

AN ROINN OIDEACHAIS AGUS EOLAÍOCHTA

LEAVING CERTIFICATE EXAMINATION, 2001

AGRICULTURAL SCIENCE — HIGHER LEVEL

WEDNESDAY, 13 JUNE — AFTERNOON 2.00 to 4.30

SIX QUESTIONS TO BE ANSWERED

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1. Answer **any six** of the following:

- (a) Distinguish between (i) blanket and (ii) basin peats.
- (b) Give an example of a fungus for each of the following:
 - (i) an animal pathogen, (ii) a plant pathogen.
- (c) State a function for each of the following plant tissues:
 - (i) xylem, (ii) collenchyma, (iii) phloem.
- (d) Explain the term “tillering” and outline the conditions which promote it.
- (e) Why is the use of ground rock phosphate as a straight fertiliser in Ireland confined almost entirely to forest-tree fertilisation?
- (f) Name the stomach compartments of a named ruminant.
- (g) List **two** characteristics of any named organism belonging to the Phylum Annelida.
- (h) Explain how an application of lime helps to reduce the incidence of liver fluke.
- (i) Mention the plant families to which each of the following belongs:
 - (i) potato, (ii) daisy, (iii) crested dogtail, (iv) buttercup.
- (j) State **two** functions of the lymphatic system.

(60 marks)

2.

Soil Type	% Water at Field Capacity	% Water at Wilting Point	Available Water Capacity
Sandy	8	3	
Loam	22	11	
Clay	28	19	

- (a) Using the table above answer the following:
 - (i) Copy the table into your answerbook and complete the blank column.
 - (ii) Explain which of the above soils would best support crop growth (1) during a drought and (2) in early spring.
- (b) Explain the terms (i) field capacity and (ii) permanent wilting point.
- (c) Describe, with the aid of a diagram, an experiment to compare the drainage of sandy and clay soils.

(48 marks)

3. (a) Describe a laboratory investigation to show that germinating seeds release energy.
- (b) (i) Distinguish between aerobic and anaerobic respiration.
(ii) Which cell organelle is responsible for respiration?
- (c) Explain, with the aid of a diagram, how the internal structure of a grass leaf facilitates the process of photosynthesis.

(48 marks)

OR

3. (a) Write brief notes on **each** of the following:
- (i) crop rotations,
 - (ii) transpiration,
 - (iii) translocation,
 - (iv) embryo transplantation.
- (b) Explain the contrasting approaches used in the conservation of grass for winter feed as
- (i) silage, (ii) hay.
- (c) Distinguish between the treatments used to improve the digestibility of cereal grains used as a foodstuff for
- (i) cows, (ii) pigs.

(48 marks)

4. Describe a laboratory or field method used to determine **any two** of the following:

- (a) Cation exchange in a sample of soil.
- (b) The importance of **two named** elements for normal plant growth.
- (c) The diversity of plant life found in an old meadow.
- (d) The energy value of a named foodstuff.

(48 marks)

5. (a) Describe a feeding regime for lambs from birth to slaughter at about four months.
- (b) For a named farmed species compare the disease pressures in animals raised indoors and outdoors.
- (c) Discuss the rearing of a spring-born calf out on grass under the following headings:
- (i) disease control,
 - (ii) growth rate,
 - (iii) feeding principles.

(48 marks)

6. (a) Outline the features of a well-managed two-year “calf-to-beef” system.
- (b) Describe the precautions necessary to minimise the mortality rate of cows at the time of calving.
- (c) Describe the cultivation of any named tillage crop under each of the following headings:
- (i) soil suitability,
 - (ii) seed-bed preparation,
 - (iii) fertiliser requirements,
 - (iv) yield per hectare.

(48 marks)

7. (a) In poultry, feathered legs (**FF**) are dominant over clean legs (**ff**) and white plumage (**WW**) is dominant over black plumage (**ww**). What will be the genotypes and phenotypes of the offspring of each of the following crosses?
- (i) FFWW x ffww
 - (ii) FFww x ffWW
 - (iii) FfWw x FFWW
- (b) Explain each of the following:
- (i) crossing-over during meiosis,
 - (ii) incomplete dominance,
 - (iii) continuous variation within a population of organisms,
 - (iv) multiple alleles.

(48 marks)

8. Answer **any two** of the following:

- (a) Discuss the importance of clover in a pasture under the following headings:
- (i) nitrogen status of the soil,
 - (ii) ground cover by vegetation,
 - (iii) nutrient value of the herbage,
 - (iv) ground water pollution.
- (b) Discuss, with the aid of a diagram, how the element carbon is recycled in nature.
- (c) State **four** factors which influence the composition of cow’s milk.

(48 marks)

9. Give a scientific explanation for **any four** of the following:

- (a) The presence of a red colour in the urine of a bovine animal.
- (b) A large population of rushes and sedges in grassland overlying a gley soil.
- (c) The necessity to allow sugar beet tops to wilt for about a week before feeding them to livestock.
- (d) A variation in the concentration of carbon dioxide in the atmosphere during a warm sunny day.
- (e) Milking cows more frequently than twice daily increases their yields over a lactation period.

(48 marks)

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