



FIJI NATIONAL UNIVERSITY

COLLEGE OF AGRICULTURE, FISHERIES AND FORESTRY

SCHOOL OF AGRICULTURE SCIENCES & FORESTRY

DEPARTMENT OF SOIL SCIENCE & AGRICULTURAL ENGINEERING

Trade Diploma in Agriculture.

Final Examination

Semester 1 - 2019

SAC 521-Soil Fertility, Fertilizer and Agrochemicals.

Writing Time allowed: 3:00 hours
Total marks: 100.

Reading time: 10 minutes

This paper consists of seven (7) pages, please check to see that your paper is complete.

INSTRUCTIONS:

Answer all questions in the answer booklet

- Number your answers correctly in the provided answer booklet.
- Write your student ID number on all pages including additional sheets.
- Write your student ID number on question paper.
- Don't write answers on question paper; write answers only in answer booklet.

"MOBILE PHONES ARE STRICTLY PROHIBITED IN THE EXAMINATION HALL"

Sections	Guidelines	Total Marks
A	Part I: Multiple Choice Questions (20marks) Part II: True or False Question (10marks) Part III: Fill in the blanks (10 marks)	30
B	Short Answer Questions	30
C	Long Answers	40
Total marks		100

Section: A

Part I - Multiple Choices [10 marks]

IN THE ANSWER SHEET PROVIDED, CIRCLE THE LETTER, WHICH REPRESENTS THE BEST ANSWER TO THE QUESTIONS BELOW.

1. One of the main plant nutrient that needed for plant growth is:
 - a) copper
 - b) iron
 - c) manganese
 - d) none of the above
2. One factor that normally affect plant growth and development is:
 - a) plant genetics
 - b) water
 - c) light
 - d) all of the above
3. One type of composting is:
 - a) additions
 - b) translocation
 - c) transformation
 - d) none of the above.
4. One main classes of manures used in soil management is:
 - a) animal manure
 - b) compost manure
 - c) human manure
 - d) all of the above
5. One benefit of vermicomposting is:
 - a) decrease water holding capacity of soil.
 - b) enhances germination, plant growth, and crop yield.
 - c) does not improve root growth of plants.
 - d) does not improve physical structure of soil
6. In vermicomposting the nutrient content for nitrogen is:
 - a) 1.6%
 - b) 1.5%
 - c) 1.3%
 - d) 1.2%

7. One role of calcium in the plant growth is:
 - a) used in synthesis of calcium pectate in middle lamella of cell wall
 - b) involved in normal functioning of cell membrane
 - c) used in formation of mitotic spindle
 - d) all of the above.
8. One of the deficiency symptom of magnesium is:
 - a) chlorosis between the leaf veins
 - b) stunted growth
 - c) chlorosis, downward hooking and deformation in young leaves,
 - d) necrosis of young meristematic regions such as root tips or young leaves.
9. One role of Sulphur in the plant growth is:
 - a) additions
 - b) translocation
 - c) transpiration
 - d) none of the above.
10. One of the chemical properties of fertilizer is:
 - a) nitrogen
 - b) iron
 - c) boron
 - d) molybdenum

Part II

True or False

[10Marks]

Instructions:

In the “ANSWER BOOKLET” provided, write “TRUE” if the statement is correct and “FALSE” if the statement is incorrect.

1. Most plants will take up the majority of their nitrogen from soils in the form of nitrate.
2. Copper uptake decreases as soil pH increases.
3. Increased phosphorus and iron availability in soils decreases copper uptake by plants.
4. A fertile soil is the basis for healthy plants.
5. Adding less fresh organic matter, can overstimulated soil microorganisms.
6. Farm yard manure is the undecomposed mixture of dung and urine of farm animals along with litter and left over material from roughages or fodder fed to the cattle.
7. FYM contains 0.5%N, 0.2% P₂O₅ and 0.5% K₂O.
8. You can have better drainage by loosening soil structure.
9. Most of the crop plants prefer nitrogen in nitrate form.
10. One of the nitrogen deficiency symptom is poor growth and yellow color.

Instructions:

In the “ANSWER BOOKLET” provided, fill in the blanks.

1. The organic fraction in soils, is often called soil _____ matter.
2. Soil organic matter consists of plant and _____ residues.
3. Good seedbed preparation improves _____ and reduces the chance for diseases.
4. A delay in planting date often affects _____ negatively.
5. Plant more _____ than required for optimal plant density.
6. _____ compete with crops for nutrients, water and light.
7. Use viable seed ,at least ____% germination.
8. _____ weeding reduces the crop response to fertilizer.
9. Soil disturbance is minimized by reduced or _____ tillage.
10. Organic resources are bulky and their management is _____ intensive.

Section B**Short Answers****(30 marks)**

This section consists of FORTY MARKS short answer questions.

Instructions:

Attempt ALL questions in this section.

Write your answers in the Answer Booklets provided

1. What is the major source of plant nutrient? (1 mark)
2. Differentiate between the following :(2marks)
 - a) Plant growth
 - b) Plant development
3. Differentiate the following: (2marks)
 - a) Bulk organic manure
 - b) Concentrated organic manure
4. In composting lists the five main areas that must be “controlled” during composting? (3marks)
5. Name the two methods of vermicomposting? (2marks)
6. Name the three major fertilizer classifications? (2marks)
7. Briefly explain what is bio fertilizer? (1mark)
8. Give five (5) benefits of bio fertilizer? (5marks)
9. Differentiate between soil porosity and soil pore space. (2marks)
10. Explain what is auxin in the plant hormones? (1 mark)
11. Briefly explain what plant growth hormones is. (2marks)
12. Name the major five (5) classes of plant growth regulators. (3 marks)
13. Explain the difference between plant growth promoters and plant growth inhibitors. (2 marks)
14. Briefly explain what is agrochemicals? (1mark)
15. Explain what is pesticides? (1 mark)

Long answers type of questions.**Instruction:**

1. **ALL QUESTIONS ARE COMPULSORY**
2. Write your answers in the “**Answer Booklet**” provided
3. **Start each question on a NEW page of your Answer Booklet.**

QUESTION 1 – (10 marks)

- a) Briefly explain what is plant growth regulator? (3 marks)
- b) Lists the five (5) main classes of growth regulators. (2 marks)
- c) Briefly explain all the five classes of plant growth regulators functions? (5 marks)

QUESTION 2 - (10 marks).

- a) Explain the difference between, soil fertility and soil organic matter. (3marks)
- b) Give five (5) benefits of soil organic matter. (3 marks)
- c) Briefly explain the Criteria of Essentiality of Nutrients Elements. (4 marks)

QUESTION 3 – (10 marks).

Briefly explain the purposes of using the following agrochemicals: (10 marks)

- | | |
|-----------------|------------------|
| a) Insecticides | f) Molluscicides |
| b) Herbicides | g) Nematicides |
| c) Fungicides | |
| d) Algacides | |
| e) Rodenticides | |

QUESTION 4 -(10 marks).

Although agrochemicals are initially used to improve crop's health, overuse of these chemicals has now started affecting the environment in many ways. Give only two effects of agrochemicals on the following: (10 marks)

- a) Soil
- b) Water
- c) Air
- d) Human health

END OF EXAMINATION PAPER