

MARKER CODE				



STUDENT ENROLMENT NUMBER (SEN)									

TONGA NATIONAL FORM SEVEN CERTIFICATE

2022

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 **THREE SECTIONS** and is out of 70 weighted scores.

SECTION	STRANDS	TOTAL SKILL LEVEL
ONE	PRIMARY PRODUCTION	21
TWO	SUSTAINABLE PRIMARY PRODUCTION	25
THREE	PRODUCTION MANAGEMENT	24
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 space 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 contain pages **2-19** in the correct order and that page 19 has been deliberately left blank.

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

SECTION ONE: PRIMARY PRODUCTION

Question One: What is produced

Use the photograph below to answer questions a) to c).

Figure 1: Primary Produce in Tonga

Vanilla



Yam



Source: S.Hala'api'api

For this question you can use **either** of the Primary Produce in **Figure 1** to answer a) to c).

Name of the chosen Product: _____

- a. Identify the consumer preference for a specific attribute of your chosen primary product.

- b. Describe the packing procedure for your chosen product above in a. with reference to a specific market opportunity.

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Skill level 2	
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c. Explain how the attribute of your chosen product vary, according to different cultivar.

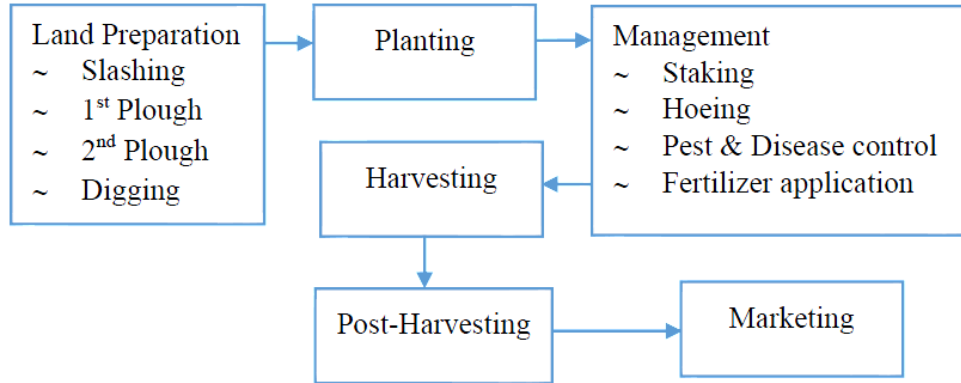
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Question Two: Factor Influencing Primary Production

Use the flow chart in **Figure 2** to answer questions a) to c).

Figure 2: Production process for yam



- a. Describe the effect of competition from import on the production of yam.

Skill level 2	
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- b. Explain how promotion helps in increasing the success of yam.

Skill level 3	
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c. Discuss how a substitute product affects the marketing of the yam.

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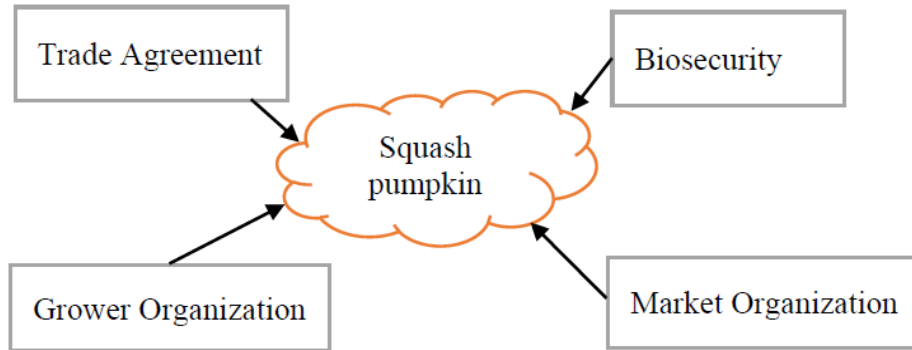
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Skill level 4	
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Question Three: Effect of Market Control

Use **Figure 3** to answer questions a) to c).

Figure 3: Market control for Squash pumpkin



- a. Define Market control.

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- b. Describe how a Grower organization manipulates the marketing of squash pumpkin.

Skill level 2	
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- c. Explain the role of any Trade Agreement on the marketing of squash pumpkin.

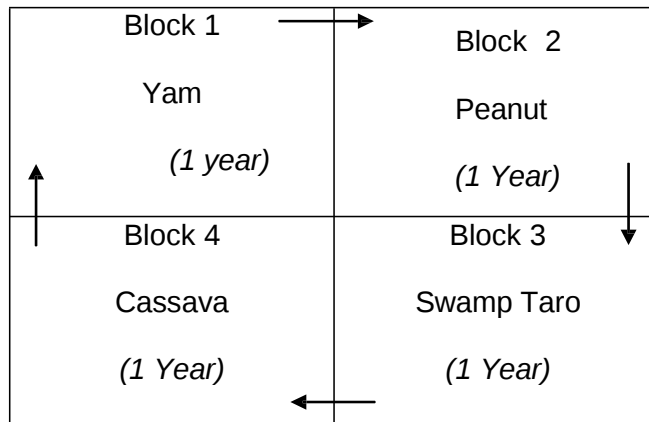
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SECTION TWO: SUSTAINABLE PRIMARY PRODUCTION

Question One: Analysing Production Practices

A farmer divided his land into 4 blocks and cultivated it with 4 different crops. After harvesting he rotates the crop as indicated by the arrow in the diagram.

Figure 4: Crop rotation



- a. Define sustainable agriculture.

- b. Explain the impact of the sustainable farming above on Public Health Safety.

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A farmer used the method of sustainable farming in **Figure 4** on his land for 15 years and the yield in each block declined to a state that no product can be obtained from Block 1 to Block 4. The extension officer in their district advised him to apply a soil enrichment practice in-order to improve the fertility of the soil.

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Skill level 2	
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- e. The extension officer also advised the farmer to avoid using weedicide to control weed but to remove the weed manually. Explain how removing weed manually contributes to sustainable farming.

[illegible]

Skill level 3	
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Question Two: Sustainable Agriculture Issue

Choose **ONE** (1) disease from the list below and use it to answer questions a) to c).

Figure 5: Issue in Animal Production

Tuberculosis (<i>cattle</i>)	Coccidiosis (<i>chicken</i>)
Brucellosis (<i>pig</i>)	Milk fever (<i>cattle</i>)
Mastitis (<i>cattle</i>)	Anemia (<i>pig</i>)

Name of your chosen Animal : _____

Chosen disease : _____

- a. Identify the importance of your chosen disease on the production of your selected animal.

Skill level 1	
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- b. Describe a way that you could use to control your chosen disease.

Skill level 2	
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c. Discuss a sustainable way of controlling your chosen disease.

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d. Apart from diseases, describe an issue that relates to sustainable farming.

[illegible]

Skill level 2	
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e. Explain the effect of **pestilence** in livestock production.

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SECTION THREE: PRODUCTION MANAGEMENT

Question One: Schedule of Operation

Choose a locally produced crop. Answer questions a) to c) using the crop you have chosen.

Name of crop: _____

- a. Identify the possible establishment times for your chosen crop to meet seasonal demand.

Skill level 1	
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- b. Choose **ONE** (1) management practice from the list below and describe how it is being carried out.

- i. Soil preparation
- ii. Fertility management
- iii. Pest control
- iv. Disease control

Chosen management practice: _____

Describe the proper way of doing this practice: _____

Skill level 2	
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- c. Relate the effectiveness of a biological manipulation on profit with regard to your chosen product.

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Question Two: Factor affecting Schedule of Operation, and Marketing Process

Choose **ONE** (1) local Primary Product from the list below and use this product to answer questions a) to e)

- i. Kava
- ii. Vanilla
- iii. Squash pumpkin
- iv. Poultry
- v. Beef
- vi. Sheep

Chosen Primary Product: _____

- a. Identify a specific factor that can influence a selected step in the schedule of operation for your chosen Primary Product.

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- b. List the appropriate inputs for each stages in the production process of your chosen Primary Product.

Skill level 2	
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Explain the production process for your chosen Primary Product.

Skill level 3	
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Relate the schedule of operations for your chosen Primary Product on achieving an optimum point of sale.

Skill level 3	
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Question Three: Manipulation of the schedule of operation

Use the information from the table to answer questions a) to c).

Sales and expenses of a squash farmer for 2018-2021

EXPENSES	2018	2019	2020	2021
Labour wages	\$3,500	\$3,600	\$3,700	\$4,800
Land lease	\$2,000	\$2,000	\$2,000	\$2,000
Fertilizer	\$1,000	\$1,500	\$1,800	\$4,000
Agrichemical	\$2,300	\$4,200	\$1,100	\$3,500
Loan payment	\$10,200	\$10,200	\$10,200	\$10,200
Fuel	\$500	\$600	\$500	\$600
Seed	\$1000	\$1000	\$1000	\$1000
TOTAL EXPENSES	\$20,500	\$23,100	\$20,300	\$26,100
SALES	\$220,000	\$222,000	\$221,000	\$223,000
Gross Margin				

- a. Use the concept of profit maximization to identify the year with the most profit.

Skill level 1	
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- b. List the possible market opportunity that this farmer can use for his squash pumpkin.

- i.

- ii.

Skill level 2	
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- c. Describe how a production manipulation can affect the profits of this farmer in the year **2019**. Study his expenses carefully so that manipulation can have an impact on the profit.

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