VICTORIAN CURRICULUM AND ASSESSMENT AUTHORITY

Victorian Certificate of Education 2007

SUPERVISOR TO ATTACH PROCESSING LABEL HERE

STUDENT NUMBER

									Letter
Figures									
Words									

AGRICULTURAL AND HORTICULTURAL STUDIES

Written examination

Wednesday 7 November 2007

Reading time: 9.00 am to 9.15 am (15 minutes)
Writing time: 9.15 am to 10.45 am (1 hour 30 minutes)

QUESTION AND ANSWER BOOK

Structure of book

Number of questions	*Number of questions to be answered*	*Number of marks*
7	7	100

- Students are permitted to bring into the examination room: pens, pencils, highlighters, erasers, sharpeners and rulers.
- Students are NOT permitted to bring into the examination room: blank sheets of paper and/or white out liquid/tape.
- No calculator is allowed in this examination.

Materials supplied
- Question and answer book of 24 pages.

Instructions
- Write your **student number** in the space provided above on this page.
- All written responses must be in English.

Students are NOT permitted to bring mobile phones and/or any other unauthorised electronic devices into the examination room.

Instructions

Answer **all** questions in the spaces provided.

In **Question 7**, choose **one** case study and answer the questions. There are four case studies to choose from.

Question 1

Animal and plant environments may be modified in many ways to improve production.

a. For each of the following state **two** ways to

i. increase the water-holding capacity of growing media or soil

1. _____

_____

2. _____

_____

ii. reduce the turbidity of water in a dam used for stock drinking water

1. _____

_____

2. _____

_____

iii. improve the drainage of a paddock by altering its topography

1. _____

_____

2. _____

_____

iv. reduce the light intensity in a glasshouse.

1. _____

_____

2. _____

_____

2 + 2 + 2 + 2 = 8 marks

b. Often there are a number of ways to modify a specific aspect of a plant's or animal's growing environment.

i. What are the advantages and disadvantages of deep ripping a paddock instead of adding organic matter and gypsum to increase soil aeration?

ii. What are the advantages and disadvantages of using a drip irrigation system instead of an overhead sprinkler system to water trees in an orchard?

iii. What are the advantages and disadvantages of using a perlite/vermiculite mix instead of a sand/peat moss mix for propagating cuttings?

3 + 3 + 3 = 9 marks

Total 17 marks

Question 2

Choose one pest or disease from the list provided in Table 1 (below). Show your choice by placing a **tick** in the box next to it.

Table 1. Selected pests or diseases

mosaic virus		lice	
downy mildew		red-legged earth mite	
grass tetany		aphids	
pulpy kidney		snails	
rust		liver fluke	

a. What specific business type does this pest or disease affect?

1 mark

b. What are the symptoms (signs) that show this pest or disease is present?

2 marks

c. Explain in detail an integrated pest or disease management strategy a manager could use to prevent **and** control this pest or disease.

5 marks

d. From the list of pests and diseases in Table 1, give an example of a

i. fungal disease _____

ii. metabolic disease _____

iii. bacterial disease _____

1 + 1 + 1 = 3 marks

Total 11 marks

Question 3

Choose one weed you are familiar with from Table 2 (below). Show your choice by placing a **tick** in the box next to it.

Table 2. Selected weeds

Paterson's curse *(Echium plantagineum)*		Wild oats *(Avena fatua)*	
Ragwort *(Senecio jacobaea)*		Liverwort *(Marchantia polymorpha)*	
Variegated thistle *(Silybum marianum)*		Winter grass *(Poa annua)*	
Silver grass *(Vulpia spp.)*		Gorse *(Ulex europaeus)*	
Chilean needlegrass *(Nassella neesiana)*		Wild radish *(Raphanus raphanistrum)*	

a. Explain how a manager would prevent **and** control this weed.

3 marks

b. Give three examples of how your chosen weed affects the sustainability of a business.

Example 1

Example 2

Example 3

3 marks

Total 6 marks

Question 4

Technology

In this question you will be answering questions about two new or emerging technologies associated with a specific agricultural or horticultural business.

Choose one agricultural or horticultural business with which you are familiar from Table 3 (below). Show your choice by placing a **tick** in the box next to it. (Choose one only.)

Table 3. Selected business types

cereal cropping		garden design/construction	
poultry for meat		ornamental garden maintenance	
poultry for eggs		glasshouse plants	
beef cattle		container-grown ornamentals	
pigs		field-grown vegetables, herbs or flowers	
sheep or goats		production of indigenous plants	
dairy cows		hydroponic production	
grapevines		production of fruit/nuts from trees	
fish or yabbies		horses for recreation	
turf production		rearing rabbits for pet or meat market	

a. Name two different new or emerging technologies that your chosen business is using, or could use.

Technology 1 _____

Technology 2 _____

2 marks

b. **i.** Explain how the new or emerging **technology 1** you have named in **part a.** works or is done.

_____

_____

_____

_____

_____

_____

ii. For this new or emerging **technology 1**, explain the advantages and disadvantages it has over previously used technologies with regard to the **economic** sustainability of the business.

2 + 3 = 5 marks

c. i. Explain how the new or emerging **technology 2** you have named in **part a.** works or is done.

ii. For this new or emerging **technology 2**, explain the advantages and disadvantages it has over previously used technologies with regard to the **social or environmental** impact of the business.

2 + 3 = 5 marks

Total 12 marks

Question 5

From Table 4 below, choose one agricultural or horticultural business that you are familiar with in terms of its **business management**. Show your choice by placing a **tick** in the box next to it.

Table 4. Selected business types

cereal cropping		garden design/construction	
poultry for meat		ornamental garden maintenance	
poultry for eggs		glasshouse plants	
beef cattle		container-grown ornamentals	
pigs		field-grown vegetables, herbs or flowers	
sheep or goats		production of indigenous plants	
dairy cows		hydroponic production	
grapevines		production of fruit/nuts from trees	
fish or yabbies		horses for recreation	
turf production		rearing rabbits for pet or meat market	

a. Managers need financial, marketing and production skills to operate a business.

i. List four different **production skills** needed to operate a business of the type you have chosen.

1. _____

2. _____

3. _____

4. _____

ii. Four broad types of risk that can influence the profitability of a business are listed below. In the space provided, describe an example of each type of risk that specifically affects your chosen business type.

Type of risk	**Example of a risk that specifically affects your chosen business type**
environmental	
marketing	
financial	
production	

4 + 4 = 8 marks

b. **i.** Describe a quality standard appropriate to your chosen business.

ii. Explain how the business manager would ensure that this standard is achieved.

2 + 3 = 5 marks

c. State two occupational health and safety risks associated with a business of this type.

Risk 1

Risk 2

2 marks

d. For **one** of the occupational health and safety risks identified in **part c.** explain in detail how a manager would make sure that it did not become a problem.

3 marks

e. State the main difference between a budget and a cash flow record.

1 mark

Total 19 marks

Question 6

Many managers try to adopt strategies to make their agricultural or horticultural land more closely resemble natural ecosystems.

a. Describe two different strategies a manager could adopt to make an agricultural or horticultural property more closely approximate a natural ecosystem.

Strategy 1 _____

Strategy 2 _____

4 marks

b. Explain in detail how one of the strategies in **part a.** may influence the sustainability of the business. Your answer should consider **two** of the three aspects of environmental, economic and/or social sustainability.

6 marks

Total 10 marks

TURN OVER

Question 7

On the following pages there are four case studies and their questions.

Read the case studies and **select one** to answer.

In Table 5 (below) place a **tick** in the box next to the case study you are going to answer.

Table 5. Case studies

1. Ornamental plant nursery (pages 13–15)	
2. Grazing property (pages 16–18)	
3. Intensive animal production (pages 19–21)	
4. Broad-acre cropping (pages 22–24)	

(Answer only **one** case study.)

EITHER

Case study 1 – Ornamental plant nursery

Yolanda grows a range of ornamental plants in a field. They are sold as advanced plants that are dug up in winter and sold in root control bags. An automated system of overhead sprinklers is used to water the 'growing on' area. The excess irrigation water runs into a dam on a neighbouring property. Algal blooms are becoming a common occurrence in the dam.

Yolanda is concerned about a low-lying section of the field where the advanced plants are growing. All the plants in this section look unhealthy. Their new foliage is stunted and wilted. Even though there has been good rain recently, it looks as though the plants need more water. There is a fine white crystalline substance on the soil surface in the low-lying section of the field.

a. Name and give evidence for two potential environmental degradation issues in this case study.

i. Issue 1

ii. Evidence

iii. Issue 2

iv. Evidence

1 + 2 + 1 + 2 = 6 marks

b. Describe, in detail, integrated management strategies that will solve the environmental degradation on Yolanda's property.

5 marks

c. Describe two indicators that could be used to measure the success of the strategies you described in **part b.**

Indicator 1 _____

Indicator 2 _____

4 marks

d. Describe the steps required to develop a whole property management plan on Yolanda's property.

6 marks

e. Government regulations control many aspects of agricultural and horticultural businesses.

i. State an issue in the case study that is controlled by a government regulation.

ii. What is the name of the regulation referred to in **part i.**?

iii. Explain how this regulation affects the management of properties like Yolanda's.

1 + 1 + 2 = 4 marks

Total 25 marks

End of Case study 1

OR

Case study 2 – Grazing property

Helga owns a 400-hectare property. She runs 800 head of cattle on this property. The property has two distinct areas. The top part of the property is steep with several gullies and has little tree or shrub cover apart from a weed called gorse, which is not controlled. This drains onto the lower, gently sloped section of the property. The soil on the lower slopes has a large percentage of clay.

Over the last few years the amount of bare soil at the base of the gullies has increased. During the winter months there is an increasing area on the lower slopes that is becoming wet and quite impassable for vehicles. Pasture growth in this area is poor. There is little internal fencing on the property. The property has been very heavily stocked for the last two years and little soil renovation has been done. Cattle have been allowed to graze all areas, including the gullies.

a. Name and give evidence for two potential environmental degradation issues in this case study.

i. Issue 1

ii. Evidence

iii. Issue 2

iv. Evidence

1 + 2 + 1 + 2 = 6 marks

b. Describe, in detail, integrated management strategies that will solve the environmental degradation on Helga's property.

5 marks

c. Describe two indicators that could be used to measure the success of the strategies you described in **part b.**

Indicator 1 _____

Indicator 2 _____

4 marks

d. Describe the steps required to develop a whole property management plan on Helga's property.

6 marks

e. Government regulations control many aspects of agricultural and horticultural businesses.

i. State an issue in the case study that is controlled by a government regulation.

ii. What is the name of the regulation referred to in **part i.**?

iii. Explain how this regulation affects the management of properties like Helga's.

1 + 1 + 2 = 4 marks

Total 25 marks

End of Case study 2

OR

Case study 3 – Intensive animal production

George has a small piggery with a number of large sheds located on a gentle slope. The pigs have access to pasture during the day, but are housed and supplementary fed at night.

The property has two large paddocks; one above the sheds that is used for hay production and one below that is grazed by the pigs. Effluent from the sheds is stored in a concrete tank and is used to spray irrigate both paddocks. The lower paddock is being grazed unevenly and bare patches are starting to appear.

The water supply for George's piggery, for both stock water and cleaning, is from a dam at the bottom of the slope. During periods of heavy rain the dam looks muddy and overflows into a local creek. Algal blooms are becoming a common occurrence in the dam and local creek.

a. Name and give evidence for two potential environmental degradation issues in this case study.

i. Issue 1

ii. Evidence

iii. Issue 2

iv. Evidence

1 + 2 + 1 + 2 = 6 marks

b. Describe, in detail, integrated management strategies that will solve the environmental degradation on George's property.

5 marks

c. Describe two indicators that could be used to measure the success of the strategies you described in **part b.**

Indicator 1 _____

Indicator 2 _____

4 marks

d. Describe the steps required to develop a whole property management plan on George's property.

6 marks

e. Government regulations control many aspects of agricultural and horticultural businesses.

i. State an issue in the case study that is controlled by a government regulation.

ii. What is the name of the regulation referred to in **part i.**?

iii. Explain how this regulation affects the management of properties like George's.

1 + 1 + 2 = 4 marks

Total 25 marks

End of Case study 3

OR

Case study 4 – Broad-acre cropping

Ted runs a large broad-acre cropping property. His wheat yields have shown a steady decline over the past few years and yields have remained low even though large amounts of fertiliser have been applied.

The property uses conventional methods of stubble burning and weed eradication by soil cultivation. Over the years the colour of the soil has become paler. Soil has started to build up along fence lines. The soil was recently found to have a pH of 4.0. Runoff from the property drains into a neighbouring wetland. This wetland is increasingly experiencing algal blooms.

a. Name and give evidence for two potential environmental degradation issues in this case study.

i. Issue 1

ii. Evidence

iii. Issue 2

iv. Evidence

1 + 2 + 1 + 2 = 6 marks

b. Describe, in detail, integrated management strategies that will solve the environmental degradation on Ted's property.

5 marks

c. Describe two indicators that could be used to measure the success of the strategies you described in **part b.**

Indicator 1 _____

Indicator 2 _____

4 marks

d. Describe the steps required to develop a whole property management plan on Ted's property.

6 marks

e. Government regulations control many aspects of agricultural and horticultural businesses.

i. State an issue in the case study that is controlled by a government regulation.

ii. What is the name of the regulation referred to in **part i.**?

iii. Explain how this regulation affects the management of properties like Ted's.

1 + 1 + 2 = 4 marks

Total 25 marks

END OF QUESTION AND ANSWER BOOK