

Agricultural Science - Ordinary Level

Wednesday, 18 June - Afternoon 2.00 to 4.30

Six questions to be answered.

1. Answer any six of the following:

- (a) Mention a chemical you would use to test a rock for the presence of calcium carbonate.
- (b) Name three fodder root crops.
- (c) Mention two chemical elements present in Glucose.
- (d) State the location in the animal body, of each of the following: Duodenum, Iris, Ileum.
- (e) Name two pigments found in a grass plant.
- (f) Mention briefly how you would measure the acidity of milk.
- (g) Explain the importance of capillarity in a soil.
- (h) Explain briefly why agar is used as a suitable medium for growing bacteria and fungi.
- (i) Name two vegetative characteristics you would consider in identifying a plant species.
- (j) Mention two differences between monocotyledon and dicotyledon seeds.

(60 marks)

- 2.
- (a) Compare the characteristics of any two contrasting named soil types under each of the following headings: composition; density; drainage; aeration.
 - (b) Comment on how soil temperature influences germination in the establishment of a named crop.
 - (c) Outline how the element nitrogen is re-cycled in nature.

(48 marks)

3. (a) Explain the importance of routine dosing of farm animals.
- (b) List two characteristics of a named Legume plant and explain why these plants are important in a grassland sward.
- (c) Give reasons why a calf or lamb is unable to digest forage foods in the first few weeks after birth. (48 marks)

OR

3. (a) Explain how adverse weather may affect the growth rate and condition of farm animals.
- (b) Explain the importance of vaccination in a livestock enterprise.
- (c) Describe an animal housing system with which you are familiar and outline the advantages of using such a system. (48 marks)

4. (a) State the main advantage of adopting a 'Leader-Follower' system in a mixed dairy/beef enterprise.
- (b) Describe the advantages of conserving grass as silage rather than hay.
- (c) In silage making, give reasons why grassland is usually cut at the six week stage of development after closing off. (48 marks)

5. (a) Distinguish, with the aid of labelled diagrams, the difference between the body structure of a Liver Fluke and that of an Earthworm.
- (b) Describe the life cycle of a named animal parasite and explain how a knowledge of the life cycle is important in its control.
- (c) Mention the advantages of using artificial insemination in a beef cattle enterprise. (48 marks)

6. (a) Describe a laboratory or field investigation you carried out to determine the population of a named plant or animal species.
- (b) Explain, giving examples, why micro-organisms may be considered to be useful or harmful on the farm.
- (c) Describe a successful farm animal enterprise, with which you are familiar, under each of the following headings:
- (i) Provision of replacement stock
 - (ii) Housing during winter
 - (iii) Supplementary feeding
 - (iv) Live weight gain. (48 marks)

7. (a) Explain what is meant by pure breeding plant species.
- (b) Write down the genotype of seeds, collected from a pea plant, which are grouped into each of the following categories: Homozygous round: Heterozygous round: Homozygous wrinkled.
- (c) Describe, with the aid of a diagram, any one of the following crosses that are used frequently in genetics: Back-crossing; A Dihybrid cross.
- (d) In the case of each of the following mention two traits which are used in conducting studies in genetics. Mice: *Drosophila melanogaster* (Fruit fly) : Tomato.
- (48 marks)**

8. Answer any two of the following:-

- (a) List, giving reasons, the grass species you would include in a seed mixture for the establishment of the following:
- (i) Short term grass sward
 - (ii) Permanent pasture.
- (b) Describe the principal cultivation practices for a named tillage crop under each of the following headings:
- (i) Pre-seeding stage
 - (ii) Post-seeding stage
- Mention the seeding rate for the crop and the expected yield per hectare.
- (c) Explain why photosynthesis is necessary for development of plants.

(48 marks)

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

- (a) The dental composition in the mouth of an adult ruminant animal.
- (b) A variation in the stem lengths of the same plant species growing on opposite sides of a hedgerow.
- (c) A change in the colour of blue litmus on being poured into the dissected stomach of an animal.
- (d) Use of a 'Strip-cup' prior to milking,
- (e) The colonisation of a pasture with Ragwort.

(48 marks)