

HURLSTONE AGRICULTURAL HIGH SCHOOL



Trial Higher School Certificate Examination 2008

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.

Name of product:

For the farm product you have studied:

(a) State TWO product specifications that should be reached, to supply a quality product. (1 mark)

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(b) For one of your two product specification, outline how the farmer would manage production to attain the product specification. (2 marks)

Product specification:

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(c) Explain how product specification information may be used in an advertising campaign for the farm product. (3 marks)

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(d) Explain the timing of a named management operation on the farm producing your product and describe how this improves farm productivity. (4 marks)

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Question 2. (9 marks)

The table compares the effects of conventional cultivation of the soil and minimum tillage on soil properties.

<i>Type of soil preparation before sowing seeds</i>	<i>Soil properties</i>				
	Water runoff (% rain applied)	Water (rainfall) penetration depth (cm)	Soil loss from water erosion (kg/ha)	Organic matter content (% of soil)	Peds per cubic cm
<i>Conventional cultivation</i>	42	58	290	5.60	32
<i>Minimum tillage</i>	30	171	180	7.20	44

(a) Define the phrase "sustainable farming". (2 marks)

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(b) Relate your definition to the effects of minimum tillage on soils.

(3 marks)

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(c) Justify the use of crop rotation in Australian farming systems.

(4 marks)

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Question 3. (6 marks)

A group of agriculture students have been asked to set up a trial to compare ryegrass/white clover pasture growth and yield in response to three NPK fertilizer application rates - 0kg/ha, 100kg/ha and 200kg/ha. They have a 100m X 100m paddock to use that has been recently sown to ryegrass and white clover seed and presently has a newly established pasture growing.

Outline how this group of students would set up the trial. You can use a diagram to help.

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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) The table shows the results of a trial carried out to determine the effect of weed density of Thornapple and Wild radish on the yield of sorghum.

<i>Thornapple (plants/m²)</i>	<i>Sorghum yield (t/ha)</i>
0	4.0
1	3.8
3	3.0
9	1.5
20	0.9

<i>Wild radish (plants/m²)</i>	<i>Sorghum yield (t/ha)</i>
0	4.0
1	3.8
3	3.5
9	2.9
20	2.1

- (i) Identify the treatment that resulted in the lowest yield of sorghum. (1 mark)

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- (ii) Explain why sorghum yield decreases as the level of weeds increases. (2 marks)

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- (b) Explain why it is desirable to increase the level of organic matter in the soil of most cropping enterprises. (2 marks)

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(c) Describe using ONE named plant production system you have studied how the environment can be manipulated to enable the plant to approach its genetic potential. (4 marks)

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(d) Discuss the advantages and disadvantages of using native pasture species in a pasture production system and explain why they are considered sustainable. (6 marks)

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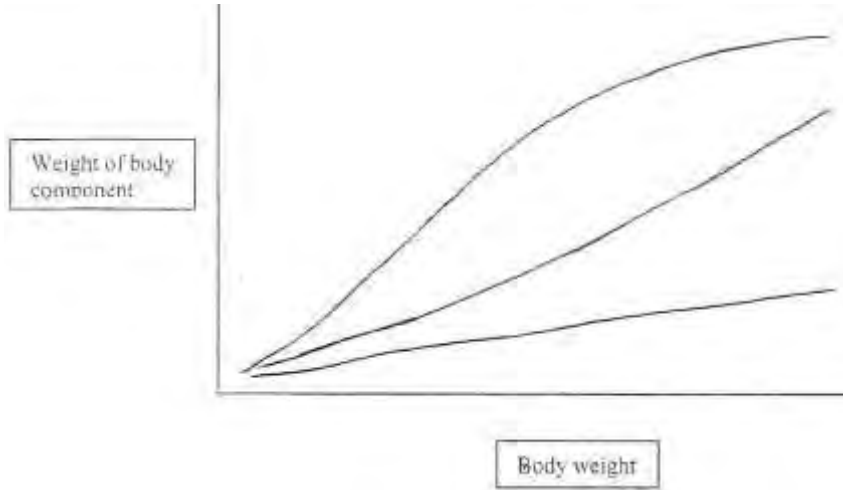
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Question 5. (15 marks)

- (a) (i) The figure shows the changes that occur in the major components of the animal's body as it increases in weight.
On each graphed line correctly label the component of the animal's body. (1½ marks)



- (ii) Describe how two named environmental factors affect the growth of farm animals. (3 marks)

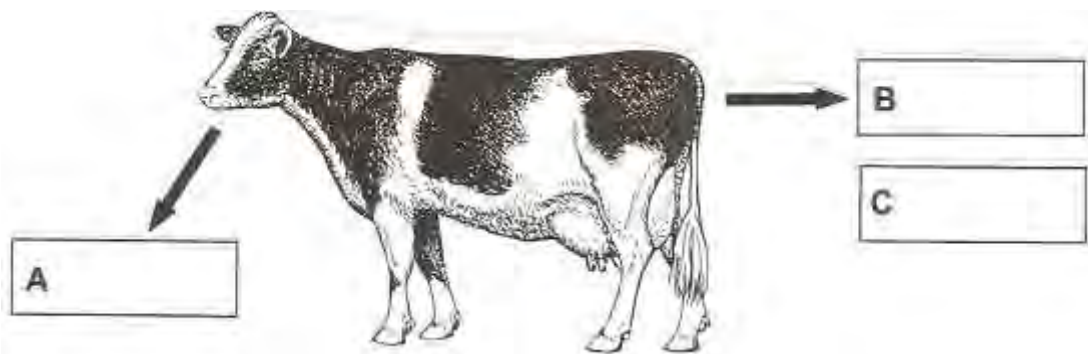
Environmental factor:

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Environmental factor:

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- (b) Often half the energy contained in a food is not available for an animal to use.
(i) On the diagram of the dairy cow, boxes A, B and C represent energy losses. Name them. (1½ marks)



(b) (ii) It is the metabolisable energy content of the feed that can be used by the animal.
How does the dairy cow use metabolisable energy? (2 marks)

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(c) Compare the roles of the hormones oestrogen and testosterone in the regulation of animal reproduction and behaviour. (3 marks)

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(d) Breeding systems used with animals include -

<i>Group 1.</i>	<i>Group 2.</i>
Inbreeding	Crossbreeding
Line-breeding	Out-breeding

Contrast the genetic benefits gained from one system from group 1. and one system from group 2. (4 marks)

Two breeding systems chosen:

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Section III
15 marks

Attempt ONE question from questions 6 - 9
Allow about 30 minutes for this section

Answer the 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 problems agricultural chemicals have on the environment and host organisms. (5 marks)
- (b) Evaluate an Integrated Pest Management program for a named plant production system and a targeted disease or insect pest that you have studied. (10 marks)

OR

Question 7. (15 marks)

- (a) Describe some of the unique methods that ruminant animals have that allows them to thrive on a comparatively "harsh" diet. (5 marks)
- (b) Assess the relative animal welfare merits of two contrasting systems of farming either pigs or poultry. The systems to assess are either - Intensive piggeries vs Free range OR Battery caged layer hens vs Free range layers. (10 marks)

OR

Question 8. (15 marks)

- (a) Describe the farming practices that have led to one named land degradation problem. You are to choose one of the following - salinity, acidification, soil structure decline and soil erosion. (5 marks)
- (b) Evaluate techniques that can be used to improve soil fertility. (10 marks)

OR

Question 9. (15 marks)

- (a) For a farm product that you have studied, describe the desired features that consumers demand at the market place. (5 marks)
- (b) Assess the roles of advertising and promotion for the farm product that you have studied. (10 marks)

End of paper

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Trial Higher School Certificate Examination 2008

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 1 - 6
- * Allow about 30 minutes for each question.

Total marks - 30
Attempt TWO questions from Questions 1 - 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 1. - Agribusiness (15 marks)

This elective is not offered at Hurlstone and hence there is no question for you to attempt.
Do not attempt this elective in the HSC.

Question 2. - Animal Management (15 marks)

- (a) Describe the nature of the immune system and how it prevents disease by vaccination. (3 marks)
- (b) Describe how Artificial Insemination is used to manipulate reproduction in farm animals. (4 marks)
- (c) State the aim of one study of a current technique/technology which is advancing productivity in animal production systems.
Outline the findings of this study.
Assess the role of the research in advancing productivity in the related animal production system. (8 marks)

Question 3. - Horticulture (15 marks)

This elective is not offered at Hurlstone and hence there is no question for you to attempt.
Do not attempt this elective in the HSC.

Question 4. - Innovation and Diversification (15 marks)

This elective is not offered at Hurlstone and hence there is no question for you to attempt.
Do not attempt this elective in the HSC.

Question 5. - Plant Management (15 marks)

- (a) Describe the process of reproduction in flowering plants or the processes of water and nutrient uptake by plants. (3 marks)
- (b) Roots, stems and leaves are the main organs of plants. Select ONE of these organs, and explain how its cellular anatomy relates to the function of the organ. (4 marks)
- (c) State the aim of one study of plant breeding or related research in advancing productivity in plant production.
Outline the findings of this study.
Assess the role of the research in advancing productivity in the related plant production system. (8 marks)

Question 6. - Sustainable Land and Resource Management (15 marks)
Is on the next page.

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

- (a) Describe the practices being adopted by farmers to improve and maintain the quality of available water resources. (3 marks)
- (b) State the aim of one study of an innovative technology or practice that is assisting with the conservation and efficient use of water in an agricultural production system. Describe the experimental methods used. (4 marks)
- (c) For a land degradation problem you have studied -
- describe the physical and biological processes occurring in the soil that would lead to the problem;
 - outline the effects of the land degradation problem on plant and animal production. (8 marks)