

COLLEGE OF AGRICULTURE, FISHERIES & FORESTRY

Bachelor of Science in Agriculture Year 1: Trimester III Examination, 2017

PPA 501: Principles of Plant Pathology

Allocated Time: 3 hours and 10 Minutes (Reading Time)

Allocated Marks: 60

Instructions:

1. This paper is consist of four sections. All Sections are **compulsory**. Take Note of the Option given in Section D.
2. Ensure to write your names and ID Number on each sheet of paper of the answer sheet.
3. No written or printed materials are allowed into the examination room.
4. No mobile phone and other electronic device is allowed into the examination room.
5. You need to provide your own writing materials for the examination.
6. Write all your answers in the Answer sheet provided.

The table below shows the breakdown of the assessment paper and allocated time and marks.

Section	Section Description	Suggested Time	Allocated Marks
A	Multiple Choices	20 Minutes	10
B	Matching	20 Minutes	10
C	True or False	15 Minutes	10
D	Fill in the Blanks	20 Minutes	10
E	Short Answer Questions	60 Minutes	40
F	Essay Questions	45 minutes	20

**Section A: Multiple Choice Questions**

**(10 Marks)**

1. Ooze Test is a practice used in the laboratory for detection of -:
  - a. Virus
  - b. Bacteria
  - c. Fungus
  - d. Nematodes
  
2. Majority of plant diseases are caused by:
  - a. Bacteria
  - b. Virus
  - c. Fungus
  - d. Nematode
  
3. Koch Postulates is a technique used by plant pathologist to :
  - a. Detect the presence of Virus
  - b. Detect the presence of Nematodes
  - c. Detect the presence of Chlorophyll
  - d. Detect the presence of Fungus
  
4. A disease caused by environmental factors is also known as-:
  - a. Non-Communicable
  - b. Epidemic
  - c. Non-Infectious
  - d. Infectious
  
5. A common disease of seedlings
  - a. Downey Mildew
  - b. Damping Off
  - c. Powdery Mildew
  - d. Root rot
  
6. An example of a biotic factor of a disease is -:
  - a. Temperature
  - b. Morning Dew
  - c. Moisture
  - d. Virus
  
7. A control measure which involves the application of fungicides to control fungal growth on seedlings is an example of?
  - a. Exclusion
  - b. Eradication
  - c. Avoidance
  - d. Biological

8. Coffee rust is usually caused by -:

- a. *Hemileia vastatrix*
- b. *Phytophthora infestants*
- c. *Claviceps purpurea*
- d. *Hemileia infestants*

9. Plant pathogens usually act in the presence of

- a. Host and environment
- b. Water and soil
- c. Environment and human
- d. Human and soil

10. An example of an imperfect fungi -:

- a. Mushroom
- b. Penicillium
- c. Flask fungi
- d. Pin Mold

**SECTION B:**

**Matching**

**(10 marks)**

Match the following term in the table below to their correct description on the right.

1	<i>Ipomoea Batatas</i>	Fungal growth structure A
2	Stylet	Way of establishment of parasitic plants B
3	Eradication	Rhizobium on legume plant nodules C
4	Zoospore	Natural opening D
5	Primary inoculum	Feeding structure of nematode E
6	Direct penetration	Development of disease F
7	Symbiosis	Slime Moulds G
8	Myxomycota	Sweet Potato H
9	<i>Cucumis pepo</i>	A method of Integrated Disease management I
10	Lenticels	Pumpkin J

**SECTION C: True OR False. Write 'T' for True or 'F' for False if you think that the statement given is not correct. (10 marks)**

1. The word pathology is derived from the Greek words "pathos" meaning suffering and "logus" meaning study. \_\_\_\_\_
2. Ascomycota are classified as lower fungi which lacks 'Septa'. \_\_\_\_\_
3. Fungi reproduction can be through sexual and asexual means. \_\_\_\_\_
4. Streaking is a method used to break the colony of fungi. \_\_\_\_\_
5. Tabtoxin is a substance produced by *Pseudomonas syringae* pv. *Tabaci*. \_\_\_\_\_
6. Tobacco Mosaic Virus can spread through mechanical contact. \_\_\_\_\_
7. Fiji Disease is a common viral disease that is largely spread by aphids. \_\_\_\_\_
8. Ecto parasitic nematodes usually feed outside the root. \_\_\_\_\_
9. Nematodes usually reproduced through asexual reproduction. \_\_\_\_\_
10. A response to chemical concentration gradients is known as Chemotaxis. \_\_\_\_\_

**SECTION D: Fill in the Blanks**

**(10 Marks)**

Select the correct answer from the given words for each statement below.

Ascomycota	<i>Peronospora parasitica</i>	Dieback
Premature senescence	<i>Fusarium spp</i>	
<i>Mycosphaerella musae</i>	Basidiomycota	
<i>Phytophthora cinnamon</i>	Anthracnose	
<i>Aspergillus spp.</i>	Blackleg	

1. A major group of fungi that usually produced a specialized cell known as 'Ascus' is known as \_\_\_\_\_.
2. \_\_\_\_\_ Causes leaf speckle in banana.
3. \_\_\_\_\_ caused Fruitrot in Mango.
4. Dieback in Avacado is caused by. \_\_\_\_\_
5. Downey mildew of brassicas is caused by. \_\_\_\_\_
6. Rot in rock melon is usually caused by \_\_\_\_\_.
7. A disease which is characterized by Dark, sunken, necrotic spots or patches e.g. caused by *Colletotrichum* species is known as \_\_\_\_\_.
8. A common disease which results in necrotic of stem tissues causing a darkening and rotting of stem bases is known as \_\_\_\_\_.
9. Necrosis of stems and young twigs which affects the youngest tissues first and progresses down the stem is known as \_\_\_\_\_.
10. A common above ground symptom of a nematode attack is \_\_\_\_\_.

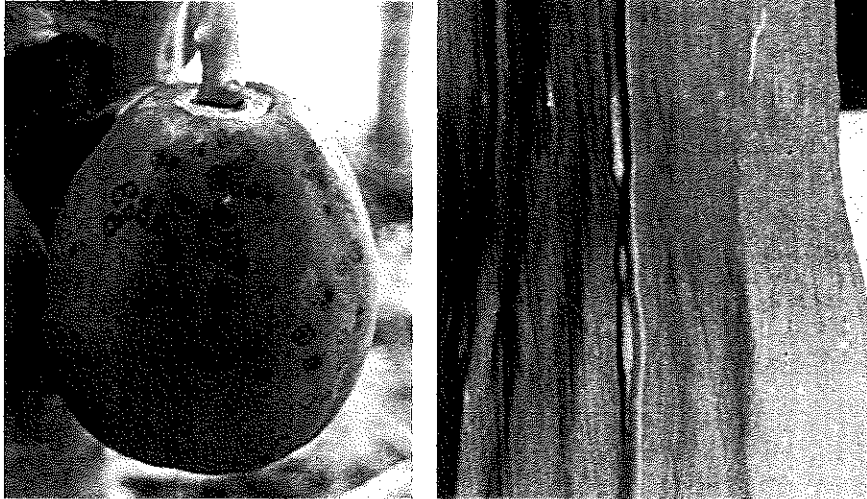
## SECTION C

### Short Answer Questions

(40 Marks)

1. Define the following terms: (5 marks)
  - a. Perception
  - b. Pathogenesis
  - c. Pathogen
  - d. Resistance
  - e. Virulence.
2. Differentiate between **Anemochory** and **Hydrochory**. (2 marks)
3. List and explain 2 methods of integrated disease management commonly practiced in Fiji. (4 marks)

4. State 4 root functions that will be affected by nematode infestation. (2 marks)
5. Refer to the diagrams below to answer question 5. (4 marks)



Based on the diagrams above, state **the name of the disease** and its **causal agent**.

6. Briefly explain a common bacterial test that can be used in the laboratory. (2 mark)
7. Explain why plant quarantine regulations plays a major role on disease infestation in the country with given examples. (2 marks)
8. Name 5 glassware that is found in the laboratory with their specific functions. (5 marks)
9. Briefly explain the function of a laminar airflow and Autoclave in a plant pathology laboratory. ( 2 marks)
10. With the aid of the diagram, draw the structure of the fungi penetrating the host plant cell. (2 marks)
11. Name any common disease of crops caused by bacteria, virus and fungi. (3 mark)
12. List three ways viral disease can be spread. ( 1 ½ marks)
13. List three major classes of fungi. ( 1 ½ marks)
14. Briefly explain the difference between **Ectoparasitic** nematode and **Endoparasitic nematode** with examples. (4 marks)

**SECTION D: Essay Questions**

**(20 Marks)**

Select and **two** topics from the following topics and write an essay of 500-800 words.

1. Explain the procedures of **Koch Postulate** carried out in the laboratory from extraction of disease specimen to pure culture extraction. **(10 marks)**

or

2. Explain the 5 stages of disease development and 5 ways pathogens can be dispersed from the infected plant to uninfected areas. **(10 marks)**

or

3. Explain how an inoculum enters a host plant and establishes itself. Focus on the following areas. **Dissemination of the inoculum, Germination, Penetration, establishment and incubation period. (10 marks)**

or

4. Explain the **five principles** of integrated disease management (IDM) that can be carried out to control the spread of diseases. **(10 marks)**

**The End**

