

AN ROINN OIDEACHAIS AGUS EOLAÍOCHTA

LEAVING CERTIFICATE EXAMINATION, 2000

AGRICULTURAL SCIENCE - HIGHER LEVEL

WEDNESDAY, 14 JUNE - AFTERNOON 2.00 - 4.30

SIX QUESTIONS TO BE ANSWERED

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

- (a) State two characteristics which assist in identifying a grass species.
- (b) State where each of the following is located in the animal body; sperm, thyroid gland, spleen, colon.
- (c) Name two plant mineral nutrients that are available following decomposition of organic matter in the soil.
- (d) State which phylum each of the following belongs to: earthworm, aphid, liver fluke, *Babesia*.
- (e) Draw a labelled diagram to show each of the following parts of the bread mould fungus *Mucor*: mycelium, sporangium, hypha.
- (f) Name the parts of the flower that form: (i) the calyx, (ii) the corolla.
- (g) Explain what is meant by condition scoring of cows.
- (h) Describe two characteristics of a podzol.
- (i) Explain briefly how crop rotation helps the practice of weed control in tillage.
- (j) Describe the characteristics of a temporary ley.

(60 marks)

- 2.
- (a) Explain how the texture and structure of a soil influences how often it needs to be limed.
 - (b) Describe a laboratory test to determine the pH of a soil. Explain how an application of lime raises the pH of a soil.
 - (c) Describe the difference between nitrification and denitrification.

(48 marks)

3. (a) Describe the practices used in good grassland management to achieve the following: (i) weed control (ii) a high yielding grass sward.
- (b) State the principal factors which influence the quantity and quality of foodstuffs fed to a named farm animal.
- (c) Name four of the principal constituents in a named farm foodstuff and describe the function of each of the constituents you name.

(48 marks)

OR

3. (a) Write notes on **two** of the following:
- (i) the principal factors which contribute to calf mortality on a farm,
 - (ii) a feeding programme for cows during their dry period,
 - (iii) caring for a newborn lamb.
- (b) Explain how the growth habit and production of a grass sward changes over the growing season.
- (c) State the principal management practices used to ensure good establishment following the reseeding of a pasture.

(48 marks)

4. Describe a laboratory method used to determine any **two** of the following:
- (i) the role of earthworms in a soil,
 - (ii) the role of amylase in the digestion of starch,
 - (iii) the effect of an additive on ensiled grass,
 - (iv) the leaching of mineral nutrients in a soil.

(48 marks)

5. (a) Describe, with the aid of a labelled diagram, the pathway taken by food in a ruminant animal during digestion.
- (b) Describe the soil and nutritional requirements for the production of a named root or cereal crop.
- (c) Explain how management and environmental factors may influence the growth and development of pigs **or** sheep in an enterprise with which you are familiar.

(48 marks)

6. (a) Explain why good bodily characteristics are desirable in new breeding stock in a named farm animal enterprise.
- (b) Explain how controlled grazing helps to conserve the quality of a ley.
- (c) Give three reasons which may contribute to a high incidence of lodging in a named cereal crop.
- (48 marks)**

7. (a) Explain each of the following: phenotype, back-cross, allele.
- (b) Explain why Mendel selected pea plants in his experiments on heredity.
- (c) Use labelled diagrams to show the difference between mitosis and meiosis.
- (d) In maize seeds smooth kernel (K) and starchy endosperm (S) are both dominant traits. A plant which is homozygous dominant for both traits is crossed with a plant which is heterozygous for both traits. State the phenotype and genotype of the seeds on a plant resulting from this cross.
- (48 marks)**

8. Answer **any two** of the following:
- (a) Using labelled diagrams, compare and contrast the structure of named monocotyledonous and dicotyledonous stems.
- (b) Design an experiment to compare the growth rate of sugar beet plants in varying situations in a field.
- (c) Explain how you would show in the laboratory the effects of a deficiency of a mineral element on the growth of a plant.
- (48 marks)**

9. Give a scientific explanation for **any four** of the following:
- (a) The failure of plants to produce starch in a nitrogen-filled atmosphere.
- (b) A greater loss of energy by farm animals kept out of doors during the winter months in comparison to those housed indoors.
- (c) A variation in the height of the water table in a field during the year.
- (d) A low incidence of liver fluke in cattle grazing on a well drained pasture.
- (e) A slow rate of transpiration from plants during humid weather.
- (48 marks)**