



**Victorian Certificate of Education
2012**

SUPERVISOR TO ATTACH PROCESSING LABEL HERE

STUDENT NUMBER

Letter

Figures										
Words										

**AGRICULTURAL AND HORTICULTURAL
STUDIES**

Written examination

Monday 12 November 2012

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

<i>Number of questions</i>	<i>Number of questions to be answered</i>	<i>Number of marks</i>
7	7	100

- Students are to write in blue or black pen.
- 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 16 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. Write using black or blue pen.

Question 1

- a.** Animal and plant environments can be modified in many ways to improve production.

For each of the following, state two ways to

- i.** maximise the birthing percentages of livestock

1. _____

2. _____

- ii.** maximise the germination of seeds

1. _____

2. _____

- iii.** minimise the turbidity of water in a dam that is used for stock drinking water.

1. _____

2. _____

2 + 2 + 2 = 6 marks

- b.** The moisture content of potting mix or soil influences how well a plant grows. Apart from adding water to change the moisture content, list three modifications to potting mix or soil that may be implemented to get the best growing conditions for plants.

1. _____

2. _____

3. _____

3 marks

NO WRITING ALLOWED IN THIS AREA

- c.** List three things that a manager can do to ensure that hothouse grown plants have the optimum environment for production.

1. _____

2. _____

3. _____

3 marks

- d.** List three things that a manager can do to ensure that intensively managed animals (such as those in feed lots, cages or pens) have the optimum environment for production.

1. _____

2. _____

3. _____

3 marks

NO WRITING ALLOWED IN THIS AREA

TURN OVER

Question 2

In Victoria there are several weeds of concern to agriculture, horticulture and the environment. Examples of these are given in Table 1.

Table 1. Examples of weeds of concern in Victoria

Common name	Scientific name
annual ryegrass/Wimmera rye	<i>Lolium rigidum</i>
blackberry	<i>Rubus fruticosus</i> aggregate
gorse/furse	<i>Ulex europaeus</i>
ragwort	<i>Senecio jacobaea</i>
serrated tussock	<i>Nassella trichotoma</i>
St John's wort	<i>Hypericum perforatum</i> L. Family Clusiaceae

a. Weed seeds are spread in a variety of ways.

i. In Table 1 there are two weeds for which wind is a major way in which the seeds are spread. Name these two weeds.

1. _____

2. _____

ii. List three distinctly different ways, **other than wind**, in which weed seeds are spread.

1. _____

2. _____

3. _____

2 + 3 = 5 marks

NO WRITING ALLOWED IN THIS AREA

NO WRITING ALLOWED IN THIS AREA

- b. Choose a weed from Table 1.

name of your chosen weed _____

You are going to be absent from your property for a year and you need to tell the manager how to deal with this weed. The manager has limited experience in this region, so it is important to give as much information as possible. You should include measures to avoid infestation and spread of the weed, and time-specific calendar details.

5 marks

Question 3**Table 2. Examples of pests and diseases of concern in Victoria**

Common name	Scientific name	Animal or plant it affects (host)
aphids	assorted species	3
footrot	<i>Dichelobacter nodosus</i>	sheep goats horses cattle
grass tetany	2	sheep goats cattle
intestinal worms (ruminants)	assorted species	cattle sheep goats
cattle lice	<i>Linognathus vituli</i>	cattle
sheep lice	<i>Bovicola bovis</i>	sheep
equine lice	<i>Haematopinus asini</i>	horses
chicken body lice	<i>Menacanthus stramineus</i>	fowl
1	<i>Avian paramyxovirus</i>	poultry
mastitis	N/A	cattle sheep goats
stem and bulb nematodes	<i>Ditylenchus dipsaci</i>	4

- a. Place the appropriate common name, scientific name or host next to the numbers 1–4 in Table 2 above.

4 marks

- b. Choose one pest or disease from Table 2.

name of your chosen pest or disease _____

Use the following questions to describe a management strategy to prevent and/or control your chosen pest or disease.

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

Question 3 – continued

NO WRITING ALLOWED IN THIS AREA

ii. How would you monitor the stage of development or extent of this pest or disease?

iii. Explain how the **source** of this pest or disease is controlled. Include in your answer how the host's environment can be managed so that it does not favour the pest or disease species.

iv. Suggest **at least two** methods of control that may be used to treat this pest or disease.

v. Explain the appropriate timing (critical timing) of the methods of control to effectively manage this pest or disease.

1 + 1 + 2 + 2 + 2 = 8 marks

NO WRITING ALLOWED IN THIS AREA

TURN OVER

Question 4

From Table 3 select **two** technological areas for which you know an example of new or emerging technologies. Show your selection by writing the number 1 and the number 2 next to your chosen technological areas.

Table 3. Technological areas

	biotechnology		biological control
	reproduction manipulation		genetic manipulation
	plant or animal breeding		alternative energy sources
	chemical pest or disease control		resource management methods
	information and communications innovation		Global Positioning System (GPS) technology
	precision agriculture/horticulture		radiation usage
	alternative materials		environment or system modelling

a. Technological area number 1

- i.** Name an innovation applicable to this technological area and describe how it works.

innovation _____

description _____

- ii.** For this technology, explain the advantages and disadvantages it has over previously used technologies with regard to the sustainability of a business.

2 + 4 = 6 marks

NO WRITING ALLOWED IN THIS AREA

NO WRITING ALLOWED IN THIS AREA

b. Technological area number 2

i. Name an innovation applicable to this technological area and describe how it works or how it is done.

innovation _____

description _____

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

2 + 4 = 6 marks

TURN OVER

Question 5

Case studies

Issues of environmental degradation need to be considered in the management of agricultural and horticultural enterprises. Choose **one** of the following two case studies, **either** Case study A **or** Case study B, and answer the questions for that case study only.

Tick (✓) your chosen case study.

Case study A page 10

or

Case study B page 12

EITHER

Case study A – Ornamental plant nursery

Jordan 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 area. The excess irrigation water runs into a dam on a neighbouring property. Algal blooms are becoming a common occurrence in the dam.

Jordan 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 of two potential environmental degradation problems **in this case study**.

problem 1 _____

evidence _____

problem 2 _____

evidence _____

6 marks

NO WRITING ALLOWED IN THIS AREA

NO WRITING ALLOWED IN THIS AREA

b. Describe, in detail, management strategies to fix these environmental degradation problems on Jordan’s property.
strategies for fixing problem 1

strategies for fixing problem 2

8 marks

c. Describe indicators for these environmental degradation problems that could be used to measure the success of the strategies you described in **part b**.

indicator for problem 1 _____

indicator for problem 2 _____

2 marks

d. One of Jordan’s management practices is illegal.
Briefly describe the practice that is illegal.

2 marks

- e. In 1994, the Victorian Parliament passed an Act relevant to agricultural and horticultural business owners' responsibilities.

Give the full name of this Act and give two reasons why it is important.

name of Act _____

reason 1 _____

reason 2 _____

3 marks

OR

Case study B – Dairy

Susan and John own a small dairy, with their yards, sheds and effluent pond on the side of a hill. They also own flat land along an adjoining creek where they irrigate lucerne for feed supplements for their farm and surrounding farmers' cattle.

The paddocks above the dairy are used for grazing the dairy cattle while they are being supplementary fed between milkings.

When it rains heavily, both run-off from the top paddocks and overflow from the effluent pond go down the hill, onto the lower paddocks and into the creek.

Algal blooms are becoming a common occurrence in the creek and, in warm weather, there is often a fine, white, crystalline substance on the tracks around the irrigated flats.

- a. Name and give evidence of two potential environmental degradation problems **in this case study**.

problem 1 _____

evidence _____

problem 2 _____

evidence _____

6 marks

NO WRITING ALLOWED IN THIS AREA

NO WRITING ALLOWED IN THIS AREA

b. Describe, in detail, management strategies to fix these environmental degradation problems on the property.
strategies for fixing problem 1

strategies for fixing problem 2

8 marks

c. Describe indicators for these environmental degradation problems that could be used to measure the success of the strategies you described in **part b**.

indicator for problem 1 _____

indicator for problem 2 _____

2 marks

d. One of Susan and John's management practices is illegal.
Briefly describe the practice that is illegal.

2 marks

- e. In 1994, the Victorian Parliament passed an Act relevant to agricultural and horticultural business owners' responsibilities. Give the full name of this Act and give two reasons why it is important.

name of Act _____

reason 1 _____

reason 2 _____

3 marks

Question 6

Agricultural and horticultural businesses contribute to climate change through their greenhouse gas emissions.

- a. Name three greenhouse gases and name a process by which agriculture or horticulture contribute to net emissions of each gas.

greenhouse gas 1 _____

contributing process for greenhouse gas 1

greenhouse gas 2 _____

contributing process for greenhouse gas 2

greenhouse gas 3 _____

contributing process for greenhouse gas 3

6 marks

- b. What management strategy could be introduced to an agricultural or horticultural business to reduce its net emission of one greenhouse gas without compromising profitability?

2 marks

NO WRITING ALLOWED IN THIS AREA

Question 7

Choose one agricultural or horticultural business that you are familiar with in terms of its business operation.

name of your selected business type _____

a. Consider what the business does.

i. Who is the main purchaser of the product(s) or service(s) from the business?

ii. What are the main inputs to this enterprise?

iii. What are the main processes of this enterprise? Provide **at least two** processes.

iv. What are the main outputs of this enterprise?

1 + 1 + 2 + 1 = 5 marks

b. What documentation would need to be produced to convince a lender to provide finance for the business?

3 marks

c. Design a strategy that would help to maintain the quality of the business's product(s) or service(s) in order to meet market expectations with regard to quality.

3 marks

Question 7 – continued
TURN OVER

NO WRITING ALLOWED IN THIS AREA

d. Explain the methods used to analyse the financial performance of the business.

3 marks

e. Explain how the ecological impact of the business could be calculated.

3 marks

f. Climate change may impact on your business and require changes to its operations to ensure sustainable profitability. Complete an analysis on introducing one innovation to address the **impact** of climate change on your chosen business type. In your response, analyse the strengths, weaknesses, opportunities and threats presented by introducing the innovation.

i. name of innovation _____

ii. strengths _____

weaknesses _____

opportunities _____

threats _____

1 + 4 = 5 marks

NO WRITING ALLOWED IN THIS AREA