

MARKER CODE				



STUDENT ENROLMENT NUMBER (SEN)									

TONGA SCHOOL CERTIFICATE

2019

AGRICULTURAL SCIENCE

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. This paper consists of **SIX SECTIONS** and is out of 70 weighted score.

SECTIONS	TOPICS	TOTAL SKILL LEVEL
ONE	AGRO-FORESTRY	7
TWO	SOILS	13
THREE	AGRICULTURAL TOOLS	9
FOUR	CROP PRODUCTION AND PROTECTION	17
FIVE	ANIMAL PRODUCTION AND HEALTH	17
SIX	AGRICULTURAL INDUSTRY	7
	TOTAL	70

3. Answer ALL QUESTIONS. Write your answers in the spaces provided in this booklet.
4. Use a **BLUE** or **BLACK** ball point pen only for writing. Use a pencil for drawing if required.
5. If you need more spaces for answers, ask the supervisor for extra paper. Write your **Student Enrolment Number (SEN)** on each additional sheet, number the questions clearly and insert them in the appropriate places in this booklet.
6. Check that this booklet contains pages **2-19** in the correct order and that none of the pages is blank.

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

SECTION ONE:

AGRO-FORESTRY

Alley Cropping is an example of Agro-forestry as shown in Figure 1 below. Use it to answer questions 1 and 2.

Figure 1: Alley Cropping



Source: <http://www.flickr.com>

1. Define the term **Agro-forestry**.

Skill level 1	
1	
0	
NR	

2. Describe **ONE** (1) advantage of Alley Cropping.

Skill level 2	
2	
1	
0	
NR	

*Timber wood are sometimes grown on slope and terraces as shown in Figure 2 below.
Use it to answer questions 3 and 4.*

Figure 2: Timber Trees Grown On Slopes



Source: www.nps.gov

3. Define the term **timber trees**.

Skill level 1	
1	
0	
NR	

4. Explain **ONE** (1) advantage of growing forestry trees on slope areas.

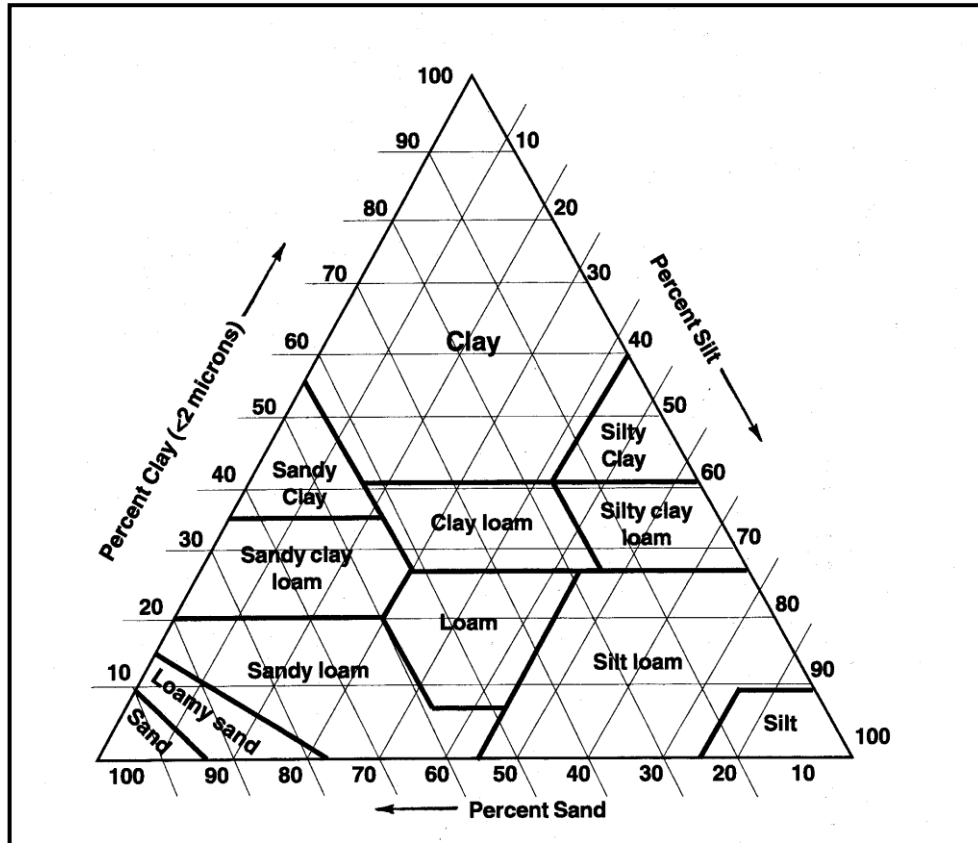
Skill level 3	
3	
2	
1	
0	
NR	

SECTION TWO:

SOILS

Figure 3 below shows a textural triangle. Use it to answer questions 1 and 2.

Figure 3: Textural Triangle



Source: Plant and Soil Science eLibrary

1. Define the term **Soil Texture**.

Skill level 1	
1	
0	
NR	

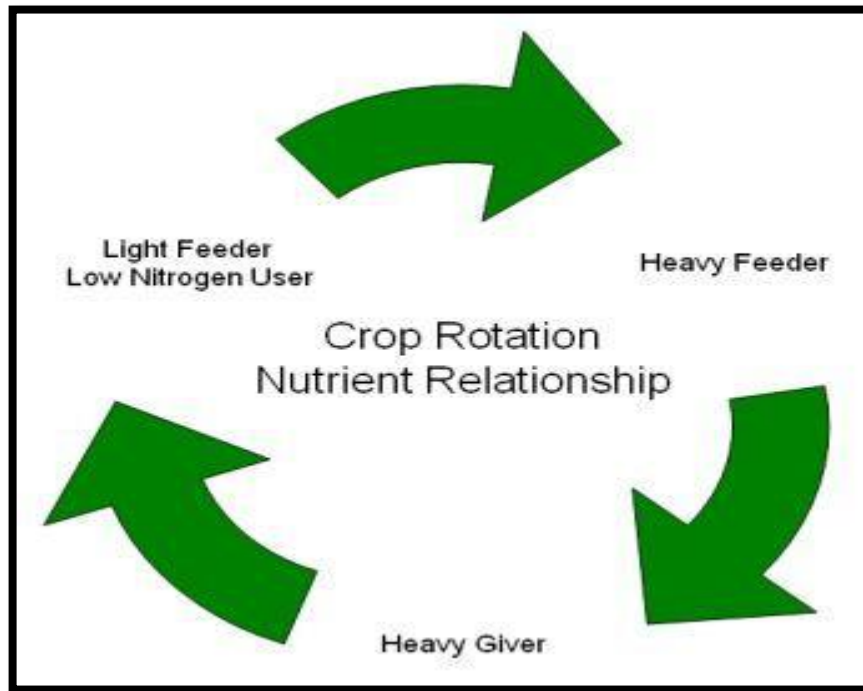
2. Relate the soil types that has the following percentage; Sand 30%, Clay 40%, Silt 30%, and then write your answer in the space given below.

(Show all workings, by connecting all the percentages given on the textural triangle above.)

Skill level 3	
3	
2	
1	
0	
NR	

Figure 4 below is a diagram of a Crop Rotation System. Use it to answer questions 3 and 4.

Figure 4: Crop Rotation System



Source: www.organicgardeninfo.com

3. Define the term **Crop Rotation**.

Skill level 1	
1	
0	
NR	

4. Describe **ONE** (1) importance of Crop Rotation.

Skill level 2	
2	
1	
0	
NR	

Figure 5 below is a picture of a poor farming practice. Use it to answer questions 5 and 6.

Figure 5: Poor Farming Practices



Source: Seasonal Climate Variability dependent effects of Conservation Agriculture

5. List **TWO** (2) Poor Farming Practices

- i. _____
- ii. _____

Skill level 2	
2	
1	
0	
NR	

6. Discuss **ONE** (1) negative effect of Mono-cropping on the nutrient status of the soil.

Skill level 4	
4	
3	
2	
1	
0	
NR	

SECTION THREE:

AGRICULTURAL TOOLS

Figure 6 below is a picture of a Knapsack Sprayer. Use it to answer questions 1 and 2. Parts C and D has been labelled.

Figure 6: Knapsack sprayer



Source: Amazon.com: Solo 4-Gallon Professional Piston Backpack Sprayer

1. Label the following parts as shown in the knapsack sprayer above.

a. A. _____

b. B. _____

Skill level 1		
	a.	b.
1		
0		
NR		

2. Describe the purpose of a knapsack sprayer.

Skill level 2	
2	
1	
0	
NR	

Study the diagram of Animal production tools in Figure 7 below and answer questions 3 and 4.

Figure 7: Animal Production Tool



Source: www.agri.wa.gov.au

3. Describe how to use the tool in **Figure 7** above.

Skill level 2	
2	
1	
0	
NR	

4. Explain the maintenance required for the tool shown in **Figure 7**.

Skill level 3	
3	
2	
1	
0	
NR	

SECTION FOUR: CROP PRODUCTION AND PROTECTION

Figure 8 below shows nutrient deficiency in crop plants. Use it to answer questions 1, 2 and 3.

Figure 8: Nutrient Deficiency In Maize



Source: www.grainsa.co.za

1. Identify the Nutrient that is deficient in the **Figure 8** above.

Skill level 1	
1	
0	
NR	

2. Describe **ONE** (1) importance of the Nutrient that is deficient in the picture above.

Skill level 2	
2	
1	
0	
NR	

3. Explain **ONE** (1) method that can be used to supply the nutrient that is deficient in **Figure 8** on page 9.

[illegible]

Skill level 3	
3	
2	
1	
0	
NR	

Figure 9 below is a picture of a head cabbage that has been affected by bacteria. Use it to answer questions 4, 5, 6 and 7.

Figure 9: Diseased Head Cabbage



Source: www.omfra.gov.on.ca

4. Define the term **Disease**.

Skill level 1	
1	
0	
NR	

5. Name the bacterial disease in **Figure 9** above.

Skill level 1	
1	
0	
NR	

6. Describe **ONE** (1) symptom of bacterial disease.

Skill level 2	
2	
1	
0	
NR	

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SECTION FIVE: ANIMAL PRODUCTION AND HEALTH

Figure 11 below shows a Friesian Cow. Use it to answer questions 1 and 2.

Figure 11: Friesian Cow



Source: www.roysfarm.com

1. Identify the country of origin of the Friesian Cow.

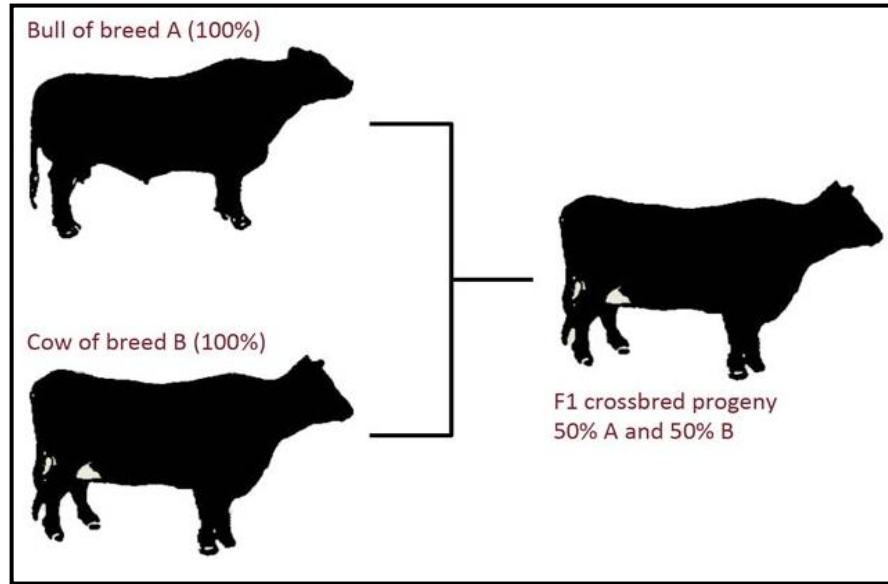
2. Describe **ONE** (1) productive attribute of the Friesian Cow.

Skill level 1	
1	
0	
NR	

Skill level 2	
2	
1	
0	
NR	

Figure 12 below is a diagram of a Cross Breeding program. Use it to answer questions 3 and 4.

Figure 12: Cross Breeding Program In Cattle Production



Source: www.futurebeef.com.au

3. Define the term **Cross-Breeding**.

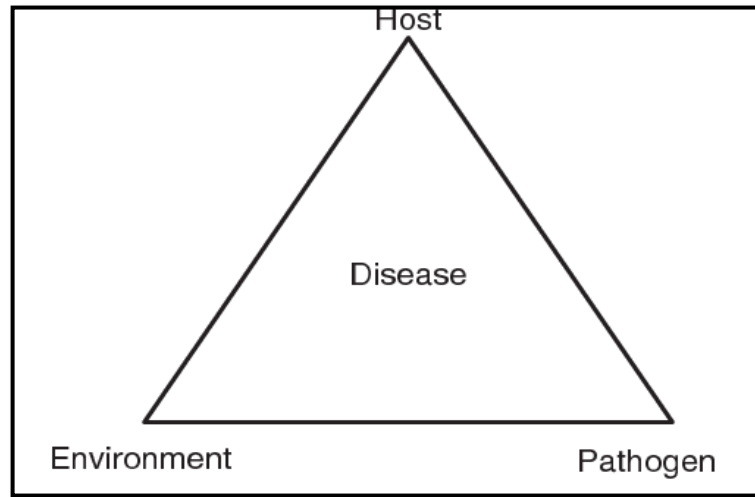
Skill level 1	
1	
0	
NR	

4. Explain a purpose of animal breeding in Livestock animals.

Skill level 3	
3	
2	
1	
0	
NR	

Figure 13 below is a diagram of the Etiology of Disease. Use it to answer questions 5 and 6.

Figure 13: Etiology Of Disease Triangle



Source: www.semanticscholar.org

5. Define the term **Host**.

Skill level 1	
1	
0	
NR	

6. Discuss the Etiology of the Disease Triangle.

Skill level 4	
4	
3	
2	
1	
0	
NR	

Figure 14 below shows how Brucellosis affects animal production. Use it to answer questions 7 and 8.

Figure 14: Cattle Affected With Brucellosis



Source: www.gadvasu.in

7. Describe **ONE** (1) clinical signs of Brucellosis.

Skill level 2	
2	
1	
0	
NR	

8. Explain **ONE** (1) treatment for Brucellosis.

Skill level 3	
3	
2	
1	
0	
NR	

SECTION SIX:

AGRICULTURAL INDUSTRY

Figure 15 below shows the post-harvest handling of tomatoes. Use it to answer questions 1, 2, 3 and 4.

Figure 15: Post Harvest Handling Of Tomatoes



Source: www.ag.purdue.edu

1. Define the term **Post-harvest**.

Skill level 1	
1	
0	
NR	

2. Identify **ONE** (1) stage of post-harvest and processing.

Skill level 1	
1	
0	
NR	

3. Describe **ONE** (1) appropriate harvesting method for tomatoes.

Skill level 2	
2	
1	
0	
NR	

4. Explain **ONE** (1) way of achieving quality control in agricultural products.

		Skill level 3
		3
		2
		1
		0
		NR