MARKER CODE				

Student Enrolment Number									

TONGA FORM SIX CERTIFICATES

2016

AGRICULTURAL STUDIES

QUESTION AND ANSWER BOOKLET

Time allowed: 3 Hours

INSTRUCTIONS

1. Write your **Student Enrolment Number (SEN)** on the top right-hand corner of this page.
2. Additional sheets of paper can be obtained from your supervisor if necessary. Write your **Student Enrolment Number (SEN)** on each addition sheet number the questions clearly and insert them in the appropriate part of your booklet and tie securely.

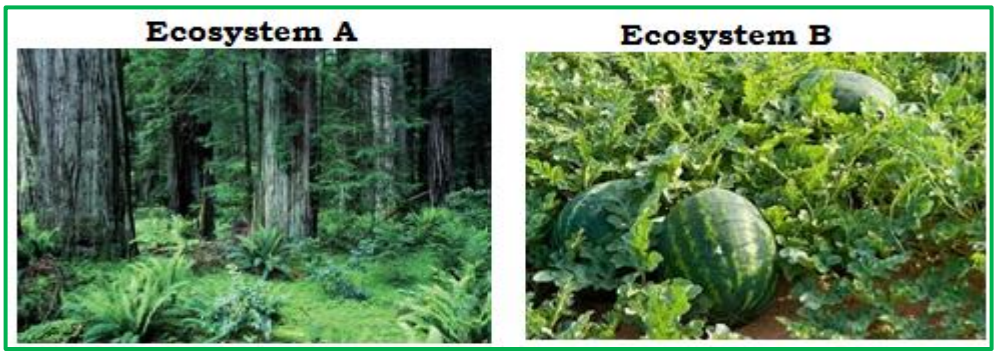
SECTION		Pages	Total Skill Level	Time
A	Agricultural Ecosystem and Environment	2-3	7	18
B	Soils	4-5	7	18
C	Farm Power and Agricultural Machinery	6-8	8	21
D	Crop Production and Crop Protection	9-12	18	46
E	Animal Production and Health	13-16	18	46
F	Agricultural Management and Marketing	17-19	12	31
		19	70	180

3. Check that this booklet contains pages 2-19 in the correct order and that none of the page is blank.

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

SECTION A Agricultural Ecosystem and Agricultural Environment. (7 Skill Level)

Study **Figure 1** and answer question 1 below.



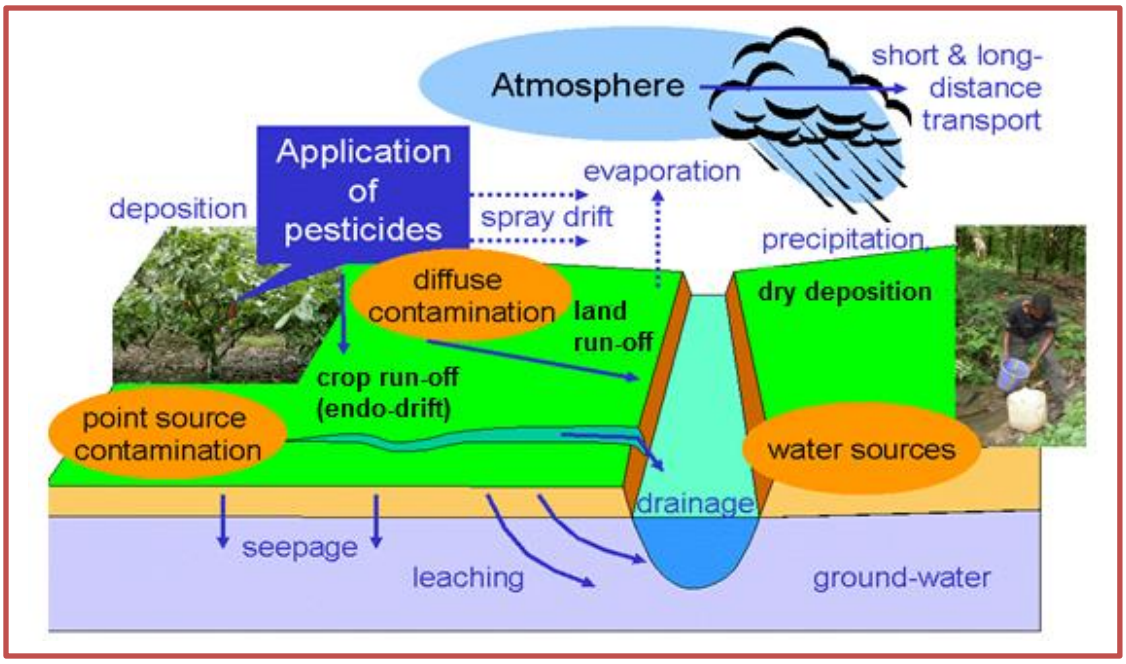
Skill level 1	
1	
0	
NR	

1. **Identify** Ecosystem **A** above.

_____

Use **Figure 2** below and answer the questions that follow.

Figure 2



Skill level 1	
1	
0	
NR	

2. Identify **ONE** (1) possible **hazard** (danger) of pesticides to the agricultural environment in **Figure 2** above.

_____

3. Describe **ONE** (1) necessary precaution to be taken to minimize contamination and pollution of farm chemicals.

Skill level 2	
2	
1	
0	
NR	

4. Explain the first aid procedure for dealing with pesticide poisoning.

Skill level 3	
3	
2	
1	
0	
NR	

SECTION B **SOILS** **(7 Skills Level)**

Study **Figure 3** below and answer the following questions.

Figure 3 : Water Erosion

1. Define soil Erosion.

Skill level 1	
1	
0	
NR	

2. Identify the type of **water erosion** shown in **Figure 3** above.

Skill level 1	
1	
0	
NR	

3. Describe **ONE** (1) method of controlling **water erosion** shown in **Figure 3** above.

Skill level 2	
2	
1	
0	
NR	

Study **Figure 4** below and answer the following question.

Figure 4: Liming the Soil.

4. **Explain** the impact of Liming on the **Nutrient status** of the soil in **Figure 4** above.

Skill level 3	
3	
2	
1	
0	
NR	

SECTION C FARM POWER AND AGRICULTURAL MACHINERY (8 Skills Level)

Study **Figure 5** below and answer the following question.

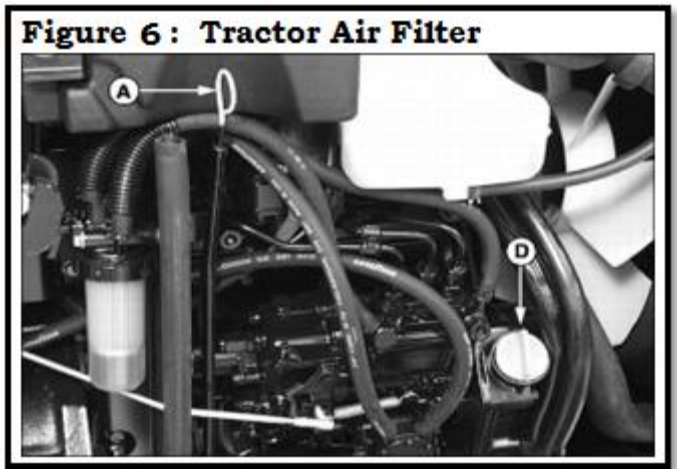
Figure 5 : Tractor drawn equipment

1. Observe the Tractor drawn equipment above in **Figure 5** and identify which one is the **Disc Plough.**

Skill level 1	
1	
0	
NR	

Study **Figure 6** below and answer the following question.

Figure 6 : Tractor Air Filter



2. Observe parts of the Tractor Engine labelled **A** and **D** and **identify** the part used for daily checking of Transmission oil.

Skill level 1	
1	
0	
NR	

Use the diagram of Tractor Air Filter given below to answer the following question.

Figure 7 Tractor Air Filter

Skill level 1	
1	
0	
NR	

3. **Identify** the **problem** that often occurs in Tractor **Air Filters**.

_____

4. **Describe** the **function** of Air Filters in Tractors.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Skill level 2	
2	
1	
0	
NR	

Study **Figure 8** and **9** below and answer the following question.

Figure 8 : Two - Stroke Engine

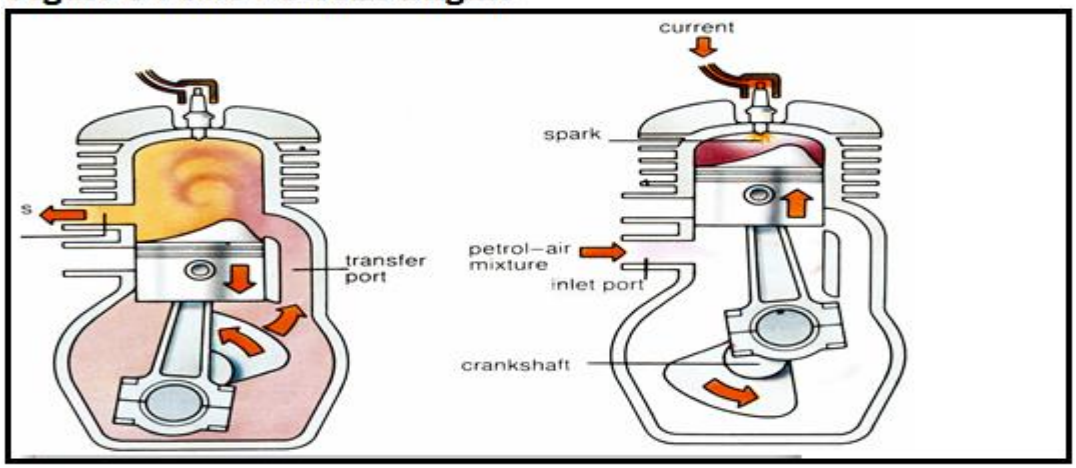
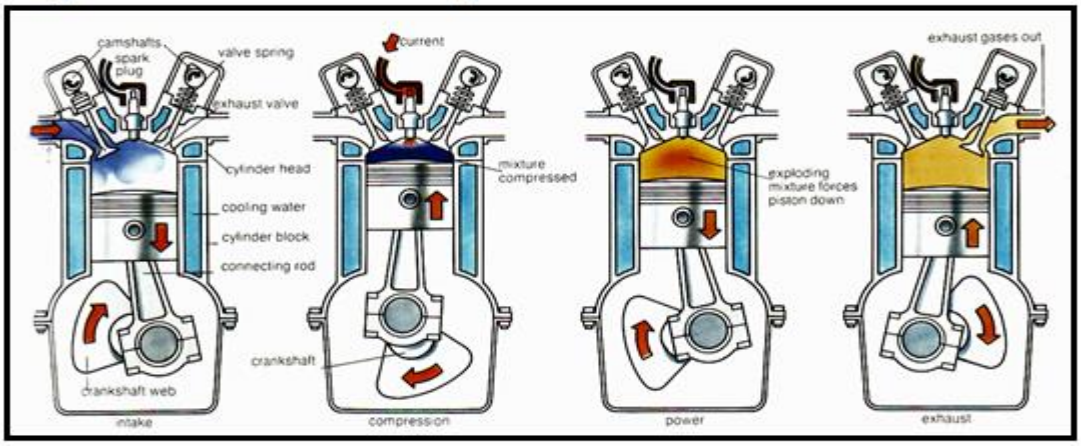


Figure 9 : Four - Stroke Engine



5. **Compare Two – Stroke** Engines to **Four – Stroke** Engines.

Skill level 3	
3	
2	
1	
0	
NR	

SECTION D Crop Production and Crop PROTECTION (18 Skills Level)

1. Study the Pest of Root Crops in **Table 1** below and **Fill in the Blank Spaces**.

Table 1 : Root Crop Pest

Pest A	Pest B
Name of Pest **i.** _____	**Name of Pest** **ii.** _____
Specific Pest of **iii.** _____	**Specific Pest of** **iv.** _____

Skill level 1	
1	
0	
NR	

Skill level 1	
1	
0	
NR	

Skill level 1	
1	
0	
NR	

Skill level 1	
1	
0	
NR	

2. Describe the damage caused by **Pest A** to the host plant.

_____

_____

_____

_____

_____

_____

_____

_____

Skill level 2	
2	
1	
0	
NR	

3. Describe a **cultural method** of controlling **Pest A** in page 9.

Skill level 2	
2	
1	
0	
NR	

4. Discuss the **economic impacts** of pests as barriers in trading with overseas markets**.**

Skill level 4	
4	
3	
2	
1	
0	
NR	

Fruit Crops may not be successful without the contribution of Honey Bees.

Figure 10 Bees Pollination

5. Explain **ONE** (1) farming practice, (exclude **Chemicals)** that is harmful to Honey Bees in Tonga.

Skill level 3	
3	
2	
1	
0	
NR	

Study **Figure 11** below and answer the following question.

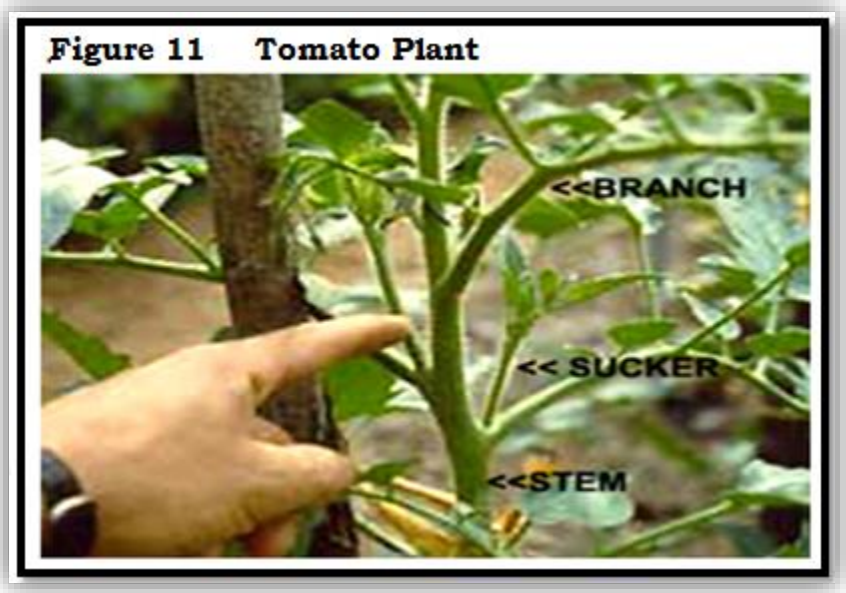


Figure 11 Tomato Plant

6. **Explain** how a farmer can manipulate **light density** in this tomato plant.

Skill level 3	
3	
2	
1	
0	
NR	

SECTION E ANIMAL PRODUCTION AND HEALTH (18 Skills Level)

1. Study breeds of cattle in **Table 2** below and fill in the blank spaces by identifying the name and production specialty of each breed.

Table 2 : Cattle Breeds

	Cow	Production
1.		A.
2.		B.
3.		C.

Skill level 1	
1	
0	
NR	

Skill level 1	
1	
0	
NR	

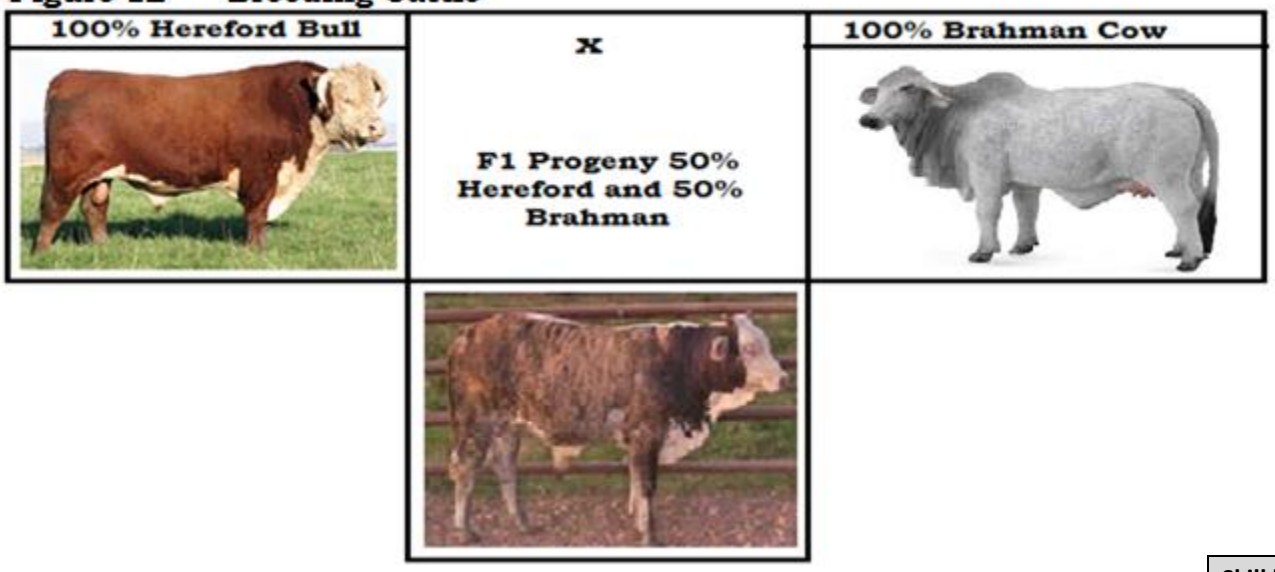
Skill level 1	
1	
0	
NR	

2. Cattle breeds above have different adaptations to tropical environment. Evaluate the ability of **Cow A** to adapt to tropical climate.

Skill level 4	
4	
3	
2	
1	
0	
NR	

Study **Figure 12** below and answer the questions that follow.

Figure 12 Breeding Cattle



3. Identify the breeding system observed in **Figure 12** above.

_____

Skill level 1	
1	
0	
NR	

4. Describe the **advantages** of this breeding system identified in (3. above).

_____
_____
_____
_____
_____
_____

Skill level 2	
2	
1	
0	
NR	

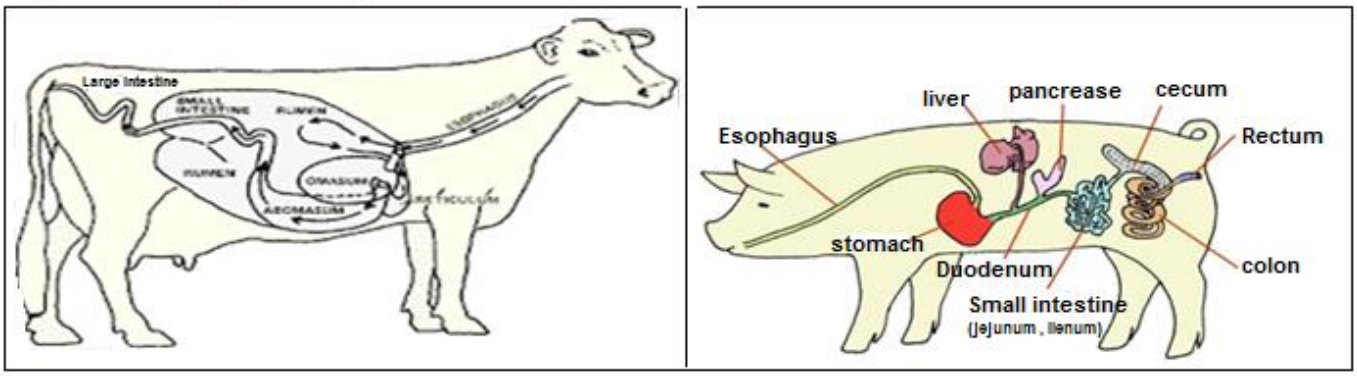
5. Describe **ONE** (1) factor affecting the **growth** of calf as shown above.

_____
_____
_____
_____
_____
_____

Skill level 2	
2	
1	
0	
NR	

Study **Figure 13** and answer question 6 below.

Figure 13 Digestive process in cow and sow



6. **Compare** the digestive system of **Ruminant animal** (Cow) and **Monogastric animal** (sow) in **Figure 13** above.

Skill level 3	
3	
2	
1	
0	
NR	

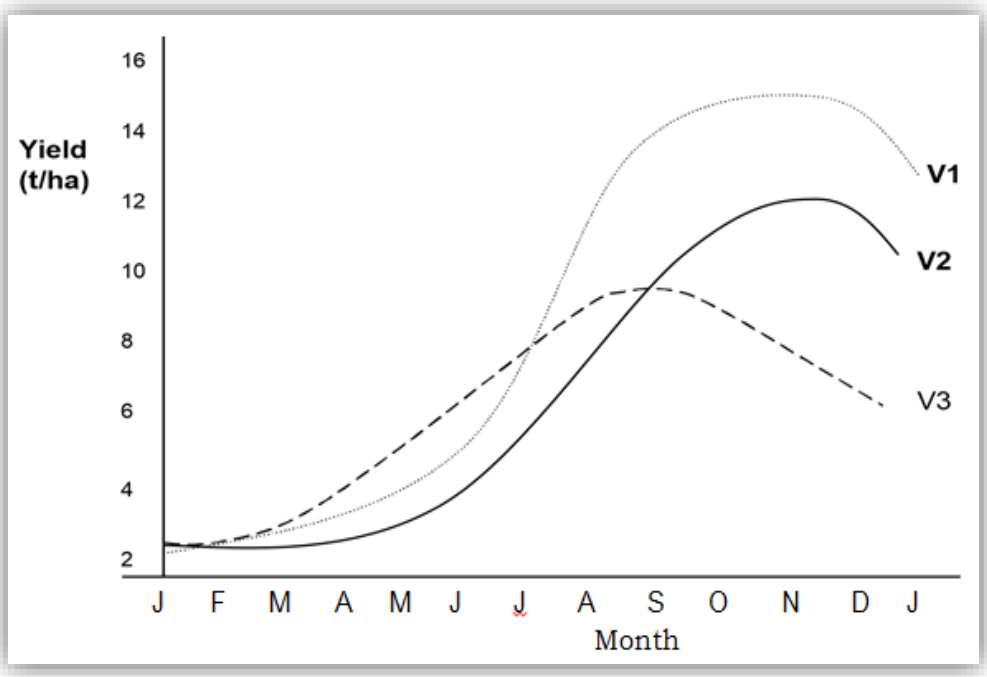
7. To help digestion in the rumen of ruminant animals such as cattle "**Chew the Cud**". **Explain** how "**chewing the cud**" helps digestion.

Skill level 3	
3	
2	
1	
0	
NR	

SECTION F AGRICULTURAL MANAGEMENT AND MARKETING (12 Skills)

Graph 1 shows the yield of three varieties of Taro in the Vaini Research Station as trial over a year.

Graph 1



KEY :
V1 - Variety 1
V2 - Variety 2
V3 - Variety 3

Use the information from the graph above to **recommend** the best variety of Taro to grow and market by Tongan farmers.

Skill level 1	
1	
0	
NR	

1. Recommended variety:

_____

2. Describe reasons for your choice:

_____

_____

_____

_____

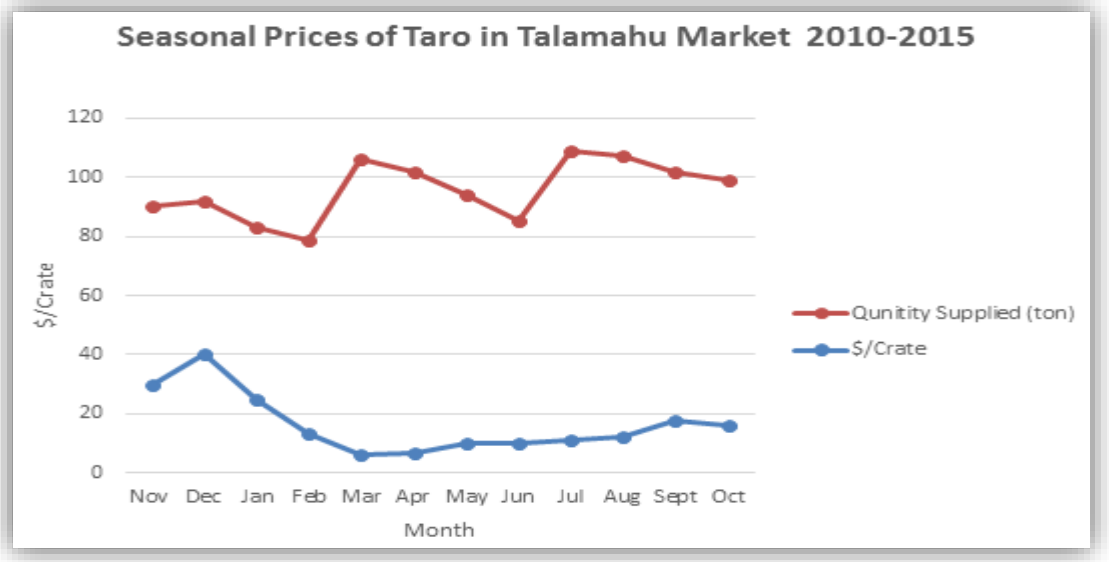
_____

_____

Skill level 2	
2	
1	
0	
NR	

Study **Graph 2** below and answer the question that follows.

Graph 2



1. With the intention to grow and gain more profit from farming Taro in Tonga. **Discuss** your plan to **maximize** your profit and consider the following:

- Cultivar (consider Taro in Graph 1 above).
- Harvesting

Skill level 4	
4	
3	
2	
1	
0	
NR	

Skill level 1	
1	
0	
NR	

2. Identify **ONE** (1) problem of selling Taro at Talamahu Market in the month of March.

_____

3. In order to attract taro buyers **explain** appropriate methods of preparing Taro products to meet the requirements of local consumers.

_____

_____

_____

_____

_____

_____

_____

Skill level 3	
3	
2	
1	
0	
NR	

Table 3 below shows the recording system of Tevita's Piggery farm. He decided to cull his unproductive sow to minimize his production costs.

Table 3

Sow number	Farrowing date	Litter number
Sow 1	23.05.16	12
Sow 2	20.05.16	10
Sow 3	18.05.16	9
Sow 4	16.05.16	5
Sow 5	10.05.16	9

Skill level 1	
1	
0	
NR	

4. Identify which sow should be **culled** from Tevita's Piggery farm.

_____