread viral diseases.	T	F
(h)	Respiration is the loss of water vapour from stomata in leaves.	T	F
(i)	Footrot is a notifiable disease.	T	F
(j)	Hereford is a dairy breed of cattle.	T	F

Question 6.

The diagram shows a grass flower.



(a) Name the parts labelled A and B.

A. _____

B. _____

What is the role of part C?

_____

(b) Grass is wind pollinated.
State **two** features of a grass flower that make it suitable for wind pollination.

(i) _____

(ii) _____

Question 7.

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

(a) Finding the pH of the soil before sowing a crop.

_____

_____

(b) Adding white clover to a seed mixture for a pasture sward.

_____

_____

(c) Topping pastures in summer.

_____

_____

(d) Using mineral licks on a dairy farm.

_____

_____

(e) Isolating sick animals on a farm.

_____

_____

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.

(a) Slurry and farmyard manure are two sources of nutrients for crops.

(i) State **two** differences between the composition of slurry and farmyard manure.

(ii) Slurry may cause water pollution. State **two** steps farmers may take to reduce the incidence of water pollution by slurry.

(b) 18-6-12 is a compound fertiliser used on farms.

(i) State the principal elements that 18-6-12 provides.

(ii) State **one** advantage and **one** disadvantage of using artificial fertilisers.

(iii) In the case of **one** named element in 18-6-12, state its role in plants.

(c) Describe an experiment to find the percentage (%) of water in a soil sample.

Question 9.

(a) (i) Name **two** varieties of maincrop potatoes.

(ii) Describe the growing of potatoes under the following headings:

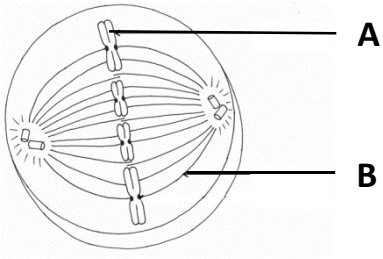
1. Soil preparation
2. Fertiliser use
3. Weed control
4. Potato blight control.

(b) State **three** reasons why farmers would use certified seed potatoes.

(c) Describe an experiment to estimate the yield of a potato crop prior to harvesting.

Question 10.

(a) The diagram shows a cell dividing by mitosis.



(i) Name the parts labelled A and B.

(ii) Name the stage of mitosis shown.

(iii) Name the stage of mitosis that comes immediately before the stage shown in the diagram.

(b) Mitosis is involved in the production of clones.

(i) What is a clone?

(ii) Name **one** crop that may be produced by cloning.

(c) The allele for round pea seeds (R) is dominant over the allele for wrinkled pea seeds (r).

Copy and complete the following in your answer book to show a cross between a plant with pure-breeding round seeds and a plant with wrinkled seeds.

Genotypes of parents ( ) × ( )

Gametes produced ( ) × ( )

Genotype of offspring ( )

Phenotype of offspring _____

(d) The plants produced from the above cross were allowed to self-pollinate.
Copy and complete the following in your answer book to show the self-pollination cross.

Genotype of parents ( ) × ( )

Possible gametes ( ) ( ) × ( ) ( )

Genotypes of offspring ( ) ( ) ( )

Phenotypes of offspring _____ _____

Question 11.

(a) Farmers can sow either spring barley or winter barley.

Copy and complete the following table in your answer book.

	Spring barley	Winter barley
Month of sowing		
Month of harvesting		
Yield (tonnes/ hectare)		

(b) State **two** differences between the cultivation and harvesting of feeding barley and malting barley.

(c) Describe **two** features of barley that show it is ready for harvesting.

(d) The larvae of the click beetle and the crane fly cause damage to cereal crops.

(i) Name the larva of the click beetle.

(ii) Name the larva of the crane fly.

(iii) Name **one** disease of cereal crops **and** state how it is prevented or controlled.

(e) Describe how to find the percentage (%) germination of a sample of barley seeds.

Question 12.

(a) (i) Draw a labelled diagram of a paddock grazing system.
(ii) State **one** advantage of a paddock grazing system.
(iii) State **one** disadvantage of a paddock grazing system.

(b) Describe **three** steps involved in making good quality hay, **and** give the reason for each step.

(c) State how a farmer can ensure the production of good quality silage.

(d) List **three** simple tests a farmer can carry out to determine the quality of silage, **and** state the purpose of each test.

Question 13.

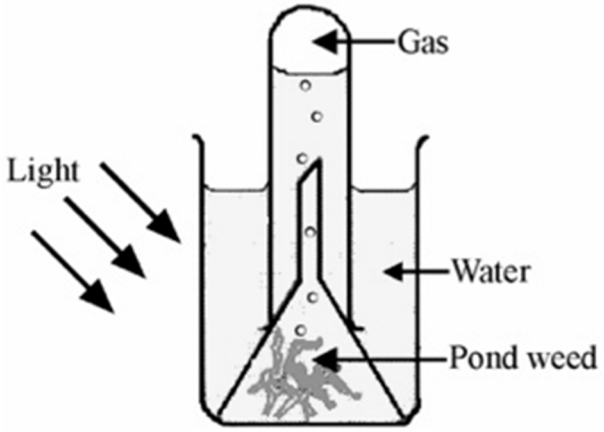
Answer any **two** of the parts (a), (b), (c), (d). **(30 marks, 30 marks)**

(a) (i) Name **two** lowland sheep breeds.

(ii) Explain **each** of the following terms **and** state why each procedure is carried out on sheep farms.

1. Flushing
2. Scanning
3. Steaming up
4. Vaccination
5. Creep feeding
6. Shearing.

(a) The diagram shows an investigation into photosynthesis.



(i) Name the gas collected in the test tube.
(ii) Name **two** factors necessary for photosynthesis.
(iii) How does photosynthesis help to reduce the problem of climate change?
(iv) Starch is stored in leaves as a result of photosynthesis.
Describe how to test a leaf for the presence of starch.

(c) Describe the management of dairy calves under the following headings.

(i) Care at birth
(ii) Housing
(iii) Disease prevention
(iv) Introducing hay into their diet
(v) Use of milk replacer.

(d) (i) Draw a labelled diagram of a molar tooth.
(ii) State the function of the incisors **and** of the molars in a farm animal.
(iii) Name **two** other types of tooth found in farm animals.
(iv) Give the dental formula for a pig **or** a sheep.

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