



The University of Fiji
(An Entity of Arya Pratinidhi Sabha of Fiji)



SCHOOL OF SCIENCE AND TECHNOLOGY

Semester 1, 2026

FINAL EXAMINATION PAPER

AGE301 – AGRICULTURAL TECHNOLOGY

Important Instructions to Students:

1. Read the questions, instructions carefully in all eight (8) pages and answer the questions.
2. You are allowed an **extra 10-minute reading time** (during this time, you are not allowed to write with a pen) and **180 minutes (3 Hours) to complete this paper**.
3. Silent, non-programmable calculators are allowed but not supplied.
4. Write all your answers in the answer booklet provided. If you need extra sheets, please ask the supervisor. Write your name, course code, and student identification number in the answer booklet and in the attendance sheet.
5. This paper contains three (3) sections A, B and C. All questions are compulsory in section A and B. Choose any two questions from section C.
6. Write all your answers legibly. The marker has the right to award zero for answers that are not legible.
7. This is a **Closed Book Examination**. The University views plagiarism, cheating, and dishonest practice as serious offences, and if found, offenders are penalized.

Examination Paper Content (Format):

<u>Section</u>	<u>Question</u>	<u>Content</u>	<u>Marks</u>	<u>Suggested Time</u>
A	1-20	Multiple Choice	20	40 minutes
B	1-8	Short Answer Questions	40	70 minutes
C	1-3	Long Answer Questions	40	70 minutes
		TOTAL	100	180 Minutes

Registered with the Higher Education Commission as a University under the Higher Education Act, 2008.

Registration Certificate Number (RGN0020/11)

Section A: Multiple Choice Questions

(20 marks)

There are twenty (20) questions in this section, each worth 1 mark. **All questions are compulsory.** Write the question number and the selected answer beside it. You do not need to rewrite the questions in your answer booklet.

1. What is the primary goal of agricultural technology?
 - A) Increase crop yield.
 - B) Reduce labour costs.
 - C) Improve soil quality.
 - D) All the above.

2. Which of the following is a key component of precision farming?
 - A) Manual Labor.
 - B) GPS-guided machinery.
 - C) Traditional farming methods.
 - D) Crop rotation.

3. What is the primary purpose of technology transfer in agriculture?
 - A) To replace traditional farming with industrial methods.
 - B) To move innovations from research into practical use for societal benefit.
 - C) To increase government control over farming practices.
 - D) To reduce the number of farmers in rural areas.

4. Which is the latest technology being used for monitoring soil health in modern agriculture?
 - A) Drones.
 - B) Tractors.
 - C) Pesticides.
 - D) Irrigation systems.

5. Which crop has historically been the backbone of Fiji's agricultural economy?
 - A) Coconut.
 - B) Taro.
 - C) Sugarcane.
 - D) Cassava.

6. Which of the following is an example of a biological control method?
- A) Chemical pesticides.
 - B) Crop rotation.
 - C) Introducing natural predators.
 - D) Manual weeding.
7. What is the purpose of using cover crops in agriculture?
- A) Increase soil erosion.
 - B) Improve soil fertility.
 - C) Reduce water retention.
 - D) Increase pest population.
8. In the Triple Helix Model of innovation, which three entities collaborate to drive technology transfer?
- A) Farmers, NGOs, and cooperatives.
 - B) Universities, industries, and governments.
 - C) Researchers, students, and investors.
 - D) Donors, banks, and retailers.
9. What is the role of sensors in smart farming?
- A) Manual data collection.
 - B) Real-time monitoring.
 - C) Increasing labour requirements.
 - D) Reducing crop yield.
10. Which of the following is a key challenge in modern agriculture?
- A) High crop yield.
 - B) Climate change.
 - C) Abundant water supply.
 - D) Low labour costs.
11. What is the primary function of irrigation systems in agriculture?
- A) Pest control.
 - B) Water management.
 - C) Soil erosion.
 - D) Crop rotation.

12. Which of the following is a common method of soil conservation?
- A) Overgrazing.
 - B) Deforestation.
 - C) Terracing.
 - D) Monocropping.
13. What is the main advantage of using organic farming methods?
- A) Increased chemical use.
 - B) Improved soil health.
 - C) Reduced profit.
 - D) Reduced labour costs.
14. Which technology is used for precision planting in modern agriculture?
- A) Manual labour.
 - B) Automated planters.
 - C) Traditional ploughs.
 - D) Crop rotation.
15. What is the purpose of using drones in agriculture?
- A) Manual data collection.
 - B) Real-time monitoring.
 - C) Increasing labour requirements.
 - D) Reducing crop yield.
16. Which of the following is a benefit of using genetically modified crops?
- A) Increased pesticide use.
 - B) Improved crop resistance to pests.
 - C) Higher water consumption.
 - D) Reduced crop yield.
17. What is one major challenge facing crop extension services in Fiji?
- A) Overuse of digital tools.
 - B) Too many extension officers.
 - C) Communication barriers and limited resources.
 - D) Over-smart farmers.

18. Which of the following is a mechanism used by universities to share innovations with industry?
- A) Crop rotation.
 - B) Licensing agreements.
 - C) Fertilizer subsidies.
 - D) Traditional knowledge systems.
19. What is a key focus of Fiji's 2020–2030 Agriculture Strategic Plan?
- A) Reducing agricultural exports.
 - B) Promoting monoculture farming.
 - C) Building climate-resilient farming systems.
 - D) Eliminating organic farming practices.
20. What roles do Technology Transfer Offices (TTOs) play in universities?
- A) They manage crop production and irrigation.
 - B) They provide weather forecasts to farmers.
 - C) They handle patents, licensing, and partnerships for innovations.
 - D) They distribute fertilizers to rural communities.

SECTION B: Short Answer Questions**(40 marks)**

There are eight (8) questions in this section. Each question is worth 5 marks. **All questions are compulsory.** Write the question number and the selected answer beside it. You do not need to rewrite the questions in your answer booklet.

Question 1:

Compare and contrast the key drivers of agricultural transformation in developing versus developed countries. Provide specific examples to support your answer.

Question 2:

Describe the role of precision farming technologies such as GPS-guided machinery and drone monitoring in modern agriculture?

Question 3:

How has mechanization contributed to increased agricultural productivity? Provide specific examples.

Question 4:

What is the main difference between Smart Farming and Precision Farming?

Question 5:

Explain how climate change impacts the hydrological cycle and discuss why Pacific Island Countries and Territories (PICTs) are particularly vulnerable.

Question 6:

Explain the concept of smart sensing technology and its role in modern agriculture.

Question 7:

Explain the difference between Conventional and Modern biotechnology?

Question 8:

How do ICT tools (like SMS or social media) assist in the process of technology transfer to farmers?

SECTION C: Long Answer Question

(40 marks)

There are three (3) questions in this section. **Select any two questions.** Each question is worth 20 marks. Write the question number and the selected answer beside it. You do not need to rewrite the questions in your answer booklet.

Question 1:

Analyse the benefits and challenges of implementing precision agriculture in small-scale farming systems, particularly in the context of developing regions such as the Pacific Islands.

In your answer, you should:

- Define precision agriculture and explain its core technologies (e.g., GPS, sensors, drones, and data analytics).
- Discuss how these technologies can improve productivity, sustainability, and resource efficiency in smallholder farms.
- Critically evaluate the economic, technical, and social barriers in small-scale settings.
- Provide real or hypothetical examples to illustrate both successful and challenging implementations.
- Conclude with recommendations for how governments, NGOs, or the private sector can support the integration of precision agriculture in small-scale farming.

Question 2:

Critically assess the potential of nanotechnology in transforming agricultural practices in Small Island Developing States (SIDS).

Your answer should:

- Define nanotechnology and explain its key applications in agriculture (e.g., nano-fertilizers, nano-pesticides, and nano-sensors).
- Discuss how these innovations can address challenges such as limited arable land, climate change, and food security.
- Evaluate the risks, limitations, and ethical considerations of using nanotechnology in agriculture.
- Provide potential applications for this in the Pacific or other SIDS to illustrate your points.

Question 3:

Write a short report on the case study “Taro Leaf Blight in Samoa,” particularly in the context of biotechnology that has been used for crop improvement in the Pacific.

Your answer should include:

- Why Taro Leaf Blight was considered a problem and how it affected the taro industry in Samoa.
- How the problem was addressed amidst the crisis. What approaches and responses were outlined by different organizations?
- What was the outcome of different integrated approaches?
- What key lessons were learnt from this crisis?

THE END