



Victorian Certificate of Education 2013

SUPERVISOR TO ATTACH PROCESSING LABEL HERE

STUDENT NUMBER

Letter

Figures										
Words										

AGRICULTURAL AND HORTICULTURAL STUDIES

Written examination

Thursday 14 November 2013

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>
11	11	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 (6 marks)

List **two** ways in which each of the following changes could be made to plant environments.

- increase the temperature of a glasshouse/polyhouse

- decrease the humidity in a crop

- increase the water-holding capacity of potting mix or soil

Question 2 (2 marks)

Give one advantage and one disadvantage of using windbreaks in a grazing enterprise.

advantage _____

disadvantage _____

NO WRITING ALLOWED IN THIS AREA

Question 3 (4 marks)

Explain the advantages **and** disadvantages of using a fertiliser (such as urea) rather than growing a legume (such as clover or lucerne) to improve a soil's fertility for future crops.

Question 4 (4 marks)

Topography can be modified in various ways and for various reasons.

a. Identify **two** techniques for modifying farm topography.

2 marks

b. Choose one technique identified in **part a.** for modifying farm topography and explain the benefits of this technique.

2 marks

technique _____

explanation of benefits _____

TURN OVER

Question 6 (7 marks)

Choose **one** weed from the table below.

Common name of weed	Scientific name	What it affects
artichoke thistle	<i>Cynara cardunculus</i> L	animals and plants
capeweed	<i>Arctotheca calendula</i>	animals
flickweed (also known as nursery weed or common bitter cress)	<i>Cardamine hirsuta</i>	plants, specifically horticulture/ nurseries and crops
gorse or furse	<i>Ulex europaeus</i>	animals and plants
Paterson's curse	<i>Echium plantagineum</i>	animals and plants
wild radish	<i>Raphanus raphanistrum</i>	animals and plants (especially crops)

Common name of the chosen weed _____

- a. Outline the decisions and steps that a landowner should take to **eradicate** the weed from their property over an extended period of time. 5 marks

- b. Explain the use of a specific information and communications technology (ICT) product for making decisions about, monitoring or recording the management of your selected weed. 2 marks

TURN OVER

Question 7 (11 marks)

The table below shows examples of pests and diseases of concern in Victoria.

Common name of pest or disease	Scientific name	Animal or plant it affects (host)
aphid	assorted species family: <i>Aphididae</i>	ornamental plants, vegetables
coccidiosis	<i>Eimeria spp.</i>	poultry, cattle, sheep, pigs
one of the following: cattle lice sheep lice equine lice chicken body lice	<i>Linognathus vituli</i> <i>Bovicola bovis</i> <i>Haematopinus asini</i> <i>Menacanthus stramineus</i>	cattle sheep horses fowl
hydatid tapeworm (hydatid disease)	<i>Echinococcus granulosus</i>	sheep, cattle, pigs, goats
liver fluke	<i>Fasciola hepatica</i>	sheep, goats, cattle
mastitis	The main mastitis pathogens are <i>Staphylococcus aureus</i> , <i>Streptococcus agalactiae</i> and <i>Streptococcus uberis</i> .	dairy cattle, sheep, goats
milk fever	hypocalcaemia	cattle, goats
western flower thrip	<i>Frankliniella occidentalis</i>	ornamental plants, fruit and vegetable crops

- a. Give one example of each of the following types of pest or disease from the table above. 3 marks

metazoal _____

microbial _____

metabolic _____

- b. Select one pest or disease from the table above, **other than milk fever**.

Selected pest or disease _____

- i. Describe the signs or symptoms that indicate the presence of this pest or disease. 2 marks

Question 7 – continued

NO WRITING ALLOWED IN THIS AREA

- ii. Name **one** type of agricultural or horticultural business that this pest or disease is likely to affect.

Suggest **two** ways in which this pest or disease could affect the business.

2 marks

- iii. For an agricultural or horticultural business to produce quality products, it must manage any potential threat of pest or disease.

Discuss the reasons for having a biosecurity plan and outline a biosecurity plan at the local farm level that you could develop to prevent this pest or disease from affecting the business.

4 marks

TURN OVER

Question 8 (15 marks)

New and emerging technologies are found in many areas of agriculture and horticulture.

a. Name four new and/or emerging technologies and provide a description for each one in the table below. 8 marks

Name of technology	Description
1.	
2.	
3.	
4.	

b. Choose one of the technologies described in **part a.** and identify the technology it has replaced.

1 mark

chosen technology _____

technology replaced _____

Question 8 – continued

NO WRITING ALLOWED IN THIS AREA

Question 9 (10 marks)

Agricultural and horticultural industries contribute to and are affected by climate change.

a. In the context of a large dairy, what is the **major** greenhouse gas linked to each of the following? 3 marks

- cattle

- the use of nitrogen-containing fertiliser

- the use of mains electricity in the milking shed

b. Choose **one** of the following types of business.

- dryland cropping
- dairying
- irrigated fruit trees
- urban wholesale nursery

Selected business type _____

i. Identify two changes to the climate that could have an impact on the business. Explain how each change could potentially have an impact on the business. 4 marks

Change to the climate	Potential impact on the business
1.	
2.	

Question 9 – continued

NO WRITING ALLOWED IN THIS AREA

- ii. For the type of business selected, suggest **one** management option that could be used to adapt the business to minimise the impact of climate change.

3 marks

TURN OVER

Question 10 (17 marks)

Select **one** type of commercial agricultural or horticultural business from the table below.

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

Selected business type _____

a. Describe the main product or service that your business will produce or provide.

1 mark

You have investigated the business type selected above and wish to start your own business.

To apply for finance from lenders, such as banks, you are required to develop a business plan to show that the business will be financially viable.

b. Outline the key parts of a business plan that must be included for your business.

3 marks

Question 10 – continued

- c. All agricultural and horticultural businesses have processes associated with the production of their products and services.

In the table below, name **two** processes that will occur in your chosen business and identify an occupational health and safety, regulatory or animal welfare issue associated with each process.

Give **one** strategy you could use to reduce the risks involved with each strategy.

6 marks

Process	Issue	Strategy to reduce risk
1.		
2.		

- d. Agriculturists and horticulturists need to meet certain quality standards with their products and services.

i. Define the term 'quality standard'.

2 marks

ii. Give **two** examples of a quality standard for the product or service described in **part a**.

2 marks

iii. Explain how a producer could monitor the production process in order to meet the quality standards identified in **part d.ii**.

3 marks

TURN OVER

Question 11 (20 marks)

A central Victorian mixed grazing and cropping property has several different soil types. The present owners are selling the property and several buyers have shown an interest.

One of the potential buyers employs a farm management consultant, who has visited the property and issued the following report.

‘The property is divided into several small paddocks that are of differing soil types. Stubbles in the cropping areas vary in thickness, indicating that yields differ according to the soil type, with the sandy areas yielding more than the clay soils. Soil tests indicate a pH of 4.0 in the cropping areas, compared with a pH of 5.4 in the grazing areas, and organic carbon levels are less than one per cent (<1%) across the property.

Paddock histories show that cropping areas have been planted with cereal crops for a number of successive years and increasing amounts of nitrogenous fertilisers have been added to the soil during this time. However, yields have not increased. In times of heavy rain, the run-off from the paddocks enters a natural waterway. Algal blooms appear when temperatures rise.

The grazing paddocks are continually stocked with high numbers of sheep. High levels of drift sand exist along fence lines. In times of heavy rain, water lies in the lower areas of the paddock and pasture or crop growth is poor in these areas. Animal and vehicle traffic through the area have added to the problem. When grasses do emerge, their growth is stunted.

The native vegetation in lower areas is showing signs of die-back, despite high annual rainfall. On hot days, the stock tends to lie in this area despite limited shade for them. During dry periods, a white, crystalline substance appears on the surface in lower areas of the property.’

- a. Identify three environmental degradation issues in the report above and provide evidence from the report for each issue you have identified.

6 marks

Environmental degradation issue	Evidence
1.	
2.	
3.	

Question 11 – continued

NO WRITING ALLOWED IN THIS AREA

- b. With respect to two of the issues identified in **part a.**, provide two techniques for each issue that any potential buyer of the property could use to **minimise** environmental degradation.

4 marks

Issue	Techniques
	1.
	2.
	1.
	2.

- c. Choose **one** of the techniques listed in **part b.** and explain how using this technique could decrease environmental degradation. Outline the success measures (indicators) that would show the landowner that the suggested technique is working.

5 marks

technique _____

explanation

success measures

Question 11 – continued
TURN OVER

