STUDENT NUMBER

AGRICULTURAL AND HORTICULTURAL STUDIES

Written examination

Thursday 15 November 2018

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

<table>
<thead>
<tr>
<th>Number of questions</th>
<th>Number of questions to be answered</th>
<th>Number of marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>8</td>
<td>100</td>
</tr>
</tbody>
</table>

- 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 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 unauthorised electronic devices into the examination room.

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Instructions
Answer all questions in the spaces provided.

Question 1 (10 marks)
a. Outline two methods of modifying light levels in a commercial glasshouse or polyhouse. 2 marks
   1. __________________________________________________________
   2. __________________________________________________________

b. Describe three characteristics of soil or potting mix, which may be modified to get the best growing conditions for plants. 3 marks
   1. __________________________________________________________
   2. __________________________________________________________
   3. __________________________________________________________
c. Give three methods of maximising the birthing percentages of livestock. 3 marks

1. ____________________________

2. ____________________________

3. ____________________________

d. Identify one technique for modifying farm topography and outline one benefit associated with this technique. 2 marks

Technique ____________________________

Benefit ____________________________
**Question 2** (15 marks)
a. Identify one positive aspect and one negative aspect of a natural ecosystem and of a managed ecosystem.  

<table>
<thead>
<tr>
<th>Ecosystem</th>
<th>Positive aspect</th>
<th>Negative aspect</th>
</tr>
</thead>
<tbody>
<tr>
<td>natural</td>
<td></td>
<td></td>
</tr>
<tr>
<td>managed</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
b. There are many types of environmental degradation that can affect a farm’s production. Identify two types of land or soil degradation. For each type of degradation, describe a possible cause and a rectification strategy. 6 marks

Land or soil degradation type 1

Cause

Rectification strategy

Land or soil degradation type 2

Cause

Rectification strategy

c. Identify one water quality issue, describe the impact it could have on a business and suggest a rectification strategy. 3 marks

Water quality issue

Impact

Rectification strategy
d. Describe two environmental indicators that could be used to evaluate the success of the rectification strategies described in part b. and/or part c.  

1. 

2. 

2 marks
**Question 3** (12 marks)
The table below shows the prescribed list of weeds for study in 2018.

<table>
<thead>
<tr>
<th>Common name of weed</th>
<th>Scientific name</th>
<th>Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>blackberry</td>
<td><em>Rubus fruticosus</em> aggregate</td>
<td>animals and plants</td>
</tr>
</tbody>
</table>
| brome grass                  | The following are the most common species:  
  • *Bromus diandrus*  
  • *Bromus rigidus* | animals and plants, specifically crops |
| capeweed                     | *Arctotheca calendula*  | animals and plants            |
| Chilean needle grass         | *Nassella neesiana*     | pastures and grazing animals  |
| flickweed (also known as common bittercress) | *Cardamine hirsuta* | plants, specifically crops and those grown in nurseries or for horticulture |
| gorse/furse                  | *Ulex europaeus*        | animals and plants            |

**a.** Name two non-grass broadleaf weeds given in the prescribed list that have flowers that are mainly yellow.  
1 mark

1. ________________________________  
2. ________________________________

**b.** Chilean needle grass has been known to cause a weed problem throughout Victoria. What responsibilities do Victorians have regarding restricted weeds?  
1 mark

______________________________  
______________________________  
______________________________

**c.** The use of herbicides is widespread in market gardens, broadacre cropping, grazing enterprises and other agricultural and horticultural businesses. Give two reasons why the use of herbicides may have undesirable consequences.  
2 marks

1. ________________________________  
2. ________________________________

______________________________  
______________________________  
______________________________

**Question 3** – continued
Choose one weed from the prescribed list.

Chosen weed

**d.** In the table provided below, identify and describe two methods of controlling your chosen weed, including the best time to implement each method. Any chemical controls mentioned must include the name of the main chemical used.  

6 marks

<table>
<thead>
<tr>
<th>Method</th>
<th>Description</th>
<th>Time of implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**e.** Describe two financial impacts that your chosen weed could have on an agricultural or horticultural business.  

2 marks

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____________________________________________________________________________________

____________________________________________________________________________________

____________________________________________________________________________________

____________________________________________________________________________________
**Question 4 (10 marks)**

The table below shows the prescribed list of pests and diseases for study in 2018.

<table>
<thead>
<tr>
<th>Common name of pest or disease</th>
<th>Scientific name</th>
<th>Animal or plant it affects (host)</th>
</tr>
</thead>
<tbody>
<tr>
<td>aphids</td>
<td>assorted species</td>
<td>ornamental plants, fruit, vegetables, broadacre crops</td>
</tr>
<tr>
<td>coccidiosis</td>
<td><em>Eimeria</em> spp.</td>
<td>poultry, cattle, sheep, pigs</td>
</tr>
<tr>
<td>one of the following:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• cattle lice</td>
<td><em>Linognathus vituli</em></td>
<td>cattle</td>
</tr>
<tr>
<td>• chicken body lice</td>
<td><em>Menacanthus stramineus</em></td>
<td>poultry, horses</td>
</tr>
<tr>
<td>• equine lice</td>
<td><em>Haematopinus asini</em></td>
<td>horses</td>
</tr>
<tr>
<td>• sheep lice</td>
<td><em>Bovicola ovis</em></td>
<td>sheep</td>
</tr>
<tr>
<td>mastitis</td>
<td>The following are the main mastitis pathogens:</td>
<td>beef, dairy cattle, sheep, goats</td>
</tr>
<tr>
<td></td>
<td>• <em>Staphylococcus aureus</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• <em>Streptococcus agalactiae</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• <em>Streptococcus uberis</em></td>
<td></td>
</tr>
<tr>
<td>milk fever</td>
<td>hypocalcaemia</td>
<td>cattle, goats</td>
</tr>
<tr>
<td>primary green blowfly (or Australian sheep blowfly)</td>
<td><em>Lucilia cuprina</em></td>
<td>sheep</td>
</tr>
<tr>
<td>one of the following:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• barley rust</td>
<td><em>Puccinia hordei</em></td>
<td>barley</td>
</tr>
<tr>
<td>• grapevine rust</td>
<td><em>Phakopsora euvitis</em></td>
<td>grapevines</td>
</tr>
<tr>
<td>• rose rust</td>
<td><em>Phragmidium sp.</em></td>
<td>roses</td>
</tr>
<tr>
<td>• wheat rust</td>
<td><em>Puccinia triticina</em></td>
<td>wheat</td>
</tr>
<tr>
<td>western flower thrips</td>
<td><em>Frankliniella occidentalis</em></td>
<td>ornamental plants, fruit, vegetables</td>
</tr>
</tbody>
</table>

Choose one pest or disease from the prescribed list.

Chosen pest or disease ____________________________
a. Explain how your chosen pest or disease affects its host.  

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

b. Biosecurity is important in all agricultural and horticultural businesses. Give two methods of preventing your chosen pest or disease from entering an agricultural or horticultural property.  

1. _______________________________________________________________________

__________________________________________________________________________

2. _______________________________________________________________________

__________________________________________________________________________

c. Suggest one method of monitoring your chosen pest or disease and describe how this method would be implemented.  

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

d. How would the results of monitoring your chosen pest or disease influence any further action to be taken?  

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__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________
e. Explain how you would control your chosen pest or disease. Any chemical controls mentioned must include the name of the main chemical used. 3 marks

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________________________________________________________________________
Question 5 (13 marks)
Sally has just purchased a 300-hectare mixed-farming business. The property contains several areas of native bushland and some indigenous fauna. Along the stream running through the property there are also areas that are compacted and bare of vegetation, allowing animal manure to run off into the stream. Sally has discovered that the previous owners did not have a property management plan. She wants to make this property sustainable.

a. Explain why it is advisable for Sally to develop a property management plan. 2 marks

b. Outline the steps involved in developing a property management plan. 4 marks
c. Explain how Sally can use a property management plan to maintain the biodiversity of her remaining native bushland and indigenous fauna. 3 marks

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________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

d. What plans should Sally make to stop further degradation of the areas along the stream? 3 marks

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________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

e. Name a government regulation that requires Sally to fix the problems along the stream. 1 mark

________________________________________________________________________
Question 6 (15 marks)

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

a. Choose two new or emerging technologies that you have studied and, for each, describe how it works and name the technology it replaces or the problem it solves in the table provided below. 6 marks

<table>
<thead>
<tr>
<th>Chosen technology</th>
<th>Description</th>
<th>Technology replaced or problem solved</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

b. i. Outline two reasons why an agricultural or horticultural business would choose to invest in the first technology chosen in part a. 2 marks

1.  

2.  

ii. Apart from cost, what is one disadvantage of adopting this technology? 1 mark


Question 6 – continued
c. Evaluate the positive and negative impacts of the second technology chosen in part a. on each aspect of sustainability listed in the table provided below. 6 marks

<table>
<thead>
<tr>
<th>Aspect of sustainability</th>
<th>Positive impact</th>
<th>Negative impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>environmental</td>
<td></td>
<td></td>
</tr>
<tr>
<td>economic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>social</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Question 7 (10 marks)
Agricultural and horticultural businesses can contribute to the effects of climate change and can be affected by the effects of climate change.

a. Name the major greenhouse gas produced as a result of each of the processes or activities listed in the table provided below. 3 marks

<table>
<thead>
<tr>
<th>Process or activity</th>
<th>Major greenhouse gas produced</th>
</tr>
</thead>
<tbody>
<tr>
<td>use of tractors around a farm</td>
<td></td>
</tr>
<tr>
<td>digestion process in ruminant animals</td>
<td></td>
</tr>
<tr>
<td>decomposition of animal urine</td>
<td></td>
</tr>
</tbody>
</table>

b. Identify two expected changes to Victoria’s climate as a result of climate change. 2 marks

1. ________________________________________________________________

2. ________________________________________________________________

Choose an agricultural or horticultural business that you have studied.

Chosen business ____________________________________________________________

c. In the table provided below, indicate a positive or a negative impact that each of the expected changes identified in part b. will have on your chosen business. 2 marks

<table>
<thead>
<tr>
<th>Expected change to Victoria’s climate</th>
<th>Impact on chosen business</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
</tr>
</tbody>
</table>
d. Explain a potential management strategy that your chosen business could implement to counteract the impact of climate change and to maintain or increase its current production levels. 3 marks

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________________________________________________________________________
Question 8 (15 marks)

Choose one type of agricultural or horticultural business that you are familiar with in terms of its business operations, and indicate its main product or service.

Chosen type of business ____________________________________________________________

Main product or service ____________________________________________________________

a. Describe one quality standard for the main product or service indicated above. 2 marks

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

b. Outline the steps involved in measuring the quality standard described in part a. 1 mark

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
c. Businesses need to monitor and manage inputs and processes in order to maintain appropriate quality standards.

i. Give two inputs for your chosen type of business. 

__________________________________________________________________________

__________________________________________________________________________

ii. Choose one process and explain how your chosen type of business should monitor and manage this process in order to maintain appropriate quality standards.

Process ______________________________________________________________

Explanation _______________________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

d. Describe two methods that could be used to analyse the financial performance of your chosen type of business.

1. ____________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

2. ____________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________
e. An essential step before starting a business is to prepare a business plan.

Outline the key components that need to be included in the business plan for your chosen type of business. 3 marks

_________________________________________________________________________________________________________

_________________________________________________________________________________________________________

_________________________________________________________________________________________________________

_________________________________________________________________________________________________________

_________________________________________________________________________________________________________

_________________________________________________________________________________________________________

f. Give one water management technique that your chosen type of business could use to show that it uses water wisely. Explain how the technique makes water management more sustainable. 3 marks

Technique _____________________________________________________________

_________________________________________________________________________________________________________

Explanation _____________________________________________________________

_________________________________________________________________________________________________________

_________________________________________________________________________________________________________

_________________________________________________________________________________________________________