

B O A R D O F S T U D I E S
NEW SOUTH WALES

2009

**HIGHER SCHOOL CERTIFICATE
EXAMINATION**

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Centre Number

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Student Number

Agriculture

Paper 1

General Instructions

- Reading time – 5 minutes
- Working time – 2 hours
- Write using black or blue pen
- Draw diagrams using pencil
- Board-approved calculators may be used
- Write your Centre Number and Student Number at the top of this page and pages 5, 7, 9 and 11

Total marks – 70

Section I Pages 2–8

25 marks

- Attempt Questions 1–3
- Allow about 40 minutes for this section

Section II Pages 9–13

30 marks

- Attempt Questions 4–5
- Allow about 50 minutes for this section

Section III Page 15

15 marks

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

Section I

25 marks

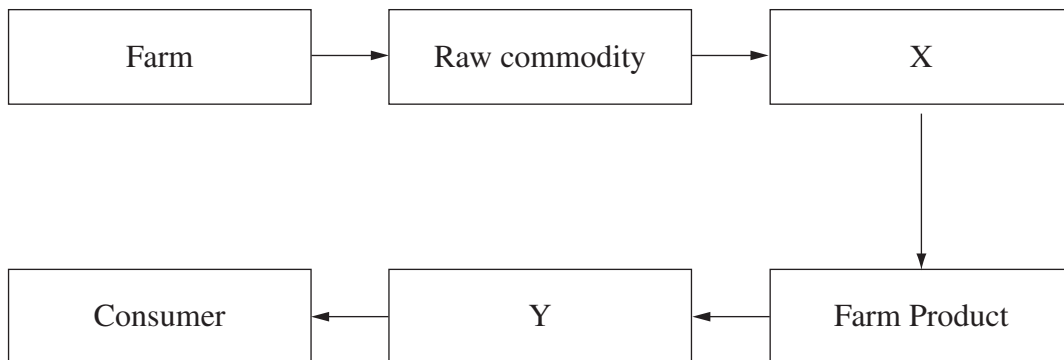
Attempt Questions 1–3

Allow about 40 minutes for this section

Answer the questions in the spaces provided.

Question 1 (8 marks)

The diagram shows a simple marketing chain for a farm product.



Name ONE farm product you have studied

For the farm product you have named:

(a) Outline a process that occurs at X.

2

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Question 1 continues on page 3

Question 1 (continued)

(b) Describe a marketing strategy that can be used at Y to increase consumer demand for the farm product. **3**

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(c) How does the supply of the raw commodity from the farm affect the price paid by consumers for the farm product? **3**

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End of Question 1

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Centre Number

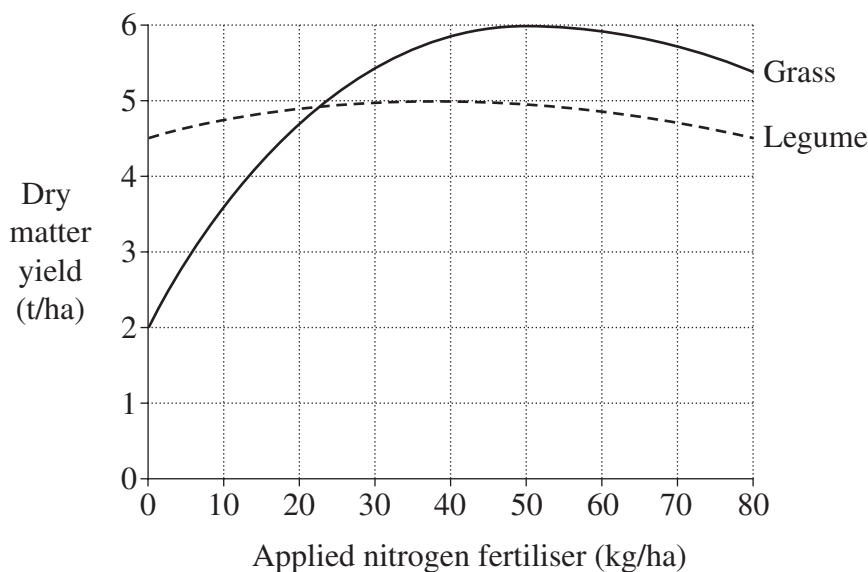
Section I (continued)

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Student Number

Question 2 (8 marks)

The graph shows the response of dry matter yield to applied nitrogen fertiliser for a grass/legume pasture trial.



(a) (i) What rate of applied nitrogen fertiliser gave the maximum dry matter yield for grasses? 1

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(ii) Explain why grasses and legumes responded differently to the application of nitrogen fertiliser. 3

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Question 2 continues on page 6

Question 2 (continued)

(b) Explain how the overuse of fertiliser affects the environment.

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End of Question 2

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Centre Number

Section I (continued)

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Student Number

Question 3 (9 marks)

An experiment was conducted to determine the effect of two fungicides, Dithane and Chlorothalanil, on a disease that affects the grain yield of chickpeas.

<i>Application rate</i> (litres/ha)	<i>Grain yield</i> (tonne/ha)	<i>Total cost*</i> (\$/ha)
<i>Dithane</i>		
0	0.5	0
0.5	2.1	17
1.0	3.4	29
<i>Chlorothalanil</i>		
0	0.5	0
0.5	3.3	20
1.0	3.5	35

*Total cost (\$/ha) = Fixed application cost + cost of fungicide

- (a) What is the application rate of fungicide for the control in this experiment? **1**

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- (b) Outline the role of the control in this experiment. **2**

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- (c) Calculate the cost of one litre of Chlorothalanil. Show all working. **2**

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Answer:.....

Question 3 continues on page 8

Question 3 (continued)

- (d) Explain the factors that a farmer should consider, in addition to the information provided from this experiment, before deciding to use a fungicide on chickpeas.

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End of Question 3

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Centre Number

Section II

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Student Number

30 marks

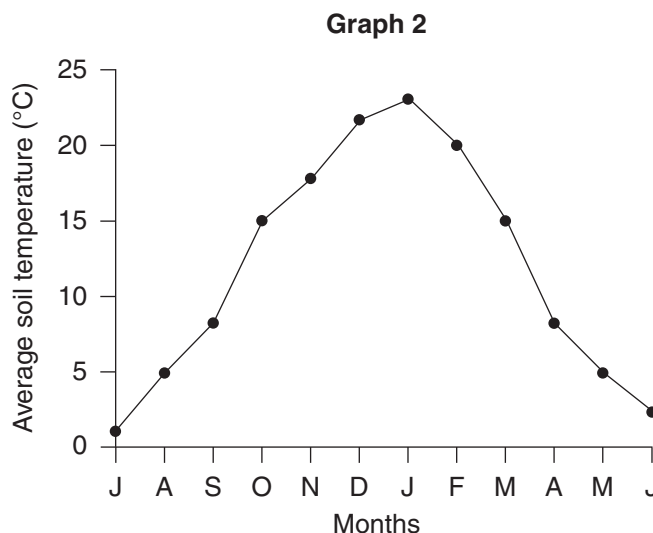
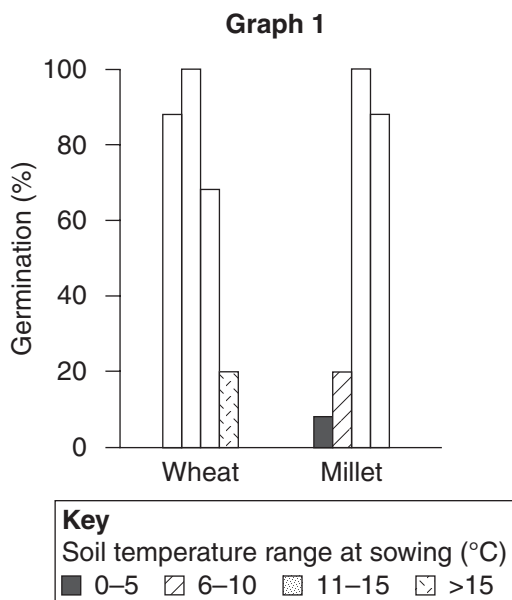
Attempt Questions 4–5

Allow about 50 minutes for this section

Answer the questions in the spaces provided.

Question 4 (15 marks)

Graph 1 shows the effect of four soil temperature ranges at sowing on the germination percentage of wheat and millet. Graph 2 shows the average soil temperatures for an area in Australia over one year.



(a) (i) In which months should wheat be sown to ensure a germination greater than 80%? 2

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(ii) Why is it better to sow millet in October rather than March in Australia? 3

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Question 4 continues on page 10

Question 4 (continued)

- (b) Outline the genetic basis of a method that plant breeders use to improve plant quality or production. **4**

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- (c) Discuss the use of introduced pasture species in Australian pasture production systems. **6**

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End of Question 4

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Centre Number

Section II (continued)

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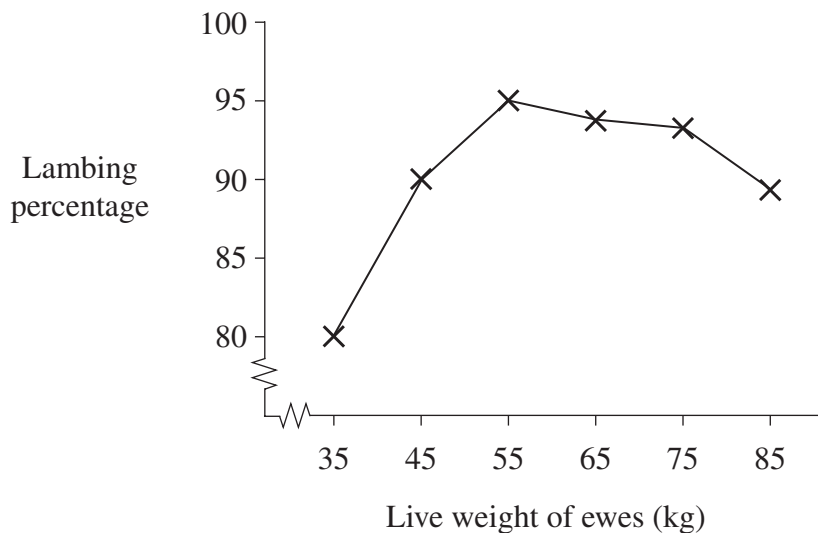
Student Number

Question 5 (15 marks)

A method that farmers may use to calculate lambing percentage is:

$$\text{lambing percentage} = \frac{\text{number of live lambs born}}{\text{total number of lambs born}} \times \frac{100}{1}$$

The graph shows the effect of the live weight of merino ewes (kg) at the time of lambing on the lambing percentage for a typical sheep property in the central west of NSW.



- (a) (i) Describe the effect of the live weight of ewes on lambing percentage as shown in the graph. **2**

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Question 5 continues on page 12

Question 5 (continued)

- (ii) Explain how information in the graph can assist farmers to manage ewes, in order to maximise lambing percentages. 3

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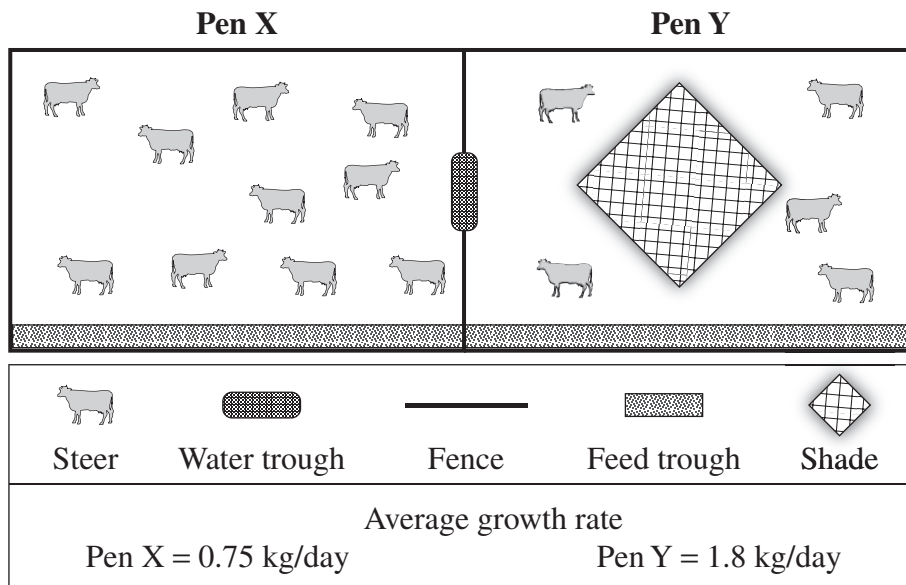
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- (b) The diagram shows two equal-sized pens of feedlot steers and gives the average growth rates obtained over 100 days. 4



Propose reasons to explain how the differences between Pen X and Pen Y lead to the variation in average growth rates.

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Question 5 continues on page 13

Question 5 (continued)

- (c) Explain the role of hormones in the regulation of animal reproduction and behaviour.

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End of Question 5

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Agriculture

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. Extra writing booklets are available.

Question 6 (15 marks)

- (a) Describe the effect of the changing nature of farm ownership on Australian agriculture. **5**
- (b) Discuss strategies available to farmers to manage the risk associated with the changing cost of farm inputs and irregular levels of income. **10**

OR

Question 7 (15 marks)

- (a) Explain the effect of Australian land use practices on soil salinity. **5**
- (b) Analyse factors that may influence a farmer's decision to optimise long-term sustainability over short-term profitability. **10**

OR

Question 8 (15 marks)

- (a) How does the process of photosynthesis contribute to the growth of plants? **5**
- (b) Evaluate techniques a farmer can use to manage plant interference to improve plant productivity. **10**

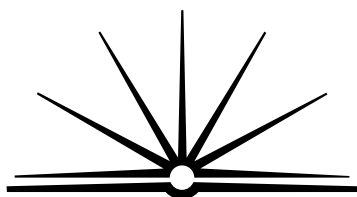
OR

Question 9 (15 marks)

- (a) Explain the nutritional requirements for an animal you have studied. **5**
- (b) Assess the impact of publicity about animal welfare issues on animal production systems. **10**

End of paper

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B O A R D O F S T U D I E S
NEW SOUTH WALES

2009

**HIGHER SCHOOL CERTIFICATE
EXAMINATION**

Agriculture

Paper 2

General Instructions

- Paper 2 should be attempted only by students who have studied Electives
- Reading time – 5 minutes
- Working time – 1 hour
- Write using black or blue pen
- Board-approved calculators may be used

Total marks – 30

- 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. Extra writing booklets are available.

Question 1 — Agribusiness (15 marks)

- (a) Describe the research method that was used in a study to determine the impact of a large rural business organisation on agricultural industries. **3**
- (b) Compare TWO farm advisory services that farmers may use to help manage their farms. **4**
- (c) Evaluate the impact of international markets on farm businesses. **8**

Question 2 — Animal Management (15 marks)

- (a) Account for the collection of various forms of data in a study of a current technique/technology that is advancing productivity in animal production systems. **3**
- (b) How does a vaccine interact with an animal's immune system to prevent disease? **4**
- (c) Evaluate an innovative breeding system or technique that has been introduced to manipulate animal reproductive efficiency. **8**

Question 3 — Horticulture (15 marks)

- (a) Describe the way results were presented in a study of a technological innovation aimed at improving productivity in a horticultural industry. **3**
- (b) How do the characteristics of plants affect their use in horticulture? **4**
- (c) Assess the influence of changing markets on production techniques or post-harvest handling of horticultural products. **8**

Question 4 — Innovation and Diversification (15 marks)

- (a) Describe the findings from a study of the development and implementation of an alternative agricultural production system or technology. **3**
- (b) Compare the effectiveness of techniques that can be used to market an agricultural innovation. **4**
- (c) Evaluate the importance of meeting legal and institutional requirements when introducing an alternative agricultural system, enterprise or technology. **8**

Question 5 — Plant Management (15 marks)

- (a) Describe the way data was analysed in a study of the role of plant breeding or related research to improve plant productivity. **3**
- (b) Explain the physiological process of nutrient uptake in plants. **4**
- (c) Evaluate the techniques that a farmer may use to manage soil moisture for plant production systems. **8**

Question 6 — Sustainable Land and Resource Management (15 marks)

- (a) Describe the way equipment was used in a study of a technology or practice related to the conservation and efficient use of water. **3**
- (b) Explain the importance of developing regulations for the use of water in Australian agricultural production systems. **4**
- (c) Evaluate a whole farm plan or catchment management program. Include examples of the strategies involved in this plan or program. **8**

End of paper

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