

HURLSTONE AGRICULTURAL HIGH SCHOOL



Trial Higher School Certificate Examination 2009

AGRICULTURE

Paper 1

General Instructions:

- * Reading time - 5 minutes
- * **Working time - 2 hours**
- * Write using a black or blue pen
- * Draw diagrams using pencil
- * Board approved calculators may be used
- * Write your student number at the top of each page

Total marks - 70 marks

SECTION I

25 marks

Pages 2 - 5

Questions 1 - 3

Allow about **40 minutes** for this section.

SECTION II

30 marks

Pages 6 - 9

Questions 4 - 5

Allow about **50 minutes** for this section.

SECTION III

15 marks

Page 10

Attempt **ONE** question only from questions 6 - 9

Allow about **30 minutes** for this section

SECTION I.

25 marks

Attempt questions 1 - 3

Allow about 40 minutes for this section.

Answer the questions in the spaces provided.

Question 1. (10 marks)

Name ONE farm product you have studied.

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|------------------------|
| Name of product: |
|------------------------|

For the farm product you have named -

(a) Name ONE measure used to assess product quality. (½ mark)

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Outline ONE practice the farmer can use to improve this quality measure. (1 mark)

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(b) Name ONE measure to assess the quantity of product produced. (½ mark)

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Outline ONE practice the farmer can use to improve the quantity of product produced. (1 mark)

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(c) Explain how the timing of a named "on farm" management operation improves the productivity of the farm. (3 marks)

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(d) Identify the strategies used to improve market share in one described advertising and promotion campaign, for your chosen product. (4 marks)

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Question 2. (9 marks)

(a) "Aboriginal land management, before European settlement, was sustainable." Using one example, justify this statement. (3 marks)

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(b) Describe the practices used by farmers to more efficiently use water resources and so conserve water. and the government practices used to encourage these changes. (6 marks)

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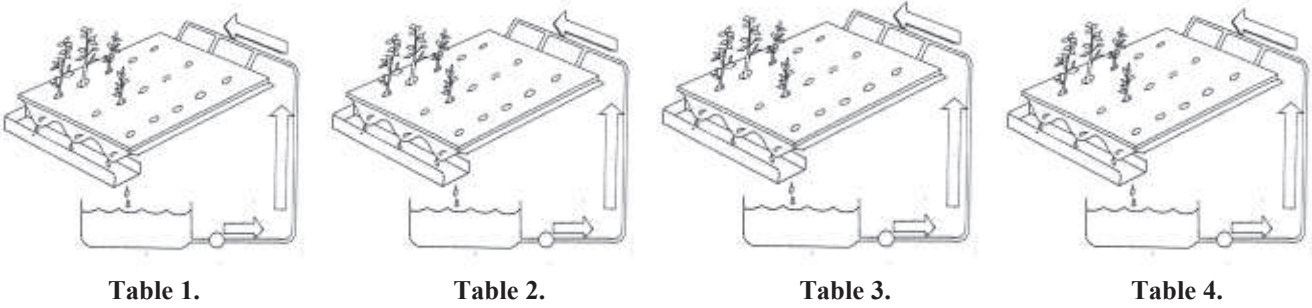
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Question 3. (6 marks)

Four hydroponic tables were set up, each with 15 lettuce seedlings. Tables 1 and 4 were supplied with nutrient solution A and nutrient solution B was used with tables 2 and 3.

The Year 12 agriculture class's aim was to determine which nutrient solution is best when producing a lettuce crop.



(a) State one measurement that the students should take.

(1 mark)

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(b) Outline ONE method that the students could use to analyse the results obtained in this experiment.

(1 mark)

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(b) Describe good experimental design features that would be applied to this trial.

(4 marks)

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SECTION II

30 marks

Attempt questions 4 - 5

Allow about 50 minutes for this section.

Answer the questions in the spaces provided.

Question 4. (15 marks)

(a) Outline the expression $P = G + E$ as it relates to plants.

(3 marks)

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(b) A ten year wheat trial with different treatments produced the following results -

| Wheat grown continuously | Wheat grown in rotation with legume/grass pastures | Yield of wheat t/ha |
|---|--|---------------------|
| with compost applied at 35t/ha/yr | | 5.8 |
| with NPK fertilizer applied at 48kg/ha/yr | | 2.1 |
| | with compost applied at 35t/ha/yr | 6.8 |
| | with NPK fertilizer applied at 48kg/ha/yr | 3.2 |

Account for the differences in wheat crop yields.

(6 marks)

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(c) Farmers often need to use herbicides to control weeds, insecticides to control insect pests and fungicides that protect crops.
Describe the potential adverse consequences of excessive pesticide use. (6 marks)

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Question 5. (15 marks)

- (a) The weaning weights of calves produced from three cattle breeding systems were compared. The calves were weaned off their mothers at 6 months of age.

Table 1: Average calf weaning weights gained from various breeding systems.

| Breeding system | Average weaning weight of calves (kg) |
|------------------------|---------------------------------------|
| Breed A X Breed A | 150 |
| Breed A X Breed B | 170 |
| Crossbred AB X Breed C | 210 |

Identify the purpose of crossbreeding in animal production. (2 marks)

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- (b) (i) Identify ONE source of non-protein nitrogen that can be used by ruminant farm animals. (1 mark)

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(ii) Describe a possible benefit of feeding non-protein nitrogen to ruminant farm animals. (2 marks)

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- (c) Outline the roles of micro-organisms in the digestive system of ruminants. (2 marks)

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(d) Explain how oestrogen influences both cow reproduction and behaviour. (2 marks)

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(e) Outline ONE legal requirement of an operation carried out on a named farm animal. (2 marks)

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(f) Two pens of steers in a feedlot were fed the same quantity of an identical ration for ninety days. The resulting average growth rates for each pen are shown.

| Pen | Number of steers | Age (months) | Average growth rate (kg/day) |
|-----|------------------|--------------|------------------------------|
| A | 10 | 14 | 2.0 |
| B | 10 | 14 | 1.6 |

Outline possible reasons for the variation in average growth rate between the two pens of steers. (4 marks)

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SECTION III

15 marks

Attempt ONE question from questions 6 - 9

Allow about 30 minutes for this section.

Answer your chosen question in a writing booklet.

Ensure your student number is placed on each writing booklet you use.

Extra writing booklets are available.

Question 6. (15 marks)

- (a) Describe the different forms of plant interference. (5 marks)
- (b) Compare the genetic basis of the variety of plant breeding methods used by plant scientists to develop new and improved plant varieties for use on farms. (10 marks)

Question 7. (15 marks)

- (a) For a named land degradation problem, outline the farming practices that produce the problem. (5 marks)
- (b) For a named nutrient, evaluate the practices that the farmer can use to improve its cycling through the farm's soil - plant environment. (10 marks).

Question 8. (15 marks)

- (a) Describe TWO factors that limit the fertility of farm animals and for each outline a practice that farmers use to reduce the limitation. (5 marks)
- (b) Evaluate THREE components of an Integrated Pest Management (IPM) program for an animal production system you have studied. (10 marks)

Question 9. (15 marks)

- (a) Describe how a named production report that is available to the farmer, whose product you studied in your farm product study, can be used to improve farm practices. (5 marks)
- (b) Compare the positives and negatives of the financial pressures that impact on farmers and their farms. (10 marks)

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AGRICULTURE

Paper 2

General Instructions:

- * Paper 2 should be attempted only by students who have studied the electives
- * Reading time - 5 minutes
- * **Working time - 1 hour**
- * Write using a black or blue pen
- * Write your student number at the top of each answer booklet.
- * Use a separate answer booklet for each of your two electives
- * Extra answer booklets are available

Total marks - 30 marks

- * Attempt TWO questions from questions 2, 5 and 6
- * Allow about 30 minutes for each question.

Total marks - 30
Attempt TWO questions from Questions 2, 5 and 6
Allow about 30 minutes for each question.

Answer each question in a SEPARATE writing booklet. Ensure your student number is placed on each booklet you use. Extra writing booklets are available.

Question 2. - Animal Management (15 marks)

- (a) Describe how a knowledge of the functions of reproductive hormones assist with the reproductive management and breeding techniques in farm animals. (3 marks)
- (b) Explain, using examples, how objective measurement has been used to improve production in an animal production system. (4 marks)
- (c) Evaluate TWO management techniques that farmers can use to manipulate reproduction in farm animals. (8 marks)

Question 5. - Plant Management (15 marks)

- (a) Using two examples, relate root cellular structure to function. (3 marks)
- (b) Describe the processes that allow the plant to take in both nutrients and water. (4 marks)
- (c) Compare the response of both vegetative and reproductive yields to plant density. Include in your answer two examples of vegetative plant products and two examples of reproductive plant products. (8 marks)

Question 6. - Sustainable Land and Resource Management (15 marks)

- (a) For a named land degradation problem, describe its impact on plant or animal production. (3 marks)
- (b) Applying a land capability system, compare past land use with the present sustainable land use, for a farm that you have studied. (4 marks)
- (c) During your course you analysed a research study on an innovative technology or practice that conserves and uses water efficiently. Briefly outline the research work, identify its main findings and assess its value to farmers. (8 marks)