

SUPERVISOR TO ATTACH PROCESSING LABEL HERE

	STUDENT NUMBER						Letter		
Figures									
Words									

# AGRICULTURAL AND HORTICULTURAL STUDIES

# Written examination

Wednesday 1 November 2006

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 28 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 6**, choose only **one** case study and answer the questions. There are five case studies to choose from.

# **Question 1**

Zu.		• •
a.	Plar	nt and animal environments may be modified in many ways to improve production.
	Spe	cify one way each of the following changes could be made.
	i.	Increase the temperature of a glasshouse
	ii.	Decrease the humidity in a crop
	iii.	Increase the drainage of a clay soil
	iv.	Increase the water-holding capacity of a potting mix or soil
	v.	Reduce the wind chill on sheep in a paddock
	vi.	Increase the air-filled porosity of a potting mix or soil
	vii.	Improve the structure of a compacted soil
	viii.	Increase the pH of a soil or potting mix

b.

•	/hat are the advantages and disadvantages of mulching with wood chips instead of using pla
	That are the advantages and disadvantages of mulching with wood chips instead of using planeeting between ornamental plants to conserve soil moisture?
	That are the advantages and disadvantages of mulching with wood chips instead of using planeeting between ornamental plants to conserve soil moisture?

3 + 3 = 6 marks

Total 14 marks

**a.** Choose a pest **or** disease from the list provided in Table 1. Indicate your choice by placing a **tick** in the appropriate box.

 Table 1.
 Selected pests and diseases

Diseases	
mosaic virus	
damping off	
downy mildew	
grass tetany	
pulpy kidney	
Newcastle disease	

Pests	
lice	
red-legged earth mite	
rabbits	
sheep blow fly	
aphids	
slugs	

Name a specific agricultural or horticultural industry that the pest or disease affects.
Explain how a manager would <b>prevent</b> your chosen pest or disease from occurring.
Explain how a manager would <b>treat</b> your chosen pest or disease when it does occur.

1 + 3 + 3 = 7 marks

i.	State <b>three</b> ways weeds reduce production in an agricultural or horticultural business.
ii.	Blackberry (Rubus fruticosus) is a regionally controlled declared noxious weed. What does this
	for landowners with blackberry on their property?
iii.	Choose a weed that you are familiar with from Table 2. Indicate your choice by placing a tick
iii.	Choose a weed that you are familiar with from Table 2. Indicate your choice by placing a tick appropriate box.  Table 2. Selected weeds
iii.	appropriate box.
iii.	appropriate box.  Table 2. Selected weeds
iii.	appropriate box.  Table 2. Selected weeds  Weeds  oxalis (Oxalis spp.) blackberry (Rubus fruticosus)
iii.	appropriate box.  Table 2. Selected weeds  Weeds  oxalis (Oxalis spp.)
iii.	appropriate box.  Table 2. Selected weeds  Weeds  oxalis (Oxalis spp.)  blackberry (Rubus fruticosus)  Paterson's curse (Echium plantagineum)  Cape weed (Arctotheca calendula)
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**Table 3.** Selected agricultural and/or horticultural practices

Practices	
modifying climate	
modifying soil/growing media	
modifying topography	
water management	
soil management	
controlling weeds, pests and diseases	
decision making	
managing animals and their products	
managing plants and their products	

- **a.** From the list in Table 3 select **two** practices for which there are innovations (**new or emerging** technologies, methods or developments) that you are familiar with. Place a tick in the box next to each selection.
  - **i.** Name an innovation used in one of the practices selected from Table 3 and describe how it works or how it is done.

Name	
Description	
-	
or how it is dor	ration used for the other practice you selected from Table 3 and describe how it work ne.
Description	

	_
For the inno	3 vation you described in <b>part b</b> , above, explain the effect it will have on businesses the
For the innoit.	vation you described in <b>part b.</b> above, explain the effect it will have on businesses the

Total 14 marks

 Table 4.
 Selected business types

cereal cropping	
poultry for meat	
poultry for eggs	
beef cattle	
pigs	
sheep	
dairy cows	
grape vines	
fish or yabbies	

design/construct a garden	
maintain an ornamental garden	
plants in glasshouse	
container-growing of ornamentals	
field-growing vegetables, herbs or flowers	
production of indigenous plants	
hydroponic production	
fruit tree management	
horses for recreation	

From Table 4, choose an agricultural or horticultural business that you are familiar with in terms of its business management. Place a tick in the box next to your selection.

List <b>four</b> different aspects that need to be considered when developing a business plan for your chose business type.
business type.

4 marks

					4 n
Explain how a mar	nager of your chose	n business type co	uld ensure quality	v control	4 n
Explain how a mar	nager of your chose	n business type co	uld ensure quality	/ control.	4 n
Explain how a mar	nager of your chose	n business type co	uld ensure quality	/ control.	4 n
Explain how a mar	nager of your chose	n business type co	uld ensure quality	y control.	4 n
Explain how a mar	nager of your chose	n business type co	uld ensure quality	y control.	4 n
Explain how a mar	nager of your chose	n business type co	uld ensure quality	/ control.	4 n
Explain how a mar	nager of your chose	n business type co	uld ensure quality	y control.	4 n
Explain how a mar	nager of your chose	n business type co	uld ensure quality	/ control.	4 n
Explain how a mar	nager of your chose	n business type co	uld ensure quality	y control.	4 n
Explain how a mar	nager of your chose	n business type co	uld ensure quality	/ control.	4 n

3 marks

	List <b>three</b> factors that could affect sustainability of your chosen business type the control.	at the manager <b>ca</b>
ii.	For <b>one</b> of the factors listed in <b>i.</b> above, explain how you would minimise its ris of the business.	sk to the sustainab
<b>.</b>		3 + 3 = 6  m
Exp	ain how the sustainability of your chosen business type should be evaluated.	

Total 20 marks

# Soil acidification

Soil acidification affects many areas of Victoria.

Desc	ribe two different land management practices that often lead to an increase in soil acidification.
i.	
ii.	
	2 + 2 = 4  marks

i.		
ii.		
		3 + 3 = 6  mark
Des i.	cribe one method of treating and one method of preventing soil acidification.  Treating soil acidification	
ii.	Preventing soil acidification	

On the following pages there are five case studies (Table 5) and their questions.

It is suggested that you read the **two** case studies you are most familiar with, then **select one** and answer the questions.

In Table 5 (below), **place a tick** in the box next to the case study that you are going to answer. (Answer only **one** case study. If you answer more, only the first one in the book will be marked.)

**Table 5.** Case studies

	Title	
1	Field- or container-grown plants (Pages 14–16)	
2	Organic or non-organic crop management (Pages 17–19)	
3	Shed-fed or open-grazed animal production (Pages 20–22)	
4	Free-range or shed production (Pages 23–25)	
5	Pasture management alternatives (Pages 26–28)	

#### **EITHER**

#### Case study 1 – Field- or container-grown plants

Tran has a plant nursery growing English box (*Buxus sempervirens*). Most of the plants are grown and sold in 150 mm diameter pots. Some are planted out in rows in the field and allowed to grow larger.

The potted stock is kept on a gravel growing-on area. Drainage pipes in the gravel take any excess irrigation water off the property to a roadside drain.

The field-grown plants are grown on a slight slope that has a dam at its base. Water is pumped from this dam to irrigate the plants by overhead sprinklers. Weeds are controlled by regular cultivation between the rows.

Recently a problem has developed with the water in the dam. It is a muddy colour. The colour is worse after it rains.

		_	_			_			5 mark
ldentify ( sustainab	one change le.	Tran could	make to	the drain	nage in th	ne gravel g	growing-o	n area to m	nake it mor

1 mark

	Describe one way of <b>treating</b> the muddy water to make it clearer.
	Explain two management practices Tran could use to <b>prevent</b> the muddy water problem.
[	Management practice 1
	Management practice 2

1 + 1 + (3 + 3) = 8 marks

d.

Tran is concerned with looking after the land and water resources of the property.

i.	List two environmental indicators Tran should monitor for the field-grown plants.
	Environmental indicator 1
	Environmental indicator 2
ii.	Describe what each of these indicators measures.
	Environmental indicator 1
	Environmental indicator 2
	(1+1) + (2+2) = 6  marks
Gov land	ernment regulations (Acts) exist concerning management of natural resources on privately owned
	Name one such regulation (Act) of which Tran should be aware.
ii.	Describe what effect this regulation (Act) has on the management of businesses such as Tran's.
	1 + 3 = 4  marks

#### OR

## Case study 2 – Organic or non-organic crop management

Bruce owns a small vineyard and winery. The winery and associated buildings are located at the top of a small water catchment. Water runoff from the buildings and surface runoff from the winery are diverted away from the catchment to a nearby roadside drain.

The vines are grown on a slight slope that leads away from the buildings to a dam at its base. Water is pumped from this dam to irrigate the vines by overhead sprinklers. Weeds are controlled by regular cultivation between the rows of vines.

Bruce is concerned about a problem with the water in the dam. It is a muddy colour. The colour is worse after it rains.

The vineyard has been established with conventional, non-organic methods. Bruce is thinking of changing to organic methods to grow the vines.

ì.	Discuss the advantages and disadvantages of conventional, non-organic methods of growing crops compared to organic production.
•	5 marks
,	Identify one change Bruce could make to the runoff from the winery and building area to make the business more sustainable.
	1 mark

c.

	t is the most probable cause of the muddy water?
Desc	cribe one way of <b>treating</b> the muddy water to make it clearer.
	ain two management practices Bruce could use to <b>prevent</b> the muddy water problem.  agement practice 1
Man	agement practice 2

1 + 1 + (3 + 3) = 8 marks

d.		ce is concerned with looking after the <b>land and water</b> resources of the property.  List two environmental indicators Bruce should monitor for the conventional non-organic vineyard.	
		Environmental indicator 1	
		Environmental indicator 2	
	ii.	Describe what each of these indicators measures.	
		Environmental indicator 1	
		Environmental indicator 2	
e.	Gov	(1+1)+(2+2)=6 marks ernment regulations (Acts) exist concerning management of natural resources on privately owned	
		Name one such regulation (Act) of which Bruce should be aware.	
	ii.	Describe what effect this regulation (Act) has on the management of businesses such as Bruce's.	
		1 + 3 = 4  marks	

Total 24 marks

#### OR

## Case study 3 – Shed-fed or open-grazed animal production

Sarah has just purchased a dairy farm that has been milking 200 cows. It has not been looked after very well. Next to the dairy is a large shed that had been used for pigs. This shed and the dairy are located at the top of a small water catchment. Water runoff from the sheds is diverted away from the catchment to a nearby roadside drain.

Below the buildings, the catchment has a heavily grazed pasture paddock sloping into a dam. The water from the dam is pumped to the sheds to provide stock water and can be used to irrigate the pasture using a sprinkler system. Recently a problem has developed with the water in the dam. It is a muddy colour. The colour is worse after it rains.

To get the income Sarah needs from the farm she must double the number of cows milked. Sarah is currently trying to increase the stocking rate by increasing pasture production with increased fertiliser and irrigation applications. She is considering limiting the cows' grazing time by housing them in the large shed for part of the time and feeding them purchased feed and dietary supplements.

5 mark
Identify one change Sarah could make to the runoff from the shed and dairy area to make the busines more sustainable.

c.

•	What is the most probable cause of the muddy water?
	Describe one way of <b>treating</b> the muddy water to make it clearer.
	Explain two management practices Sarah could use to <b>prevent</b> the muddy water problem.  Management practice 1
	ranagement practice i
_	
١	Management practice 2

1 + 1 + (3 + 3) = 8 marks

d.

	Environmental indicator 1
	Environmental indicator 2
ii.	Describe what each of these indicators measures.
	Environmental indicator 1
	Environmental indicator 2
_	
land	(1+1)+(2+2)=6 m remnent regulations (Acts) exist concerning management of natural resources on privately ow l.
	(1+1) + (2+2) = 6 movernment regulations (Acts) exist concerning management of natural resources on privately ow
land	remment regulations (Acts) exist concerning management of natural resources on privately own.  Name one such regulation (Act) of which Sarah should be aware.
i.	remment regulations (Acts) exist concerning management of natural resources on privately own.  Name one such regulation (Act) of which Sarah should be aware.
i.	remment regulations (Acts) exist concerning management of natural resources on privately own.  Name one such regulation (Act) of which Sarah should be aware.
i.	remment regulations (Acts) exist concerning management of natural resources on privately own.  Name one such regulation (Act) of which Sarah should be aware.
<b>i.</b>	(1+1)+(2+2)=6 material regulations (Acts) exist concerning management of natural resources on privately own.

#### OR

## Case study 4 – Free-range or shed production

Mario has a small poultry farm with a number of large sheds. It is on the edge of a town, within the town boundary. The buildings are located at the top of a small water catchment. Water runoff from the sheds is diverted away from the catchment to a nearby roadside drain.

Below the buildings, the catchment has a heavily grazed pastured paddock sloping into a small dam. The water from the dam is pumped to the sheds to provide stock water and can be used to irrigate the pasture using a sprinkler system. Recently a problem has developed with the water in the dam. It is a muddy colour. The colour is worse after it rains.

Mario runs caged battery hens for egg production. He is considering changing to free-range egg production. The space and sheds are available to run only one of these options.

•	Discuss the advantages and disadvantages of 'free-range' compared with 'caged'/'penned' birds or animals.
	5 marks
	Identify one change Mario could make to the runoff from the shed area to make the business more sustainable.
	1 mark

c.

)(	escribe one way of <b>treating</b> the muddy water to make it clearer.
Ez	explain two management practices Mario could use to <b>prevent</b> the muddy water problem.
Л	anagement practice 1
1	anagement practice 2
_	

	Environmental indicator 1
	Environmental maleator 1
	Environmental indicator 2
ii.	Describe what each of these indicators measures.
	Environmental indicator 1
	Environmental indicator 2
Gove	ernment regulations (Acts) exist concerning management of natural resources on privately or
land	
i.	Name one such regulation (Act) of which Mario should be aware.
ii.	Describe what effect this regulation (Act) has on the management of businesses such as Mario
	1 + 3 = 4  m

End of Case study 4 Question 6 – continued TURN OVER

#### OR

#### Case study 5 – Pasture management alternatives

Charlie has a small property that is used for agisting horses. It has a shed suitable for housing and grooming horses. The shed is located at the top of a small water catchment. Water runoff from the shed is diverted away from the catchment to a nearby roadside drain.

The catchment has been divided into a number of small paddocks for holding agisted horses. These are above a small dam. The water from the dam is pumped to the shed to provide stock water. It is also used to irrigate the pasture, using a sprinkler system. Recently a problem has developed with the water in the dam. It is a muddy colour. The colour is worse after it rains.

The paddocks have bare patches and some very bad weed infestations. Charlie has been trying to improve this by using fertiliser and herbicide. A local agronomist has suggested that grazing a small number of sheep and young cattle with, or in rotation with, the horses should control the weed problem and maintain a balanced pasture.

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	5 n
	entify one change Charlie could make to the runoff from the shed area to make the property stainable.
_	

c.

What is the most probable cause of the muddy water?
Describe one way of <b>treating</b> the muddy water to make it clearer.
Explain two management practices Charlie could use to <b>prevent</b> the muddy water problem.
Management practice 1
Management practice 2

1 + 1 + (3 + 3) = 8 marks

d.	Cha	rlie is concerned with looking after the <b>land and water</b> resources of the property.
	i.	List two environmental indicators Charlie should monitor when maintaining a pasture for grazing horses by only using fertiliser and herbicide.
		Environmental indicator 1
		Environmental indicator 2
	ii.	Describe what each of these indicators measures.
		Environmental indicator 1
		Environmental indicator 2
e.	Gov land	(1+1)+(2+2)=6 marks ernment regulations (Acts) exist concerning management of natural resources on privately owned
		Name one such regulation (Act) of which Charlie should be aware.
	ii.	Describe what effect this regulation (Act) has on the management of businesses such as Charlie's.
		1 + 3 = 4  marks