INSTRUCTIONS

1. This examination has **TWO** Sections. Both Sections are **COMPULSORY**.

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Marks</th>
<th>Suggested Time Allowed</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>MULTIPLE CHOICE</td>
<td>20</td>
<td>40 minutes</td>
</tr>
<tr>
<td>B</td>
<td>SHORT ANSWERS</td>
<td>100</td>
<td>140 minutes</td>
</tr>
</tbody>
</table>

2. Write all answers to Multiple Choice questions in the answer sheet on page 31.
3. Answer all questions in **Section B** in the spaces provided.
4. Write your **Student Personal Identification Number (SPIN)** in the box at the top right hand corner of this page and on the last page of this booklet.
5. Check that this booklet contains pages 2 – 31 in the correct order without any blank page.

YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR BEFORE YOU LEAVE THE EXAMINATION ROOM.


Study Figure 1 and answer question 1.

Figure 1: Natural Ecosystem

1. The function of the natural ecosystem above in Figure 1 to our agricultural water is ____________.
   A. foul  
   B. filter  
   C. taint  
   D. pollute

2. The main cause of deforestation in Tonga is to provide more room for ____________.
   A. beef cattle  
   B. sheep farms  
   C. planting crops  
   D. building houses
Study **Figure 2** and answer questions 3 to 5.

**Figure 2: Soil Decomposer**

3. The soil decomposer in **Figure 2** is ________________.
   
   A. Fungi  
   B. Protozoa  
   C. Earthworm  
   D. Tapeworm

4. The soil decomposers shown in **Figure 2** are very important to Soil Structure. Their importance is to ________________.
   
   A. loosen soil particles  
   B. aerate the soil particles  
   C. provide passageways for lime and minerals  
   D. cement soil particles together in water-stable aggregates

5. The farm practice that could assist the soil decomposers in **Figure 2** to improve structureless soil without structure is ________________.
   
   A. keeping the soil moist  
   B. continuous tilling of land  
   C. applying ammonium sulphate  
   D. decreasing the pH of the soil to 3.5
Study **Figure 3** and answer questions 6 and 7.

**Figure 3: Seed Germination Experiment**

You are investigating how different environmental conditions affect the germination of a seed.

**Material:**

*Bean seeds (soaked overnight), paper towels, water*
*Baggies for storage of seeds, window with sunlight*
*Drawer (dark), Ziploc baggies, weak acid solution, refrigerator*

6. **Seed germination** depends on both internal and external conditions. In this experiment the most important external factor required for germination is ____________.

   A. water  
   B. baggies  
   C. refrigerator  
   D. paper towels

7. The air that provides energy to the seedling during the germination period is in the form of ______________.

   A. oxygen  
   B. nitrogen  
   C. hydrogen  
   D. carbon dioxide
Study **Figure 4** and answer question 8.

**Figure 4: Vanilla Pinching**

8. The purpose in practicing pinching in vanilla as shown in **Figure 4** is to ________________.

A. stimulate growth  
B. stimulate flowering  
C. induce pod growth  
D. induce pod maturity

Study **Figure 5** and answer questions 9 and 10.

**Figure 5: Tomato Disease**

9. The tomato plant shown in **Figure 5** is infected by ____________.

A. virus  
B. fungi  
C. bacteria  
D. nematodes
10. The disease of tomato shown in Figure 5 could best be controlled by ____________.

A. rotating  
B. mulching  
C. composting  
D. spraying with Penicillin

Study Figure 6 and answer question 11.

**Figure 6: Taro Hawks Worm**

11. The mouth part of Taro Hawks Worm in Figure 6 is called ____________.

A. piercing  
B. lapping  
C. sucking  
D. chewing

Study Figure 7 and answer questions 12 and 13.

**Figure 7: Cow’s digestive System**
12. The role of the **Abomasum** in the digestive system of a cow as shown in **Figure 7** is _________________.

   A. secretion of bile  
   B. activation of hydrochloric acids  
   C. secretion of bicarbonate acids  
   D. production of hydrochloric acids

13. In the process of digestion in a cow, the absorption of simple sugars (monosaccharide) is known to occur most in the ________________.

   A. omasum  
   B. abomasum  
   C. small intestine  
   D. large intestine

14. The growth rate of indigenous pigs (local) is 8 g/day. The introduction of exotic breeds such as **Large White boar** improves the growth rate of indigenous pigs to 30 g/day. The cause of this variance could best be explained as the ____________________________.

   A. maintaining of indigenous pigs increases the genetic variance.  
   B. using of indigenous Large White boar reduces the genetic variance.  
   C. introducing of unrelated Large White increases the genetic variance.  
   D. introducing of unrelated Large White decreases the genetic variance.

15. Prolapsed is a ________________ disease in cattle.

   A. viral  
   B. genetic  
   C. bacterial  
   D. nutritional
Study **Figure 8** and answer question 16.

**Figure 8: Drenching Cow**

16. The purpose of drenching cows as shown in **Figure 8** is to control ________.
   
   A. lice  
   B. mites  
   C. ticks  
   D. nematodes

Study this information from **Toloa Dairy Farm** and answer questions 17 and 18.

**Table 1: Individual Cow’s Record**

<table>
<thead>
<tr>
<th>Cow’s Number</th>
<th>Average Milk/liter/day</th>
<th>Bred Date 2011</th>
<th>Calving Date 2012</th>
<th>Bred Date 2013</th>
<th>Calving Date 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>16</td>
<td>Jan 1</td>
<td>10 Oct</td>
<td>1 Apr</td>
<td>8 Jan</td>
</tr>
<tr>
<td>2</td>
<td>18</td>
<td>Jan 2</td>
<td>-</td>
<td>2 Apr</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>13</td>
<td>Jan 3</td>
<td>12 Oct</td>
<td>3 Apr</td>
<td>10 Jan</td>
</tr>
<tr>
<td>4</td>
<td>10</td>
<td>Jan 4</td>
<td>13 Oct</td>
<td>4 Apr</td>
<td>11 Jan</td>
</tr>
<tr>
<td>5</td>
<td>22</td>
<td>Jan 4</td>
<td>14 Oct</td>
<td>5 Apr</td>
<td>12 Jan</td>
</tr>
<tr>
<td>6</td>
<td>12</td>
<td>Jan 5</td>
<td>15 Oct</td>
<td>6 Apr</td>
<td>13 Jan</td>
</tr>
<tr>
<td>7</td>
<td>7</td>
<td>Jan 6</td>
<td>-</td>
<td>7 Apr</td>
<td>-</td>
</tr>
<tr>
<td>8</td>
<td>15</td>
<td>Jan 7</td>
<td>17 Oct</td>
<td>8 Apr</td>
<td>15 Jan</td>
</tr>
<tr>
<td>9</td>
<td>14</td>
<td>Jan 8</td>
<td>18 Oct</td>
<td>9 Apr</td>
<td>16 Jan</td>
</tr>
<tr>
<td>10</td>
<td>11</td>
<td>Jan 9</td>
<td>19 Oct</td>
<td>10 Apr</td>
<td>17 Jan</td>
</tr>
</tbody>
</table>

17. The cow with the highest milk production and should be retained at the **Toloa Farm** is cow number ________.

   A. 1  
   B. 5  
   C. 7  
   D. 10
18. Which cow should be culled from Toloa Farm?
   A. Cow number 1 and 2.
   B. Cow number 5 and 6.
   C. Cow number 9 and 10.
   D. Cow 2 number 2 and 7.

Study the Monthly Prices of Pork at Si‘i Kae-Ola Supermarket

Table 2: Monthly Prices of Pork in December 2012 and 2013

<table>
<thead>
<tr>
<th>December</th>
<th>2012 ($)/kg</th>
<th>2013 ($)/kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Live weight (kg)</td>
<td>8.50</td>
<td>14.60</td>
</tr>
<tr>
<td>Carcass Weight (kg)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loin</td>
<td>15.35</td>
<td>15.55</td>
</tr>
<tr>
<td>Carcass LMA (Loin Muscle Area)(10th rib)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ham</td>
<td>14.25</td>
<td>15.05</td>
</tr>
<tr>
<td>Belly</td>
<td>12.15</td>
<td>12.95</td>
</tr>
<tr>
<td>Shoulder</td>
<td>13.67</td>
<td>14.95</td>
</tr>
</tbody>
</table>

- LMA Loin Muscle Area

19. Which pork carcass provides the highest price at Si‘i Kae-Ola Supermarket as shown in Table 2?
   A. Loin
   B. Ham
   C. Belly
   D. Shoulder

Study Figure 9 and answer question 20.

Figure 9: Pork Meat displayed at Si’i-Kae-Ola Supermarket

20. The attribute of Pork Meat in Figure 9 which attracts customers is __________.
   A. size
   B. juice
   C. taste
   D. color
SECTION B: SHORT ANSWERS (100 MARKS)

Answer ALL questions in the spaces provided.

QUESTION ONE: AGRICULTURAL ECOSYSTEM (10 Marks)

Study Figure 10 below and answer the questions that follow.

Figure 10: Mixed Farming System

a. What is Mixed Farming System?

____________________________________________________________________________
____________________________________________________________________________

(1 mark)

b. Describe THREE (3) benefits of Mixed Farming System.

i. ______________________________________________________________________
______________________________________________________________________

ii. ______________________________________________________________________
______________________________________________________________________

iii. ______________________________________________________________________
______________________________________________________________________

(3 marks)
Study **Figure 11** below and answer the questions that follow.

**Figure 11: Conventional Cabbage Farm in Veitongo** (farm relied on Chemical)

![Conventional Cabbage Farm in Veitongo](image)

**c.** Explain THREE (3) practices to speed the growth of Cabbages in **Figure 10**.

i. ______________________________________________________________________

ii. ______________________________________________________________________

iii. ______________________________________________________________________

(3 marks)

**d.** Explain **THREE (3) negative impacts** of Conventional Cabbage production on the environment.

i. ______________________________________________________________________

ii. ______________________________________________________________________

iii. ______________________________________________________________________

(3 marks)
a. Name the tillage equipment in Figure 12. B above.

____________________________________________________________________________  

(1 mark)

b. State TWO (2) benefits of tilling the soil shown in Figure 12. A above.

i.  

ii.  

(2 marks)

c. Describe THREE (3) negative impacts of tilling the soil in Figure 12. A in relation to soil structure.

i.  

ii.  

iii.  

(3 marks)
d. Explain **THREE** (3) appropriate practices of tilling the soil in Figure 12. A in order to minimize its negative impact on soil. (As explained in c above).

i. 

ii. 

iii. 

(3 marks)

e. Explain the relationship between the ploughed land in Figure 12. A and Soil Erosion.

i. 

ii. 

iii. 

(3 marks)

f. Explain **THREE** (3) farming practices that can be used to prevent soil erosion.

i. 

ii. 

iii. 

(3 marks)
QUESTION THREE: PLANT PRODUCTION (15 Marks)

Use the information provided and Figure 13 below to answer the questions that follow.

Figure 13: Tomato plantation

a. Name the management practiced above in Figure 13.

____________________________________________________________________________

(1 mark)

b. State TWO (2) advantages of practicing the activity shown on Figure 13 above.

i. _______________________________________________________________________

ii. _____________________________________________________________________

(2 marks)

c. Describe THREE (3) disadvantages of NOT practicing the activity shown on Figure 13 above.

i. _______________________________________________________________________

ii. _____________________________________________________________________

iii. ____________________________________________________________________

(3 marks)
Study **Graph 1** below and answer the questions that follow.

**Graph 1: Nitrogen Fertilizer and Yield of Tomatoes**

![](Graph_1.png)

(a) Explain the relationship of Nitrogen Fertilizer application to the yield of tomatoes in **Graph 1** above.

____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________

(2 marks)

(b) Explain **THREE** (3) roles of Nitrogen fertilizer in the **growth stage** of tomatoes.

i. Establishment

____________________________________________________________________________
____________________________________________________________________________

(1 mark)

ii. Vegetative growth

____________________________________________________________________________

(1 mark)
iii. Flowering to Fruit set

______________________________________________________________________

______________________________________________________________________

(1 mark)

f. Describe **TWO** (2) symptoms of the deficiencies of Nitrogen in tomatoes.

i. ______________________________________________________________________

ii. _____________________________________________________________________

(2 marks)

g. List **TWO** (2) sources of Nitrogen fertilizer for tomatoes.

i. ______________________________________________________________________

ii. ______________________________________________________________________

(2 marks)
QUESTION FOUR: PLANT PROTECTION (15 Marks)

Study Figure 14 and answer the questions that follow:

Figure 14: Fruit Fly Metamorphosis

a. Name the mouthpart of an adult fruit fly.

____________________________________________________________________________ (1 mark)

b. Name the mouthpart of larva.

____________________________________________________________________________ (1 mark)

c. Name the stage of fruit flies life cycle that causes the damage in fruit crops.

____________________________________________________________________________ (1 mark)

d. Describe THREE (3) ways of which fruit flies damage fruit trees.

i.  ______________________________________________________________________

ii.  _____________________________________________________________________

iii.  ____________________________________________________________________ (3 marks)
e. Explain **THREE (3) methods** to control fruit flies on fruit trees.

i. __________________________________________________________________________

ii. __________________________________________________________________________

iii. __________________________________________________________________________

(3 marks)

Read the information below and answer the questions that follow:

**Import Health Standard**
**Commodity Sub-class: Fresh Fruit/Vegetables**
**Tomato, Lycopersicon esculentum from Tonga**
**ISSUED**
**Issued pursuant to Section 22 of the Biosecurity Act 1993**
**Date Issued: 14 December 1998**

**GENERAL CONDITIONS FOR ALL PLANT PRODUCTS**

All plants and plant products are PROHIBITED entry into New Zealand, unless an import health standard has been issued in accordance with Section 22 of the Biosecurity Act 1993. Should prohibited plants or plant products be intercepted by the New Zealand Ministry of Agriculture and Forestry, the importer will be offered the option of reshipment or destruction of the consignment.
## SPECIFIC CONDITIONS FOR TOMATOES FROM TONGA

This import health standard covers the requirements for the entry of tomatoes, commodity sub-class: fresh fruit/vegetables from Tonga only.

### 1 PRE-EXPORT REQUIREMENTS

#### 1.1 Inspection of the consignment

The New Zealand Ministry of Agriculture and Forestry requires that the Tonga national plant protection organisation sample and inspect the consignment according to official procedures for all visually detectable regulated pests (as specified by the New Zealand Ministry of Agriculture and Forestry), with a 95% confidence level, that not more than 0.5% of the units in the consignment are infested (this equates to an acceptance level of zero units infested by quarantine pests in a sample size of 600 units).

#### 1.2 Testing of the consignment

Testing of the consignment prior to export to New Zealand for quarantine pathogens which are not visually detectable is not generally required for fresh tomatoes from Tonga.

#### 1.3 Documentation

**Bilateral quarantine arrangement:**

Required: Tomatoes, commodity sub-class: fresh fruit/vegetables, may only be imported into New Zealand from Tonga under the terms of the bilateral quarantine arrangement.

**Import permit/Authorisation to import:**

Exempt under Gazette Notice: No. AG12, 13 July 1995.

**Phytosanitary certificate:**

Required.

#### 1.4 Phytosanitary certification

A completed phytosanitary certificate issued by the Tonga national plant protection organization must accompany all tomatoes, commodity sub-class: fresh fruit/vegetables exported to New Zealand. Before an export phytosanitary certificate is to be issued, the Tonga national plant protection organisation must be satisfied that the following activities required by the New Zealand Ministry of Agriculture and Forestry have been undertaken. The tomatoes have:

- been inspected in accordance with appropriate official procedures and found to be free of visually detectable quarantine pests specified by the New Zealand Ministry of Agriculture and Forestry.

  **AND**

- undergone an agreed treatment that is effective against fruit flies.

  **AND**

- undergone appropriate pest control activities that are effective against: Bemisia tabaci [strain] Liriomyza trifolii

  **OR**

  been sourced from an area free (verified by an official detection survey) from the following: Bemisia tabaci [strain] Liriomyza trifolii

Note: Combinations of treatments and area freedom are permissible for the aforementioned risk group 2 quarantine pests.
1.5 Additional declarations to the phytosanitary certificate
If satisfied that the pre-export activities have been undertaken, the Tonga national plant protection organisation must confirm this by providing the following additional declarations to the phytosanitary certificate: "The tomatoes in this consignment have:
- been inspected in accordance with appropriate official procedures and found to be free of any visually detectable quarantine pests specified by the New Zealand Ministry of Agriculture and Forestry.
AND
- been treated in accordance with Appendix 2 of the Workplan between the New Zealand Ministry of Agriculture and Forestry and the Tonga national plant protection organization concerning the access of host material of fruit fly species of economic significance into New Zealand from Tonga.
AND
- undergone appropriate pest control activities that are effective against: Bemisia tabaci [strain] Liriomyza trifolii
OR
been sourced from an area free (verified by an official detection survey) from the following: Bemisia tabaci [strain] Liriomyza trifolii."
Note: Combinations of treatments and area freedom are permissible for the aforementioned risk group 2 quarantine pests.

2 TRANSIT REQUIREMENTS
The tomatoes must be packed and shipped in a manner to prevent contamination by regulated pests. The package should not be opened in transit. However, where a consignment is either stored, split up or has its packaging changed while in another country (or countries) en route to New Zealand, a "Re-export Certificate" is required. Where a consignment is held under bond, as a result of the need to change conveyances, and it is kept in the original shipping container, a "Re-export Certificate" is not required.

6.3 INSPECTION ON ARRIVAL
The New Zealand Ministry of Agriculture and Forestry will check the accompanying documentation on arrival to confirm that it reconciles with the actual consignment. The New Zealand Ministry of Agriculture and Forestry requires, with 95% confidence, that not more than 0.5% of the units (for tomatoes, a unit is one fruit) in a consignment are infested with visually detectable quarantine pests. To achieve this, the New Zealand Ministry of Agriculture and Forestry will sample and inspect 600 units with an acceptance level of zero infested units (or equivalent), from the (homogeneous) lot.

2 BIOSECURITY/QUARANTINE DIRECTIVE
The commodity may be directed to a facility for further treatment if required. IHS Fresh Fruit/Vegetables. Tomato, Lycopersicon esculentum from Tonga (Biosecurity Act 1993)
f. Explain **FOUR** (4) specific export requirement conditions that must be followed in order to allow Tongan tomatoes in New Zealand markets.

i. _____________________________________________________________________

ii. _____________________________________________________________________

iii _____________________________________________________________________

iv _____________________________________________________________________

(4 marks)

g. Explain **TWO** (2) reasons why plants and plant products are prohibited entry into New Zealand.

i. _____________________________________________________________________

ii. _____________________________________________________________________

(2 marks)
QUESTION FIVE: ANIMAL PRODUCTION (15 Marks)

Study the information in Table 3 and Table 4 below and answer the questions that follow.

Mr ‘Ata Leka bred his Angus cow with Hereford bull. The strength and weakness of each breed presented in Table 3, and Table 4 is the economic value, heritability, and heterosis (hybrid vigour) of Angus X Hereford offspring.

**Table 3: Cattle Breed**

<table>
<thead>
<tr>
<th>Breed</th>
<th>Strength</th>
<th>Weakness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angus</td>
<td>Maternal (inheriting mother’s side)</td>
<td>Fat Disposition</td>
</tr>
<tr>
<td></td>
<td>Marbling (amounts of intramuscular fat)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Calving ease</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Grow Fast</td>
<td></td>
</tr>
<tr>
<td>Hereford</td>
<td>Hardiness (environment adaptability)</td>
<td>Low Milk</td>
</tr>
<tr>
<td></td>
<td>Low Fat Disposition</td>
<td>Prolapses</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Eye cancer</td>
</tr>
</tbody>
</table>

**Table 4: Economic value, heritability, heterosis of Angus X Hereford offspring.**

<table>
<thead>
<tr>
<th>Trait</th>
<th>Economic Value</th>
<th>Heritability %</th>
<th>Heterosis %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reproduction</td>
<td>High</td>
<td>Low (5 – 12%)</td>
<td>12</td>
</tr>
<tr>
<td>Maternal</td>
<td>Moderate</td>
<td>Low to moderate (&gt;20%)</td>
<td>15</td>
</tr>
<tr>
<td>Marbling</td>
<td>Moderate</td>
<td>Moderate (&gt; 25%)</td>
<td>17</td>
</tr>
<tr>
<td>Growth</td>
<td>High</td>
<td>Moderate (12-20%)</td>
<td>11 – 19</td>
</tr>
<tr>
<td>Product</td>
<td>Low</td>
<td>High (40-50%)</td>
<td>16</td>
</tr>
</tbody>
</table>
a. Define the following terms.

i. Heritability

ii. Cross Breeding

iii. Heterosis

(3 marks)

b. Compare the difference between the growth traits of parents and its offspring.

(3 marks)

c. Describe THREE (3) advantages of Crossing Angus Cow and Hereford Bull as shown above.

i. 

ii. 

iii. 

(3 marks)
Study **Figure 15** and answer the question that follows:

**Figure 15: Cow Oestrus and Ovulation Cycle**

---

**d.** What is **ovulation**?

____________________________________________________________________________

(1 mark)

**e.** Give **ONE** (1) sign of Oestrus Cycle.

____________________________________________________________________________

(1 mark)

Mr ‘Ata Leka mated his Angus Bull with his Hereford Cow on the 23rd of February 2014.

**f.** When would you expect the cow to calve if the mate was successful?

____________________________________________________________________________

(1 mark)

Mr ‘Ata Leka fed his cows with **Guinea Grass** (Saafa) and **Siratro** (legume).

**g.** Describe the steps of which a cow produces carbohydrates from the breaking down of Guinea Grass?

i. ______________________________________________________________________
   ______________________________________________________________________

ii. ______________________________________________________________________
   __________________________

iii. ______________________________________________________________________
   __________________________

(3 marks)
QUESTION SIX

ANIMAL PROTECTION

(10 marks)

Study the information in Figure 16 and answer the questions that follow.

**Figure 16: Premature Calving**

Mr ‘Isileli Moimoi found the following signs in his cows before they were aborted:

- Loss of appetite
- Excessive sweating
- Weak
- Premature calving happened after 6.5 months of pregnancy.

a. Name the disease that has infected the cows as shown in Figure 16 above.

____________________________________________________________________________

(1 mark)

b. Identify the organism that caused the premature calving of Mr ‘Isileli Moimoi’s cattle farm.

____________________________________________________________________________

(1 mark)

c. Describe how you would treat the infected cows in Figure 16 above.

i.  ______________________________________________________________________

ii.   ______________________________________________________________________

(2 marks)
d. Describe how this disease is spread from cow to cow.
   i.                                                                                   
   ii. .......................................................................................................................... (2 marks)

e. Explain FOUR (4) activities Mr 'Isileli Moimo should practice to prevent and control the spread of this disease.
   i.                                                                                   
   ii.                                                                                   
   iii.                                                                                   
   iv. .......................................................................................................................... (4 marks)
Read the information below and answer the questions that follow:

THE IMPORTANCE OF KEEPING GOOD FARM RECORDS
The key to becoming a successful farmer today is being a good producer as well as a good financial manager. The first step in being a successful farm manager is keeping good, accurate records and establishing a sound record-keeping system. There is a misconception that the only reason a person needs records is so he or she can report their taxes. However, record keeping plays a much larger role in business. Farming is a business and records can be helpful in planning improvements for that business, and making proper management decisions.

Farm managers need a complete and accurate farm records system in order to make informed management decisions that will help maintain or improve farm business profitability. Records can help the manager plan and implement farm business arrangements and do estate and other transfer farming. Also, farm managers can use records to determine what the efficiencies and the inefficiencies are, measure progress of the business and plan for the future.

There are many farm record systems. They range from simple, hand accounting systems using pencil and paper to sophisticated double-entry computer-accounting systems, which require computer operations. Some require a mix of hand and computer operations. Choose a system that is easy to understand and designed specially for farm managers. It should not only meet the accounting and planting needs of the farm operation, but it should also satisfy income tax, legal, and other outside reporting requirements.

Remember a good record-keeping system is one that will provide the necessary information and provide the information when needed. It will furnish the necessary information for understanding the activities of your farm operation.

James Hartsfield
Area Extension Farm Management Agent

a. What are the keys to becoming a successful farmer?
   i.  ______________________________________________________________________
   ii.  ______________________________________________________________________

   (2 marks)
b. Describe **FOUR** (4) methods of record keeping.
   i.  
   ii.  
   iii.  
   iv.  
   (4 marks)

c. Explain **FOUR** (4) **roles** of good record keeping in Farm Business.
   i.  
   ii.  
   iii.  
   iv.  
   (4 marks)
QUESTION EIGHT: AGRICULTURAL MARKETING (10 marks)

Study Graph 2 below and answer the questions that follow

Graph 2: Seasonal Prices of English Cabbage in Tongatapu Market 2012/2013

- a. Which month gave the cabbage growers the most return? 
  ____________________________________________________________________________  
  (1 mark)

- b. Which month gave cabbage growers the lowest price in returns? 
  ____________________________________________________________________________  
  (1 mark)

- c. Give TWO (2) reasons for the low prices in August.
  i.  ____________________________________________________________________________  
  ii. ____________________________________________________________________________  
  (2 marks)

- d. Explain what factors affected the supply of English Cabbage on the market.
  i.  ____________________________________________________________________________  
  ii. ____________________________________________________________________________  
  (2 marks)
With the intention to gain profit from growing English Cabbage in Tongatapu, discuss your action plan according to the following heading:

i. When to make seedbed and sow seeds?

______________________________________________________________________
______________________________________________________________________
(1 mark)

ii. When to transplant?

______________________________________________________________________
______________________________________________________________________
(1 mark)

iii. How to manipulate drought?

______________________________________________________________________
______________________________________________________________________
(1 mark)

iv. When to harvest?

______________________________________________________________________
______________________________________________________________________
(1 mark)
ANSWER SHEET

MULTIPLE CHOICE SECTION

Write the letter of your BEST Answer in the box below

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
<th>Marker</th>
<th>Check Marker</th>
</tr>
</thead>
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SECTION A
Multiple Choice

SECTION B
Marker Check Marker

QUESTION ONE
Agricultural System

QUESTION TWO
Soil

QUESTION THREE
Plant Production

QUESTION FOUR
Plant Protection

QUESTION FIVE
Animal Production

QUESTION SIX
Animal Protection

QUESTION SEVEN
Agricultural Management

QUESTION EIGHT
Agricultural Marketing

TOTAL

120