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Coimisiún na Scrúduithe Stáit State Examinations Commission

LEAVING CERTIFICATE EXAMINATION, 2012

AGRICULTURAL SCIENCE - ORDINARY LEVEL

THURSDAY, 21 JUNE – MORNING, 9.30 – 12.00

For the use of the Superintendent only

Centre Stamp

THERE ARE TWO SECTIONS IN THIS EXAMINATION PAPER

Section One Answer any **six** questions from this section.
Each question carries 20 marks.
Write your answers in the spaces provided on **this examination paper**.

Section Two Answer any **three** questions from this section.
Each question carries 60 marks.
Write your answers in the **answer book**.

Total Marks: 300 marks.

It is recommended that you spend not more than 45 minutes on Section One, leaving 105 minutes for Section Two.

You must return this examination paper with your answer book at the end of the examination.

SECTION ONE

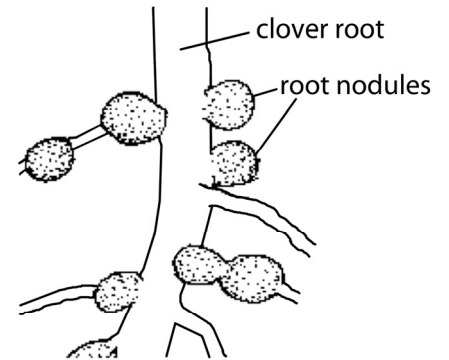
(120 marks)

Instructions

- Answer any **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 on page 1.

Question 1.

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



- (a) What type of organism do these nodules contain?

- (b) State **one** function of the organisms referred to in (i).

- (c) In the spaces below, **draw and name** the piece of equipment normally used in a laboratory to transfer the organisms referred to in (i) onto an agar plate.

<u>Drawing</u>



<u>Name</u>

- (d) Give **one** reason for using clover in grass seed mixtures.

(20 marks)

Question 2.

Complete the table below in relation to the animals shown in the photographs.

		
(a) Name of animal.		
(b) Phylum to which animal belongs.		
(c) One characteristic of a member of the phylum.		
(d) Importance in agriculture.		

(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: The lungs are involved in gas exchange.

T F

(a) Aberdeen Angus cattle are black and white.

T F

(b) Sitka spruce is grown in most commercial forests in Ireland.

T F

(c) Granite is an igneous rock.

T F

(d) Dandelion belongs to the family *Gramineae*.

T F

(e) Soil pH is a measure of the phosphate level in a soil.

T F

(f) Liver fluke belongs to the phylum *Nematoda*.

T F

(g) The gestation period in pigs is three months, three weeks and three days.

T F

(h) Benedict's solution is used to test for starch.

T F

(i) A line transect is used in ecological studies.

T F

(j) Anaemia is a common disease in pigs.

T F

(20 marks)

Question 4.

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

(a) Rolling the seedbed after sowing seed. _____

(b) Male cattle are usually castrated. _____

(c) Housing cattle during the winter. _____

(d) Sheep are sheared in summer. _____

(e) Trees in a forestry plantation are thinned. _____

(20 marks)

Question 5.

State the **precise location** of each of the following parts in the body of a mammal.
The first one has been completed as an example.

Body part	Location
Atrium	Heart
(a) Trachea	
(b) Humerus	
(c) Ureter	
(d) Duodenum	
(e) Cerebellum	

(20 marks)

Question 6.

Match **each** plant structure from the following list with a description in the table.
The first one has been completed as an example.

List: root hairs; xylem; **phloem**; carpels; stomata; stamens.

Plant structure	Description
Phloem	Carries products of photosynthesis.
(a)	Male parts of flowers.
(b)	Carries water from the roots.
(c)	Allow gas exchange in leaves.
(d)	Absorb water from the soil.
(e)	Female parts of flowers.

(20 marks)

Question 7.

(a) Give the recommended temperature for **each** of the following in relation to pig housing:

- (i) Creep area. _____
- (ii) Weaner house. _____
- (iii) Fattener house. _____

(b) Why do bonhams have their teeth clipped soon after birth?

(c) Give the approximate weight at which pigs are finished for slaughter.

(20 marks)

[OVER

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) (i) Name **three** common sheep breeds.
- (a) (ii) Name **two** parasites of sheep.

- (b) (i) State **three** advantages of housing sheep at lambing time.
- (b) (ii) Describe **four** sheep management practices prior to and at mating time.

- (c) (i) Describe the diet of the lamb from birth to slaughter.
- (c) (ii) What is the normal weight in kilograms at which lambs are slaughtered?

(60 marks)

Question 9.

- (a) (i) Name **two** common varieties of potato.
- (a) (ii) Describe the cultivation of potatoes under the following headings:
 - 1. Seed bed preparation.
 - 2. Control of a **named** disease.
 - 3. Weed control.
 - 4. Harvesting.

- (b) (i) First early potatoes are usually grown in coastal areas of the east and south of Ireland. Give **two** reasons why these areas are suitable for early potato production.
- (b) (ii) Crop rotation is an important feature of potato cultivation. Give **two** reasons why crop rotation is important.

- (c) Describe an experiment to find the dry matter (DM) content of potatoes.

(60 marks)

Question 10.

- (a) (i) Give the names of **two** breeds of cattle commonly used in **milk** production.
(ii) Give the names of **two** breeds of cattle commonly used in **beef** production.
- (b) Read the following paragraph on dairy farming and, **in your answer book**, match **each** capital letter with the correct number of days from the list below.

List: 37 days; 21 days; 60 days; 282 days; 4 days; 305 days.

Cows are in heat or 'bulling' every ___A___ days. The cow is pregnant or 'in-calf' for ___B___ days. After calving the cow produces a special type of milk called colostrum for about ___C___ days. The cow produces milk for an average of ___D___ days in the year. The cow reaches her peak milk yield about ___E___ days after calving. The cow should be 'dried-off' about ___F___ days before the birth of the next calf.

- (c) Calving is a very important event on the dairy farm.
List **four** steps to help ensure successful calf rearing **or** successful replacement heifer rearing.
- (d) Describe any **two** ways to ensure good hygiene during milking and milk storage.

(60 marks)

Question 11.

- (a) Name **two** grass species that are commonly used in grass seed mixtures.
- (b) Tillering of young grass plants is important in establishing a good grass sward.
- (i) What is meant by the term *tillering*?
(ii) Describe **two** ways by which the farmer can encourage tillering.
- (c) *Paddock grazing* and *set stocking* are two grazing systems.
With the aid of labelled diagrams, explain **both** of these systems.
- (d) Compare hay and silage under the following headings:
- (i) Method of preservation.
(ii) Digestibility.

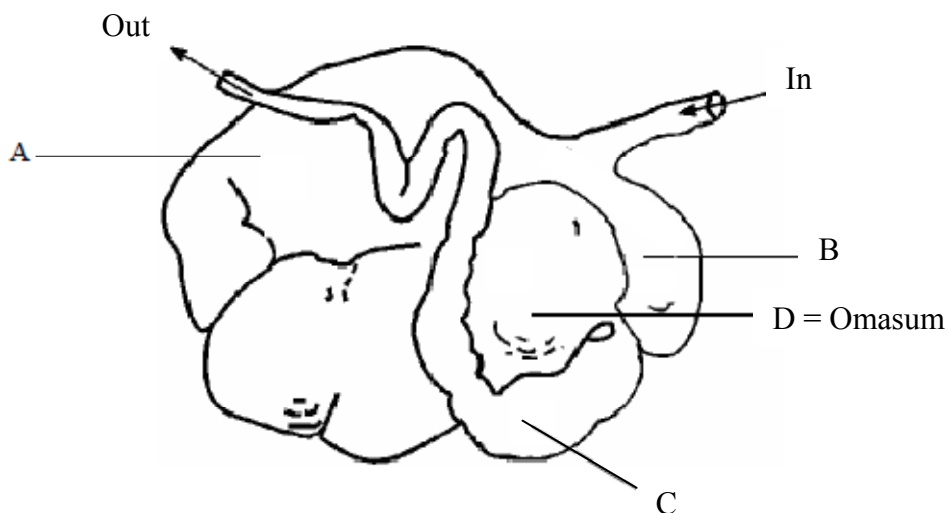
(60 marks)

Question 12.

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

(30, 30)

- (a)
- (i) Describe **three** features of good winter housing for weanlings.
 - (ii) Give the approximate live weight for cattle at the following stages of the two-year 'calf-to-beef' system:
 1. First winter housing.
 2. Slaughter.
 - (iii) At slaughter the beef carcass is graded for conformation and fatness. Explain **each** underlined term.
- (b)
- (i) Explain the terms *soil texture* and *soil structure*.
 - (ii) Give **two** characteristics of **each** of the following soil texture types:
 1. Sandy soil.
 2. Loam soil.
 3. Clay soil.
 - (iii) Describe an experiment to estimate the percentage clay in a soil sample.
- (c) The diagram below shows the ruminant stomach.



- (i) Explain the term *ruminant*.
 - (ii) Name the parts labelled A, B, C from the diagram. (Part D is already labelled).
 - (iii) Explain what happens in part A of the stomach.
 - (iv) Which chamber of the stomach is used first by calves and lambs?
- (d) Give a scientific explanation for **each** of the following:
- (i) The use of a farrowing crate for a sow.
 - (ii) Creep feeding of calves.
 - (iii) Using a mixture of tree species in shelter belts.
 - (iv) White patches on the leaves of barley plants.
 - (v) Higher numbers of fluke in the livers of sheep grazing on wet land.

Question 13.

(a) Explain **each** of the following terms:

- (i) Diploid.
- (ii) Incomplete dominance.
- (iii) Progeny testing.

(b) In pea seeds the allele for round seeds (R) is dominant over the allele for wrinkled seeds (r).

A pea plant, homozygous for round seeds (RR), was crossed with a pea plant homozygous for wrinkled seeds (rr). The offspring (F1) were heterozygous.

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

Genotypes of parents (RR) × (rr)

(i) Gametes () × ()

(ii) Genotype of offspring (F1) ()

(iii) Phenotype of offspring (F1) _____

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

Show:

(i) Genotypes of parents () × ()

(ii) Gametes () × () ()

(iii) Genotypes of offspring () ()

(iv) Phenotypes of offspring _____

(d) Fruit flies (*Drosophila*) are widely used when studying genetics. Give **three** reasons for this.

(60 marks)

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