AGRICULTURAL AND HORTICULTURAL STUDIES

Written examination

Wednesday 5 November 2008
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>7</td>
<td>7</td>
<td>100</td>
</tr>
</tbody>
</table>

- 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 15 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.
Question 1

a. List four ways a glasshouse or a poly house changes the environment of the plants growing inside.
   i. ____________________________________________________________  
   ii. ____________________________________________________________  
   iii. ____________________________________________________________  
   iv. ____________________________________________________________  
   4 marks

b. The moisture content of soil or potting mix influences how well a plant grows. Apart from moisture content, list three other characteristics of soil or potting mix that may be modified to get the best growing conditions for plants.
   i. ____________________________________________________________  
   ii. ____________________________________________________________  
   iii. ____________________________________________________________  
   3 marks

c. List three ways a property manager could reduce the impact of frost damage on plants.
   i. ____________________________________________________________  
   ii. ____________________________________________________________  
   iii. ____________________________________________________________  
   3 marks

d. Describe three things a manager can do to ensure grazing animals have the optimum environment for production.
   i. ____________________________________________________________  
   ii. ____________________________________________________________  
   iii. ____________________________________________________________  
   3 marks
e. What are the advantages and disadvantages of using animal manure instead of artificial fertilisers to improve soil?

______________________________________________________________________
______________________________________________________________________
______________________________________________________________________
______________________________________________________________________
3 marks

f. What are the advantages and disadvantages of using hydroponics to grow crops instead of growing them as field crops?

______________________________________________________________________
______________________________________________________________________
______________________________________________________________________
______________________________________________________________________
3 marks
Total 19 marks
Question 2
Choose one pest or disease from the list provided in Table 1 (below). Show your choice by placing a tick in the appropriate box.

Table 1. Selected pests and diseases

<table>
<thead>
<tr>
<th>red-legged earth mite</th>
<th>thrips</th>
</tr>
</thead>
<tbody>
<tr>
<td>footrot</td>
<td>ticks</td>
</tr>
<tr>
<td>mastitis</td>
<td>rust</td>
</tr>
<tr>
<td>blackspot</td>
<td>coccidiosis</td>
</tr>
<tr>
<td>botflies</td>
<td>brown stomach worm</td>
</tr>
<tr>
<td>citrus gall wasp</td>
<td>soft brown scale</td>
</tr>
</tbody>
</table>

a. What specific business type does your chosen pest or disease affect?

b. Use the following questions to describe in detail an integrated management strategy to prevent and control your chosen pest or disease.
   i. What are the symptoms (signs) that show the pest or disease is present and how is the extent and stage of development of the pest or disease monitored?

ii. How is the source of the pest or disease controlled? Include, where possible, how the host’s environment can be managed so that it does not favour the pest or disease species.
iii. Which chemical, mechanical and/or biological control methods may be used to treat the pest or disease?

____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

iv. What critical timing is required for the above treatments to efficiently manage the pest or disease?

____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

Total 9 marks

Question 3

a. List five ways in which weeds can be spread.
   i. ____________________________
   ii. ____________________________
   iii. ____________________________
   iv. ____________________________
   v. ____________________________

   5 marks

b. Name two weeds that are spread by two of the ways listed in part a.
   i. weed name __________ spreading method 1 ______________
   ii. weed name __________ spreading method 2 ______________

   2 marks

Total 7 marks
Question 4
From the list in Table 2 (below), select two technological areas for which you know an example of new or emerging technologies. Show your selection by placing the number 1 and the number 2 in the box next to your chosen technological areas.

Table 2. Examples of some technological areas

<table>
<thead>
<tr>
<th>environment modification</th>
<th>reproduction control</th>
</tr>
</thead>
<tbody>
<tr>
<td>water management</td>
<td>breeding and genetics</td>
</tr>
<tr>
<td>decision making</td>
<td>soil management</td>
</tr>
<tr>
<td>resource allocation and management</td>
<td>storage and transportation</td>
</tr>
<tr>
<td>plant production</td>
<td>animal production</td>
</tr>
</tbody>
</table>

a. Name an example of a new or emerging technology in your selected technological area 1.

i. What type of agricultural or horticultural business will use this new or emerging technology?

ii. Describe how this technology works or is used.

iii. How is this an improvement over previously used technology?

1 + 2 + 3 = 6 marks
b. Name an example of a new or emerging technology in your selected technological area 2.

i. What type of agricultural or horticultural business will use this new or emerging technology?

ii. Describe how this technology works or is used.

iii. How is this an improvement over previously used technology?

1 + 2 + 3 = 6 marks
Total 12 marks
Question 5

a. Explain the physical process of how rain and surface water flow contribute to soil erosion.

b. Describe three things that happen as a result of erosion caused by water.
c. Describe three strategies land managers should use to stop erosion caused by water while maintaining short-term economic production.

strategy 1

strategy 2

strategy 3

3 marks

3. Describe three strategies land managers should use to repair land affected by erosion caused by water while maintaining long-term economic production.

strategy 1

strategy 2

strategy 3

3 marks

Total 12 marks
Question 6
Freda wants to buy a small property to use for a mixed organic grazing and horticultural business. Organic produce must be grown without the use of pesticides. Animal manures are used as fertilisers. Freda needs a property with healthy soil and water supply. She needs to be sure that there will be no chance of pollution by pesticides and fertilisers from surrounding farms. She will use a number of environmental indicators to test potential properties.

Table 3. Environmental indicators
<table>
<thead>
<tr>
<th>plant species present</th>
<th>number of pests</th>
<th>rainfall</th>
<th>number of pest predators</th>
</tr>
</thead>
<tbody>
<tr>
<td>soil bulk density</td>
<td>soil pH</td>
<td>tree cover</td>
<td>soil organic matter</td>
</tr>
<tr>
<td>soil salt levels</td>
<td>water table level</td>
<td>soil fertility</td>
<td>pesticide residue in the soil</td>
</tr>
<tr>
<td>soil structure</td>
<td>extent of soil erosion</td>
<td>prevailing winds</td>
<td>area of remnant vegetation</td>
</tr>
</tbody>
</table>

a. From the environmental indicators in Table 3 (above), select the two most relevant indicators that Freda should use to **assess the suitability of the property for organic production**. Explain how these two indicators would help Freda to decide whether the property is suitable for her proposed business.

indicator 1

explanation

indicator 2

explanation

2 + 2 = 4 marks

b. Freda is concerned that the runoff from the property may pollute a nearby watercourse. Name two indicators, **not** listed in Table 3, that she should investigate to assess whether runoff could become a problem.

indicator 1

indicator 2

2 marks
c. When Freda purchases the property, what steps should she take to establish a whole property management plan?

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

3 marks

d. Once the business is established, explain how Freda should manage her property to minimise the chance of water degradation in dams and streams on the property.

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

5 marks
e. Explain the advantages of organic production with regard to biodiversity, biomass, efficient use of energy and cycling of matter.

f. Explain the likely impacts of converting to organic production with reference to all aspects of sustainability.
Question 7
From Table 4 (below), choose one agricultural or horticultural business that you are familiar with in terms of its business management. Show your choice by placing a **tick** in the appropriate box.

Table 4. Selected business types

<table>
<thead>
<tr>
<th>Business Type</th>
<th>End Product/Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>cereal cropping</td>
<td>garden design/construction</td>
</tr>
<tr>
<td>poultry for meat</td>
<td>ornamental garden maintenance</td>
</tr>
<tr>
<td>poultry for eggs</td>
<td>glasshouse plants</td>
</tr>
<tr>
<td>beef cattle</td>
<td>container-growing ornamentals</td>
</tr>
<tr>
<td>pigs</td>
<td>field grown vegetables, herbs or flowers</td>
</tr>
<tr>
<td>sheep or goats</td>
<td>production of indigenous plants</td>
</tr>
<tr>
<td>dairy cows</td>
<td>hydroponic production</td>
</tr>
<tr>
<td>grape vines</td>
<td>production of fruit/nuts from trees</td>
</tr>
<tr>
<td>fish or yabbies</td>
<td>horses for recreation</td>
</tr>
<tr>
<td>turf production</td>
<td>rearing rabbits for pet or meat market</td>
</tr>
</tbody>
</table>

a. What is the **specific** end product or service of your chosen business?

___________________________________________________________________________________________________________________________________________________________________________

1 mark

b. Describe how the industry the business belongs to measures the quality of this end product or service.

___________________________________________________________________________________________________________________________________________________________________________
___________________________________________________________________________________________________________________________________________________________________________
___________________________________________________________________________________________________________________________________________________________________________
___________________________________________________________________________________________________________________________________________________________________________
___________________________________________________________________________________________________________________________________________________________________________

3 marks
c. Describe in detail all the steps typically involved in getting your selected business’s product or service to the end consumer; that is, describe the marketing channel. Use diagrams if necessary.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

3 marks

d. Most businesses have a number of risk factors that influence their sustainability. What is the major environmental risk to the type of business you have chosen?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

1 mark
e. Explain how a manager would minimise the impact of this risk. Include a number of actions and an overall strategy in your answer.

f. What records must a business keep in order to document its cash flow?

g. Explain the differences between productivity, profitability and sustainability as they relate to agricultural and horticultural businesses.