



STUDENT EDUCATION NUMBER									

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# Samoa National Junior Secondary Certificate

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## AGRICULTURAL SCIENCE

# 2022

### QUESTION and ANSWER BOOKLET

Time allowed: 3 Hours & 10 minutes

#### INSTRUCTIONS

1. You have 10 minutes to read **before** you start the exam.
2. Write your **Student Education Number (SEN)** in the space provided on the top right hand corner of this page.
3. **Answer ALL QUESTIONS.** Write your answers in the spaces provided in this booklet.
4. If you need more paper to write your answers, ask the Supervisor for extra paper. Write your SEN on all extra sheets used and clearly number the questions. Attach the extra sheets at the appropriate places in this booklet.

STRANDS		Pages	Time (min)	Weighting
<b>STRAND 1</b>	AGRICULTURE	2-3	14	8
<b>STRAND 2</b>	SOIL	4-5	18	10
<b>STRAND 3</b>	FARM MANAGEMENT, ECONOMICS AND MARKETING	6-9	36	20
<b>STRAND 4</b>	CROP PRODUCTION	10-13	43	24
<b>STRAND 5</b>	ANIMAL PRODUCTION	14-19	54	30
<b>STRAND 6</b>	TOOLS, EQUIPMENT AND FACILITIES	20-21	15	8
<b>TOTAL</b>			<b>180</b>	<b>100</b>

Check that this booklet contains pages 2-22 in the correct order and that none of these pages are blank.

**HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.**

For Questions 1 and 2, choose and write the LETTER of the correct answer in the box provided.

1. Identify the part of a plant or animal cell that **controls** the **variations** in plants and animals.

- A. Gene
- B. Membrane
- C. Cytoplasm
- D. Mitochondria

SL 1

2. The word **phenotype** refers to:

- A. the type of genes of a living thing.
- B. the way a living thing will look due to its genes.
- C. whether the animal or plant is a male or female.
- D. a flowering plant.

SL 1

3. Discuss how **Climate Change** can affect agriculture in Samoa.

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SL 2

4. Evaluate four reasons why agriculture is so **very important** to Samoa.

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SL 4

For Question 5, choose and write the LETTER of the correct answer in the box provided.

5. The term 'soil texture' means:

- A. the amount of air and water in a soil.
- B. the weight of rock minerals in a soil.
- C. the proportions of sand, silt and clay in a soil.
- D. the shape of the soil peds that make up a soil.

SL 1

6. Explain how a farmer can change the soil pH to make it less acidic for better growth of his crop plants.

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SL 2

7. Many living things such as insects, worms and microorganisms such as bacteria and fungi live in the soil. Explain how these help make the soil *fertile* for crops to grow in.

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SL 3



For Questions 9 to 10, choose and write the LETTER of the correct answer in the box provided.

9. Normally, the *main purpose* of *budgeting* for a farm is:

- A. to plan the use of resources such as land, labour, capital and technology in order to produce an agricultural product needed to meet cultural commitments.
- B. to provide employment for members of the farm household.
- C. To provide farm management training for members of the farm household.
- D. To plan the use of resources such as land, labour, capital and technology in order to produce an agricultural product that can be sold at the market in order to make a profit.

SL 1

10. What is a market?

- A. A place where friends meet.
- B. A place where you can catch the bus.
- C. A place where sellers and buyers of goods and services meet.
- D. A place where you can save money.

SL 1

Use the table below to answer Questions 11 to 13.

Given below is a table of the pork supply and demand with their associated prices. Study the table carefully then answer the questions.

Price (\$)	Pork Demand (kg)	Pork Supply (kg)
7	75	190
6	85	175
5	110	110
4	130	50
3	155	35
2	185	0

11. Explain the relationship between the **price** of pork and the **demand** for pork.

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SL 2

12. Explain the relationship between the **price** of pork and the **supply** of pork.

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SL 2

13. Identify the **equilibrium price** for pork in this market and explain the reason why it is the correct one.

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SL 2

14. When preparing agricultural products for the market, one of the processes that need to be carried out is **grading**. Explain what this is?

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SL 2

15. A farmer is thinking about substituting 1.0 hectare of taro for 1.0 hectare of bananas. In order to help in making a decision, the farmer began preparing a **partial budget** as given in the table below. The main items are the extra costs at \$40 for planting materials, additional revenue at \$3,000, costs avoided at \$300 for labour and revenue lost at \$2000.

Losses \$		Gains \$	
A. Extra cost	40	C. Cost avoided	300
B. Revenue lost	2000	D. Revenue gained	3000

Complete the table as appropriate and then based on that information:

- (a) Clearly state whether the farmer should adopt the plan;
- (b) Give the reason why.

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SL 3

16. Use the space below to design a livestock record sheet for a sow that has just given birth to piglets. The purpose of the sheet is to record the important information on the sow and piglets as they grow up for decision making purposes.

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SL 3



17. Assume that you are to undertake a market research on a crop product that is being sold at the market. Design a list of at least eight (8) items that you believe will form an important part of your research.

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SL 4

For Questions 18 and 20, choose and write the LETTER of the correct answer in the box provided.

18. There are several factors that help improve crop production. Sunlight is one of these factors. There are many uses of sunlight for crop growth but the most important is that:

- A. it increases the temperature of the soil.
- B. it increases the amount of air in the soil.
- C. it increases the amount of water in the soil.
- D. it provides energy for the crop plant to make its food.

SL 1

19. A management practice commonly used by local farmers which can be considered an appropriate organic farming method is the use of:

- A. the slash and burn method to clear lands for farming.
- B. the NPK fertilizer to improve soil fertility.
- C. the synthetic chemicals like paraquat to kill weeds.
- D. animal manure to improve soil fertility.

SL 1

20. The male organ of a flower is the:

- A. pistil.
- B. stamen.
- C. petal.
- D. sepal.

SL 1

21. Describe what happens in the process of pollination in a crop plant such as tomato.

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SL 2

22. Describe what happens in the process of fertilization in a crop plant such as cucumber.

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SL 2

23. Explain how legume plants are able to increase nitrogen in the soil making it more fertile for plant use.

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SL 2

24. Explain at least three different features of plant parts that are commonly used by Samoan people in their daily lives.

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SL 3

25. Nearly all crop plants are members of the class *Angiospermae* (flowering plants). Identify its two important sub-classes and give an example of each that is an important foodcrop here in Samoa.

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SL 3

26. Discuss how plants help promote life on earth for all living things including animals through what is known as the Nitrogen Cycle.

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SL 3

27. Discuss how plants are the key players in the Carbon Cycle that is working to reduce pollution and global warming in order to reduce the damage caused to the environment as a result of Climate Change.

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<b>SL 3</b>

28. Discuss how the process of plant growth can be made to work together with photosynthesis to produce high levels of crop production outputs.

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<b>SL 3</b>

For Questions 29 to 31, write the letter of the correct or best answer in the box provided.

29. The local pig breed used for pig farming in most Samoan households has the following advantage that other breeds do not have.

- A. It has a high rate of growth.
- B. It is highly affected by pests and diseases.
- C. It does not like local foods like taro.
- D. It is suited or adapted to the local climate.

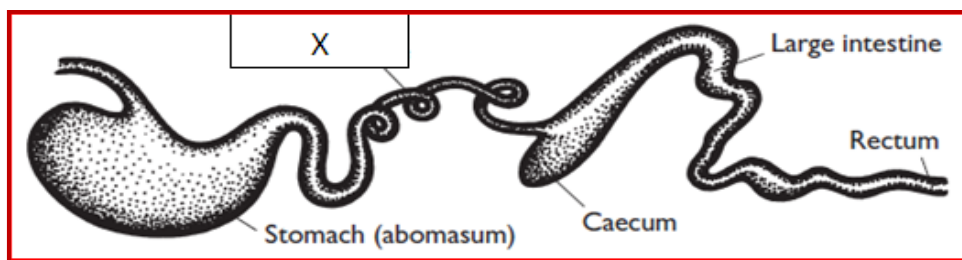
	SL 1

30. Identify an advantage of the intensive system of pig farming from the list below.

- A. The pigs will grow faster as they have more time to rest.
- B. It is much easier to carry out management tasks like ear tagging with the pigs held in pens.
- C. Money will be saved as pigs will not eat very much.
- D. Pigs will grow faster as they will not be able to move around so much.

	SL 1

**Figure 1 – Digestive system of pigs**



*Source: Wong, G. 2004. Agricultural Science Year 12, MESC.*

31. Study the diagram above which shows the digestive system of a pig then identify the part labeled X in the diagram from the list below.

- A. Liver
- B. Small intestine
- C. Gall bladder
- D. Kidney

	SL 1

32. Breeding is one way of improving the qualities of pig breeds needed for farming. Discuss at least two of these qualities.

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SL 2

33. A normal task or work in pig farming is to remove the eye teeth also called teeth clipping, of the young piglets, within the first 24 hours after the piglets are born. Explain the reason why this needs to be done.

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SL 2

34. Apart from air, **colostrum**, the first milk fluid that comes out of the sow's teats immediately after birth, is the most important substance a piglet takes in during the first few hours of its life. Explain why.

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SL 2

35. Explain the importance of pigs to a village community in Samoa in at least three different types of occasions.

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<b>SL 3</b>

36. Explain at least three types of pig categories or sizes and their usual markets in Samoa.

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<b>SL 3</b>



37. The pig has a **monogastric digestive system**. Explain what this system is about.

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<b>SL 3</b>

38. Explain the process to properly slaughter and dress a pig in a commercial pig farming operation so that it is fit for human consumption.

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<b>SL 4</b>

39. Describe how you would prepare a pig feed using local feed materials that would contain the essential food nutrients for a growing piglet that has been weaned from a sow.

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SL 4

40. Two diseases that affect pigs in Samoa are **Brucellosis** and **Coccidiosis**. Explain what these diseases are and the damages they cause to pigs.

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SL 4

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For Question 41, choose and write the letter of the correct or best answer in the box provided.

41. Why is it advised to cover tools in a film of oil if they are to be stored for a long time?

- A. To keep the tools new.
- B. To keep the tools shiny.
- C. To stop the tools from rusting.
- D. To keep the tools sharp.

SL 1

42. Write down one example each of a *measuring* and *cutting tool*, and then *identify the use* of each tool in farming activities.

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SL 2

43. Agricultural chemicals are poisonous to human and animal health. Identify what you believe are important *safety precautions* when handling these chemicals.

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SL 2

44. Describe the safest ways of storing **cutting** and **digging** tools.

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STUDENT EDUCATION NUMBER									

## AGRICULTURAL SCIENCE

2022

*(For Scorers only)*

STRANDS		Weighting	Scores	Check Scorer	AED Check
STRAND 1	AGRICULTURE	8			
STRAND 2	SOIL	10			
STRAND 3:	FARM MANAGEMENT, ECONOMIC AND MARKETING	20			
STRAND 4	CROP PRODUCTION	24			
STRAND 5	ANIMAL PRODUCTION	30			
STRAND 6	TOOLS, EQUIPMENT AND FACILITIES	8			
<b>TOTAL</b>		<b>100</b>			