VICTORIAN CURRICULUM AND ASSESSMENT AUTHORITY

Victorian Certificate of Education 2017

SUPERVISOR TO ATTACH PROCESSING LABEL HERE

STUDENT NUMBER | | | | | | | | | Letter |

AGRICULTURAL AND HORTICULTURAL STUDIES

Written examination

Thursday 16 November 2017

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*
10	10	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 correction fluid/tape.
- No calculator is allowed in this examination.

Materials supplied
- Question and answer book of 20 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.

Question 1 (7 marks)

Plant and animal environments can be modified in many ways to improve production.

Specify **one** way each of the following modifications could be made.

- Increase the temperature of a glasshouse

- Decrease the humidity in a crop

- Reduce the effect of wind on a cut flower crop

- Reduce the wind chill on sheep in a paddock

- Reduce the turbidity or cloudiness of the water in a dam that is used as a source of drinking water for livestock

- Improve the structure of compacted soil

- Increase the pH of a soil or a potting mix

Question 2 (3 marks)

Hannah is considering growing commercial crops of gypsophila for the cut flower market. She is planning to grow the gypsophila in a polyhouse instead of in a field.

Outline three advantages of growing the cut flower crop in a polyhouse instead of in a field.

1. _____

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2. _____

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3. _____

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Question 3 (8 marks)

The table below shows the prescribed list of weeds for study in 2017.

Common name of weed	Scientific name
blackberry	*Rubus fruticosus* aggregate
capeweed	*Arctotheca calendula*
flickweed (also known as common bittercress)	*Cardamine hirsuta*
ragwort	*Senecio jacobaea*
serrated tussock	*Nassella trichotoma*
wild radish	*Raphanus raphanistrum*

Choose one weed, other than flickweed, from the prescribed list.

Chosen weed _____

a. Describe two steps that you could take to prevent the entry of your chosen weed into an agricultural or horticultural property. 2 marks

1. _____

_____

2. _____

_____

b. Name **one** biological control that could be used on your chosen weed and explain how it affects the weed. 3 marks

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c. Name **one** chemical, other than Roundup (glyphosate), that could be used to target your chosen weed and explain when it should be applied. 3 marks

Question 4 (15 marks)

The table below shows the prescribed list of pests and diseases for study in 2017.

Common name of pest or disease	Scientific name
aphids	assorted species
footrot	*Dichelobacter nodosus*
intestinal worms (ruminants)	assorted species
one of the following: • cattle lice • sheep lice • equine lice • chicken body lice	 • *Linognathus vituli* • *Bovicola ovis* • *Haematopinus asini* • *Menacanthus stramineus*
milk fever	hypocalcaemia
Newcastle disease virus	*Avian paramyxovirus*
one of the following: • wheat rust • barley rust • grapevine rust • rose rust	 • *Puccinia triticina* • *Puccinia hordei* • *Phakopsora euvitis* • *Phragmidium* sp.
stem and bulb nematodes	*Ditylenchus dipsaci*

a. Many farmers develop integrated pest management plans for their properties.

Explain why an integrated pest management plan is necessary, describing **two** aspects that should be included in a typical plan. 4 marks

DO NOT WRITE IN THIS AREA

b. A dairy farmer has discovered a problem with milk fever in his cows.

i. Explain the cause of milk fever. 2 marks

ii. Describe **one** method of treating milk fever. 2 marks

Choose one pest or disease, other than milk fever, from the prescribed list on page 6. Identify a specific plant or animal it would affect.

Chosen pest or disease _____

Plant or animal affected _____

c. Explain how your chosen pest or disease affects the plant or animal identified above. 2 marks

d. Describe **three** steps a farmer could take to prevent the entry of your chosen pest or disease into an agricultural or horticultural property. 3 marks

e. Explain how a farmer could control your chosen pest or disease. 2 marks

DO NOT WRITE IN THIS AREA

Question 5 (5 marks)

a. A manager needs to supply food and water to intensively managed animals kept in feed lots, cages or pens.

Outline three things, in addition to providing food and water, that the manager can do to provide the animals with the optimum environment for animal welfare. 3 marks

1. _____

_____

2. _____

_____

3. _____

_____

b. What are one advantage and one disadvantage of using animal manure to improve soil? 2 marks

Advantage _____

_____

_____

Disadvantage _____

_____

_____

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Question 6 (9 marks)

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

a. Name two greenhouse gases and, for each gas, describe the agricultural or horticultural activity that leads to the gas being produced. 6 marks

Greenhouse gas 1

Agricultural or horticultural activity that leads to this gas being produced

Greenhouse gas 2

Agricultural or horticultural activity that leads to this gas being produced

b. Choose one greenhouse gas named in **part a.**

Chosen greenhouse gas _____

Outline a management strategy that could be introduced to an agricultural or horticultural business to reduce the emission of this gas. 3 marks

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Question 7 (11 marks)

Climate change will affect agricultural and horticultural operations in Victoria. Farmers will need to adapt their farming practices to manage the impact of climate change in order to maintain production levels.

Choose one type of business from the list below:

- cropping
- animal production
- plant nursery
- orchard

Chosen type of business _____

a. Identify two key effects of climate change in Victoria on your chosen type of business. For each effect, describe its potential impact on the business. 6 marks

Effect 1 _____

Potential impact _____

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Effect 2 _____

Potential impact _____

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DO NOT WRITE IN THIS AREA

b. Describe a potential management strategy that will help to maintain the production levels of your chosen type of business and overcome the problems associated with the effects of climate change identified in **part a.** 3 marks

c. Explain how the potential management strategy described in **part b.** will increase the sustainability of your chosen type of business and meet the challenges of climate change. 2 marks

Question 8 (10 marks)

Fred and Sarah run a livestock and vegetable enterprise on an 80-hectare property.

They have 140 Angus cows and calves, along with broccoli and green leafy vegetables as crops.

Their property gently slopes to a creek, from which water is pumped for irrigation. Their livestock also have access to the creek.

Fred and Sarah have been growing their crops on a continuous cycle of planting, growing and harvesting on the same 20 hectares for the past seven years. They have recently noticed some degradation issues on their property. This has led to a decline in the growth rate of the vegetables and a reduction in total yields. The vegetables will grow in a range of soil types but the soil must be well drained and have a pH of between 6.0 and 6.5, with high nitrogen levels.

Fred and Sarah's market share depends on having a product of consistent quality and supply. In order to achieve this, their plants require regular applications of animal manure and a fertiliser that is high in nitrogen, as well as regular irrigation. They have some issues with vegetable quality – yellowing on the leaves and malformed stems. A farm consultant has suggested that they may have an acidity problem.

a. How could Fred and Sarah confirm that they have an acidity problem? 1 mark

b. Identify **two** practices on the property that could lead to soil acidification. 2 marks

c. Describe **one** management practice that could help to prevent reduced yields and malformed plants in their crops. 2 marks

DO NOT WRITE IN THIS AREA

d. List three possible land or soil degradations that could occur as a consequence of overstocking on the property. 3 marks

1. _____

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2. _____

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3. _____

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e. Explain how Fred and Sarah could rectify **one** of the degradations listed in **part d.**, other than by reducing stock. 2 marks

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DO NOT WRITE IN THIS AREA

Question 9 (16 marks)

a. Identify four new or emerging technologies that could provide some improvements to agricultural or horticultural industries. 4 marks

1. _____

2. _____

3. _____

4. _____

b. Choose two of the technologies identified in **part a.**

Chosen technology 1 _____

Chosen technology 2 _____

i. For your first chosen technology, describe how it works, its advantages and its impact on sustainability. 6 marks

How the technology works _____

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_____

_____

Advantages _____

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_____

Impact on sustainability _____

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DO NOT WRITE IN THIS AREA

ii. For your second chosen technology, describe how it works, its advantages and its impact on sustainability. 6 marks

How the technology works _____

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Advantages _____

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Impact on sustainability _____

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DO NOT WRITE IN THIS AREA

Question 10 (16 marks)

Choose one type of commercial agricultural or horticultural business from the list below:

- agroforestry
- alley farming
- alternative agriculture or horticulture systems (e.g. organics, permaculture, biodynamics)
- aquaculture
- broad acre dry land cropping
- broad acre grazing of animals
- community supported agriculture or horticulture
- conversion from traditional to organic farming
- field growing of vegetables, herbs or flowers
- fruit or nut production
- garden design and construction and/or maintenance
- glasshouse production of flowers or vegetables
- grape production
- intensive animal production
- irrigated cropping
- milk production
- nursery production of ornamental plants
- producing crops using hydroponics
- production of biofuels
- revegetation contracting
- seedling/tube stock production
- small-scale diverse agriculture or horticulture
- urban agriculture or horticulture

Chosen type of business _____

a. Outline **four** factors you would need to consider when choosing a location for the business. 4 marks

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b. Identify **one** appropriate quality standard for the main product of your chosen type of business and outline how it would be measured. 2 marks

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c. Describe **two** ways in which your chosen type of business could add value to its main product. 4 marks

d. Four broad types of risks that influence a business are listed in the table below.

Describe how each risk could affect your chosen type of business. Do not refer to occupational health and safety (OH&S) in your answer. 4 marks

Type of risk	How risk could affect your chosen type of business
environmental	
marketing	
financial	
production	

e. Explain how your chosen type of business could have an impact on the environment. 2 marks

DO NOT WRITE IN THIS AREA

END OF QUESTION AND ANSWER BOOK