VICTORIAN CURRICULUM AND ASSESSMENT AUTHORITY

Victorian Certificate of Education 2004

SUPERVISOR TO ATTACH PROCESSING LABEL HERE

STUDENT NUMBER

									Letter
Figures									
Words									

AGRICULTURAL AND HORTICULTURAL STUDIES

Written examination

Wednesday 3 November 2004

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*
6	6	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 22 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 electronic communication devices into the examination room.

Instructions

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

Note that in Question 6 students must only answer questions relating to either the Horticulture or Agriculture case study.

Question 1

From the list provided in Table 1, choose the pest or disease that you are most familiar with by placing a tick in the appropriate box.

Table 1. Selected pests or diseases

botflies		Johne's disease	
black spot		liver fluke	
cabbage moth		mastitis	
coccidiosis		powdery mildew	
crown gall		rusts	
damping off		ticks	

a. What specific type of agricultural or horticultural enterprise is **most** affected by the pest or disease you have chosen?

1 mark

b. For the pest or disease you have chosen, describe the main symptoms (signs) that would indicate this pest or disease is present.

3 marks

c. Select from Table 2 **one** suitable method of prevention or control for the pest or disease that you have chosen from Table 1 by placing a tick in the appropriate box.

Table 2. Methods used to prevent or control pests or diseases

biological techniques		induced sterility	
chemicals		management practices	
cultural practices		organic practices	
eradication		pheromones	
genetic techniques		quarantine	

Explain how an enterprise manager would use the selected method to prevent **or** control the pest or disease.

3 marks

d. Integrated Pest Management (IPM) involves using several strategies to control pests and diseases. List **three** main strategies of IPM.

3 marks

Total 10 marks

Question 2

a. A plant's growth may be improved by controlling the environment in which it is growing.

List **two** ways a manager can alter the **humidity** inside a glasshouse or polyhouse to improve plant growth and productivity.

2 marks

b. List **two** ways a manager can control the **temperature variation** inside a glasshouse or polyhouse to improve plant growth and productivity.

2 marks

c. List **two** ways a manager can control the **water holding capacity** of soil/growing media.

2 marks

d. Explain how pH affects the availability of nutrients to plants in soil/growing media.

3 marks

Total 9 marks

Question 3

Environmental degradation is monitored and controlled by land managers in a variety of ways.

a. List **two** specific aspects of vegetation cover that land managers should be monitoring.

2 marks

b. Besides salinity, name **two** types of environmental degradation that are likely to be a result of poor vegetation cover.

2 marks

c. Explain a sustainable management strategy that a land manager could use to prevent one of these types of degradation becoming a problem.

4 marks

d. List **three** strategies land managers should use to maintain **short-term** economic production from land affected by dryland salinity.

3 marks

e. List **three** strategies land managers should use to ensure **long-term** sustainability from land affected by dryland salinity.

3 marks

Total 14 marks

Question 4

Many activities are required to **commercially** produce crops, animals, plants or garden services.

From the list provided in Table 3, choose the business type that you are most familiar with by placing a tick in the appropriate box.

Table 3. Selected agricultural or horticultural business

growing a cereal crop		designing and implementing an ornamental garden	
managing poultry for meat		maintaining an ornamental garden	
managing poultry for fresh eggs		growing flowering plants in a glasshouse	
rearing cattle for the beef market		container growing of ornamental plants	
rearing pigs for the meat market		field growing a vegetable, herb or flower crop	
rearing sheep to produce wool/prime lambs		growing indigenous plants for revegetation use	
producing milk for the whole milk market		hydroponic plant production	
managing vines to produce a crop of grapes		managing trees to produce a crop of fruit	
fish breeding		yabby breeding	

a. Business plans include marketing, financial and production plans. List **three** different items of information that would be included in a **marketing plan** for your chosen commercial business.

3 marks

b. List **three** different items of information that would be needed to develop a **financial plan** for your chosen commercial business.

3 marks

c. On Table 4 (on pages 8 and 9), describe in point form, and in order, the **production activities** involved in your chosen **commercial** business. Your answer should be written in the column titled 'Production activities'.

15 marks

d. What machinery and equipment are required by your chosen **commercial** business to complete each production activity you have listed in Table 4? Your answer should be written in the column titled 'Machinery/equipment required' **next to** the production activity for which it is used.

5 marks

Table 4. Production activities and specific machinery and equipment required for your chosen commercial business

Production activities	Machinery/equipment required

Total 26 marks

TURN OVER

Question 5

On Table 5, choose an area of technology with which you are familiar by placing a tick in the appropriate box.

Table 5. Areas of technology and specific examples

Area of technology		**Specific examples**
biological pest or disease control		• the use of bacteria to control caterpillars • introduction of rust species to control specific weed species
genetic manipulation		• the transfer of genes for flower colour from one plant to another • the insertion of insecticide resistant genes into oil seed crops
alternative energy sources		• the use of gas produced from piggery waste • heat banks in solar glasshouses
reproduction manipulation		• inducing simultaneous ovulation in a herd of cattle • micropropagation of plants using tissue culture
innovation in resource management		• partial root zone drying of vines • cell grazing ewes and prime lambs
remote sensing		• the use of global positioning systems to help manage community parks and gardens • monitoring land degradation using global positioning systems and satellite photography
computer software		• grazing simulation models • environmental control systems
radiation usage		• irradiation of food to increase storage life • electronic beams to disinfect fruit
climate control and modification		• the use of heat blankets in glasshouses • double skinned polyhouses

a. For the area of technology you have chosen, select one of the specific examples given in Table 5, or a **similar recent** agricultural or horticultural technological advancement you are familiar with. Describe in detail what this technology does and the practices it has replaced.

4 marks

b. Before introducing this new technology a manager should ensure that it is environmentally, economically and socially sustainable. Discuss how a manager would judge the sustainability of the technology example you selected in **part a**.

6 marks

Total 10 marks

TURN OVER

Question 6

You must choose **either** the **Agriculture** or **Horticulture** case study. Answer **all** the questions that relate to the case study you have chosen.

Students must answer the questions for **one case study only**.

Place a tick in the box next to the case study you will answer (tick one only).

Agriculture ☐ – go to page 13

Horticulture ☐ – go to page 18

*If you have answered the questions for the **Horticulture** case study*
***do not** proceed with the following **Agriculture** case study.*

Agriculture case study

Graeme and Kaye Peters have just bought a 200-hectare dairy property (150 cows) in East Gippsland, Victoria.

The property has the following features.

- Annual rainfall is 1100–1200 mm.
- The topography is flat to undulating.
- The farm gets hot north or northeast winds during the summer and wet southwest winds during the winter and early spring.
- The main soil type is grey loam with heavy clay subsoil. The topsoil is quite shallow (10 cm).
- There are very few remnant trees present on the property.
- Cockchafer beetles eating the root system have affected several paddocks of clover/rye grass pasture.
- Ragwort, an unpleasant tasting noxious weed, is a problem. Adjoining properties to the east have heavy infestations of ragwort.
- Cows walk through several paddocks to reach the main laneway leading to the dairy.
- Farm paddocks average 15 hectares in size. Many contain several soil types.
- The dams on the property are unfenced to enable easy access for the cows.

a. Over the last couple of years the incidence of ragwort has increased markedly on the property.

i. Describe **two** ways in which ragwort would be a problem on the Peters' property.

ii. Using the information provided about the dairy farm on page 13, explain **two** different strategies that the Peters could use to reduce their weed problem.

4 + 6 = 10 marks

b. The Peters have been advised that the creation of windbreaks, using indigenous plants, will improve pasture and milk production.

i. Explain how these windbreaks may increase **pasture growth**.

ii. Explain how these windbreaks may increase **milk production**.

3 + 3 = 6 marks

c. The Peters have been advised that the present arrangement of paddocks, dams and laneways is not **environmentally sustainable**.

i. Explain how they can improve the environmental sustainability of the farm by changing the **size and arrangement of paddocks**.

ii. Explain how they can improve the environmental sustainability of the farm by changing the **dams**.

iii. Explain how they can improve the environmental sustainability of the farm by changing the **laneways**.

3 + 3 + 3 = 9 marks

d. List **two** organisations that the Peters should consult before changing their farm layout. Explain how each organisation would be able to help the Peters.

Organisation 1 _____

How this organisation could help

_____

_____

_____

_____

_____

_____

Organisation 2 _____

How this organisation could help

_____

_____

_____

_____

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_____

3 + 3 = 6 marks

Total 31 marks

OR

*If you have answered the questions for the **Agriculture** case study*
***do not** proceed with the following **Horticulture** case study.*

Horticulture case study

Giuseppe and Ima run Americano, a 2.5-hectare commercial wholesale nursery located southeast of Melbourne. They specialise in container production of perennial plants.

The nursery has the following features.

- It uses a commercially blended potting mix.
- The topography of the property is gently undulating.
- The property has weed infested unused industrial land on its north and west boundaries.
- Most of the original vegetation has been removed.
- The property has a northwest aspect and is exposed to hot northerly winds in summer.
- 1.5 hectares of the property is used as a 'growing-on' area with automatic overhead sprinklers. Water is piped from the city's mains supply.
- The growing-on area has a gravel surface to stop mud becoming a problem.
- Surface runoff is collected in surface drains and channelled into the city's storm water drainage system.
- Control of aphids and other insect pests is a problem in the growing-on area.

a. Over the last couple of years the incidence of weeds has increased markedly in the growing-on area.

i. Describe **two** ways in which weeds would be a problem in the growing-on area.

ii. Using the information provided about Americano on page 18, explain **two** different strategies that Giuseppe and Ima could use to reduce the weed problem.

4 + 6 = 10 marks

b. Giuseppe and Ima have been advised that the creation of windbreaks around the growing-on area, using indigenous plants, will affect plant production.

i. Explain how these windbreaks may **improve** production efficiency.

ii. Explain how these windbreaks may **reduce** production efficiency.

3 + 3 = 6 marks

c. Giuseppe and Ima have been advised that the present water management system in the growing-on area is not environmentally sustainable.

i. Explain how they can improve the environmental sustainability of the nursery by changing **the irrigation system**.

ii. Explain how they can improve the environmental sustainability of the nursery by changing **the drainage system**.

iii. Explain how they can improve the environmental sustainability of the nursery by changing **wastewater treatment and recycling practices**.

3 + 3 + 3 = 9 marks

d. List **two** organisations that Giuseppe and Ima should consult before changing their irrigation, drainage and wastewater treatment systems. Explain how each organisation would be able to help Giuseppe and Ima.

Organisation 1 _____

How this organisation could help

_____

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_____

_____

_____

Organisation 2 _____

How this organisation could help

_____

_____

_____

_____

_____

_____

3 + 3 = 6 marks

Total 31 marks

END OF QUESTION AND ANSWER BOOK