

**AN ROINN OIDEACHAIS AGUS EOLAÍOCHTA**

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**LEAVING CERTIFICATE EXAMINATION, 1999**

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**AGRICULTURAL SCIENCE - ORDINARY LEVEL**

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**WEDNESDAY, 16 JUNE - AFTERNOON 2.00 - 4.30**

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2289

**SIX QUESTIONS TO BE ANSWERED**

1. Answer any six of the following :
- (a) Mention two characteristics of a gley soil.
  - (b) State three reasons why grass is used as a farm animal foodstuff.
  - (c) Explain why aphids are controlled in potato 'seed' production.
  - (d) Explain the term 'leader-follower' as a grazing system.
  - (e) State two reasons why fertilisers may become unavailable to plants following spreading in the spring.
  - (f) State the principal constituents in a soil.
  - (g) Name the method by which potatoes are normally propagated.
  - (h) Explain the term symbiosis.
  - (i) Name the organisms present in the root nodules of a leguminous plant.
  - (j) Explain why a calf is unable to digest concentrate ration at a very early age.
- (60 marks)**
2. (a) Explain how any two named soil organisms assist in improving soil conditions.
- (b) Outline the advantages of a high content of organic matter in a soil.
- (c) Explain how an application of limestone to a soil may improve the health and growth rate of plants.

**(48 marks)**

3. (a) Describe any three factors which influence the annual milk yield of a dairy herd.
- (b) Mention the principal constituents of milk.
- (c) Describe a laboratory investigation you carried out to show the presence of micro-organisms in any named food substance.

**(48 marks)**

**OR**

3. (a) Explain why cattle and sheep are classified as ruminants.
- (b) Use a labelled diagram to describe the structure of a sheep's heart.
- (c) Distinguish between the feed requirements for maintenance and for production of farm animals.

**(48 marks)**

4. (a) Explain why protein is included in foodstuffs for farm animals.
- (b) State three factors which may influence the physical condition of a named one-year old farm animal.
- (c) Describe a system of beef production with which you are familiar.

**(48 marks)**

5. (a) Describe the factors which influence the quality and quantity of hay or silage produced on a farm.
- (b) Describe any two systems of grazing used in a sheep or cattle farm enterprise.
- (c) Describe a field investigation you carried out to determine the benefits of a named fertiliser on a grass sward or a cereal crop.

**(48 marks)**

6. (a) Outline the importance of good management during the establishment and growth of top quality root or cereal crops on a farm.
- (b) Explain how you would estimate the yield per hectare of a named tillage crop.
- (c) Explain why a high dry matter content, at the time of harvesting, is desirable in a tillage crop.

**(48 marks)**

7. (a) Explain each of the following terms : ovulation, gene, allele.

(b) In peas, round seeds (**RR**) are dominant over wrinkled seeds (**rr**).

State the genotype and phenotype of the seeds resulting from each of the following crosses;

(i) a homozygous round-seeded plant crossed with a heterozygous round-seeded plant.

(ii) a heterozygous round-seeded plant with a wrinkled-seeded plant.

(c) Seed catalogues have many examples of *F1* hybrids. Give an example of such a plant and what benefit it is in agriculture.

**(48 marks)**

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

(a) Explain how any three named environmental factors may influence the health and growth of bonhams or lambs.

(b) Outline a feeding programme for bonhams or lambs from birth to weaning stage.

(c) List three mineral elements and three vitamins and state the function of one mineral and one vitamin in the animal body.

**(48 marks)**

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

(a) Failure of a large number of seeds to germinate in a field with a high watertable.

(b) A colour change in iodine when added to a solution extracted from a potato tuber.

(c) Rapid growth of the stems in seedlings in the period following germination.

(d) Osmosis in the root hairs of plants.

(e) A high incidence of liver fluke in cattle grazing on wet land.

**(48 marks)**