



**Coimisiún na Scrúduithe Stáit
State Examinations Commission**

LEAVING CERTIFICATE EXAMINATION, 2011

AGRICULTURAL SCIENCE - HIGHER LEVEL

THURSDAY, 23 JUNE – MORNING, 9.30 – 12.00

SIX QUESTIONS TO BE ANSWERED

[OVER]

1. Answer any **six** of the parts (a) – (j).

- (a) Compare the structure of the flowers of **named** examples from the Rosaceae and the Cruciferae families.
- (b) (i) What is meant by *condition scoring* in cows?
(ii) Give the recommended condition scores for a dairy cow at service **and** at calving.
- (c) Explain the difference between active and passive immunity **and** give **one** example of each from agriculture.
- (d) List **three** practices that would increase the population of earthworms in farmland.
- (e) Describe how a farmer provides for optimal seed germination **and** crop establishment.
- (f) Name **one** monosaccharide **and one** polysaccharide found in grass **and** list the **three** main elements found in these compounds.
- (g) (i) Name **one** member of **each** of the phyla Platyhelminthes and Arthropoda.
(ii) Identify **one** disease of cattle caused by **each** member of the phyla you have named.
- (h) (i) Explain the term *symbiosis*.
(ii) Give **two** examples of symbiosis from agriculture.
- (i) Describe how you would identify limestone as a parent material in a soil.
- (j) Distinguish between a stolon (runner) and a rhizome **and** give **one** example of **each** from agriculture.

(60 marks)

- 2.
- (a) (i) Name **one** type of soil pan.
(ii) Outline how the named soil pan is formed.
(iii) State **one** problem associated with the named soil pan.
(iv) Say how the named soil pan could be removed.
 - (b) (i) Describe gleisation **and** its role in the development of a soil profile.
(ii) Explain the factors to be considered when collecting soil samples for analysis.
 - (c) Describe an experiment to investigate the presence of nitrogen in a soil sample.

(48 marks)

Option One

3. (a) Compare summer grazing and winter fattening as systems for finishing beef animals.
- (b) Describe **four** qualities a farmer would look for when selecting replacement heifers for a dairy herd.
- (c) Food Conversion Efficiency (FCE) decreases with age in farm animals.
- (i) Explain the underlined term **and** give an example of FCE for a **named** farm animal.
- (ii) Explain why FCE decreases with age in an animal.
- (iii) Explain how a farmer might improve the FCE of his herd.
- (48 marks)**

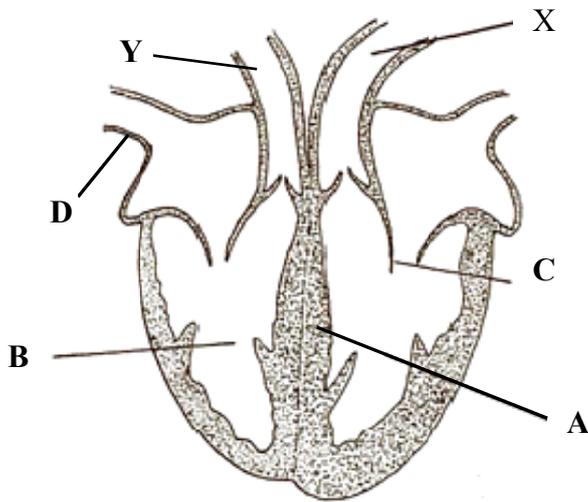
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Option Two

3. (a) Describe **four** grassland management practices used to achieve high quality silage.
- (b) (i) Explain why a young animal should receive colostrum in the first day of life.
(ii) List **three** benefits of colostrum to the young animal.
- (c) (i) Outline the main features of strip-grazing.
(ii) Give **two** advantages **and two** disadvantages of strip grazing in the feeding of fodder roots to sheep.
- (48 marks)**
4. Describe a laboratory or field experiment for any **two** of the following:
- (a) to determine the dry matter content of different potato varieties
- (b) to determine the hygienic quality of milk
- (c) to demonstrate soil flocculation
- (d) to demonstrate the effects of grazing on the botanical composition of grassland.
- (48 marks)**

[OVER]

5. (a) (i) Name the disease caused by a lack of iron in the diet of an animal.
(ii) Discuss the role of iron in the blood.
(iii) Mention **one** way of preventing iron deficiency in livestock.
- (b) This diagram shows a dissected mammalian heart.



- (i) Name the parts labelled A, B, C, D.
(ii) State the destination of the blood flowing
1. in X
2. in Y.
(iii) State the key characteristic of the blood
1. in X
2. in Y.

- (c) Red water fever in cattle is caused by a parasite. One symptom of the condition is that an affected animal's urine turns red.
Explain the reason for the red colour of the urine.

(48 marks)

6. (a) Describe **four** signs of ripeness in a cereal.
- (b) Compare the growing of malting barley and feeding barley under the following headings:
(i) Soil type
(ii) Rotation
(iii) Fertilizer regime
(iv) End use.
- (c) Draw a labelled diagram to show the main structures of a cereal grain in longitudinal section.

(48 marks)

7. (a) Explain **each** of the following terms:
- (i) Interphase
 - (ii) Haploid
 - (iii) Inbreeding.
- (b) A maize plant, heterozygous for the recessive alleles hairless tassel (h) and short anther (l), is self-fertilised and the seeds are collected. The genes for tassel type and anther length are not linked. Use a cross to illustrate what proportion of the offspring you would expect to show
- (i) hairy tassel
 - (ii) short anther
 - (iii) hairy tassel **and** short anther.
- (c) Roan coat colour in Shorthorn cattle occurs as a result of incomplete dominance. Use a cross to show how roan coat colour arises from homozygous parents.

(48 marks)

8. Answer any **two** parts of (a), (b), (c).

- (a) Describe the husbandry practices involved in preparing a sow at the end of gestation for transfer from the dry-sow house to the farrowing house.
- (b) (i) Explain the meaning of the term *B.O.D.*
(ii) Name **one** agricultural pollutant with a high B.O.D.
(iii) Explain how the named pollutant affects water quality.
(iv) Suggest **two** key elements of a waste management strategy for the named pollutant.
- (c) Highlight the main differences between the members of any **three** of the following pairs:
- (i) Essential and non-essential amino acids
 - (ii) Annual and biennial plants
 - (iii) Drainage and irrigation
 - (iv) Eelworms and wireworms.

(48 marks)

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

- (a) The action of yeast in brewing **and** baking.
- (b) Progeny testing of A.I. bulls.
- (c) The use of systemic chemicals to control aphids.
- (d) Trace element deficiencies in crop production.
- (e) The fact that the creep area for bonhams is kept at a higher temperature than the rest of the farrowing house.

(48 marks)

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