

AN ROINN OIDEACHAIS AGUS EOLAÍOCHTA

LEAVING CERTIFICATE EXAMINATION, 1999

AGRICULTURAL SCIENCE - HIGHER LEVEL

WEDNESDAY, 16 JUNE - AFTERNOON 2.00 - 4.30

3630

SIX QUESTIONS TO BE ANSWERED

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

- (a) State two differences between plant and animal cells.
- (b) Name one animal organism of agricultural importance from within each of the following phyla; Annelida, Mollusca, Arthropoda.
- (c) Mention one mineral plant nutrient contained in each of the following; pig slurry, limestone.
- (d) Classify each of the following rocks; granite, marble, basalt.
- (e) Use a labelled diagram to show each of the following parts of the bread mould fungus *Mucor* : mycelium, sporangium, hyphae.
- (f) Mention two characteristics of a flower on a plant classified in the family Compositae.
- (g) Use a labelled diagram to show the location of the awn in a barley seed.
- (h) List three characteristics of certified seed.
- (i) List two reasons why it is advisable to practice crop rotation on a tillage farm.
- (j) Describe the characteristics of permanent grassland.

(60 marks)

2. (a) Outline the procedures you would use in the laboratory to compare the structure and composition of samples of soil taken from different locations on a tillage farm.
- (b) Describe three beneficial effects of applying a compound containing the element calcium to a soil.
- (c) List four factors which influence the drainage and aeration of a soil.

(48 marks)

3. (a) Mention the advantages to a farmer of producing silage in round bales as compared to wedge clamping in a silo.
- (b) Explain how the percentage moisture in grass at ensiling may influence each of the following;
- (i) quality of the silage,
 - (ii) effluent production.
- (c) Describe the factors which influence the decision relating to the level of grazing and the amount of hay or silage to be produced on a farm.

(48 marks)

OR

3. (a) Write notes on **two** of the following :
- (i) Optimum environmental conditions in a pig farrowing unit.
 - (ii) Winter storage of cereals on a farm.
 - (iii) Hygiene and disease control in a milking parlour.
- (b) Explain how the Food Conversion Ratio (FCR) in a pig production unit is influenced by each of the following ;
- (i) breed
 - (ii) diet
- (c) Distinguish between the management and feeding practices used for weaners and for fatteners in a pig production unit.

(48 marks)

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

- (i) The presence of bacteria in milk.
- (ii) Capillarity in a plant stem.
- (iii) The action of a named animal enzyme.
- (iv) The sugar content of beet in varying weather conditions.

(48 marks)

5. (a) Explain how the systems of housing and feeding spring born calves may change between the first and second over-wintering periods.
- (b) Describe, with the aid of a simple diagram, the variation in the conformation characteristics of named breeds of beef and dairy cows.
- (c) Describe the advantages of allowing a reasonable rest period between the end of lactation and subsequent calving in the case of a dairy herd.

(48 marks)

6. (a) Explain why a rotational grazing system may be more productive than a set-stocking system in a beef rearing enterprise.
- (b) Describe a field investigation you carried out to examine the effects of grazing on the growth of a range of desirable plants in permanent grassland.
- (c) Explain why food concentrates are included in the diet of almost all farm animals. **(48 marks)**
7. (a) Explain each of the following : centrosome, genotype, hybrid.
- (b) Explain Mendel's second law of inheritance using a suitable dihybrid cross.
- (c) Describe, using a suitable example, the importance of the practice of back-crossing in genetics. **(48 marks)**
8. Answer any **two** of the following:
- (a) Using a labelled diagram compare and contrast the structure of named monocotyledonous and dicotyledonous stems.
- (b) Design a field or laboratory experiment to compare the rate of absorption of water by plants.
- (c) Explain how you would estimate the yield in tonnes per hectare of ware potatoes **or** of sugar beet at the time of harvesting. **(48 marks)**
9. Give a scientific explanation for **any four** of the following:
- (a) A low percentage rate of establishment in a field of winter barley.
- (b) The production of gases in a slurry tank.
- (c) A variation in the number and size of the sprouts on potatoes exposed to a range of temperatures in the laboratory.
- (d) A high incidence of tussocks of unproductive grasses in a pasture sward.
- (e) A lower water content in food as it passes into the abomasum of a ruminant animal. **(48 marks)**