



PAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF HEALTH, APPLIED SCIENCES AND NATURAL RESOURCES

DEPARTMENT OF AGRICULTURE AND NATURAL RESOURCES SCIENCES

QUALIFICATION : BACHELOR OF SCIENCE IN HORTICULTURE	
QUALIFICATION CODE: 07BHOR	LEVEL: 6
COURSE: PLANT PROTECTION	COURSE CODE: PPN610S
DATE: JULY 2022	SESSION: JULY
DURATION: 3 HOURS	MARKS: 100

SECOND OPPORTUNITY EXAMINATION QUESTION PAPER

EXAMINER: Dr N. Muzhinji

MODERATOR: Dr E. Mowa

**THIS EXAMINATION PAPER CONSISTS OF FOUR (4) PAGES
(INCLUDING THIS FRONT PAGE)**

INSTRUCTIONS

1. All examination **RULES** apply
2. Read all the questions carefully before answering
3. Marks are indicated at the end of each question
4. Write clearly and neatly
5. All written work **MUST** be done in **BLUE** or **BLACK** ink

Section A: Multiple choice questions (8 marks)

1. Any cultivation will damage the crop to some extent and should be avoided when the crop is wet. Which group of pathogen (s) will be spread most readily if a crop is cultivated under wet conditions?
 - A. Bacteria
 - B. Viruses
 - C. Fungi
 - D. Nematodes

2. Which of the following pieces of information is not usually found on a pesticide label?
 - A. Active ingredient
 - B. Product name
 - C. Cost
 - D. Directions for use

3. Which of the following is not a feature of annual weeds?
 - A. Rapid growth
 - B. Short life cycle
 - C. High seed output
 - D. They have storage organs

4. Which choice would be an example of a biological method of pest control?
 - A. Applying a pre-emergence herbicide
 - B. Cultivating between rows
 - C. Crop rotation
 - D. Increasing the population of the pest's natural enemy

5. What are the stages of complete metamorphosis in insects?
 - A. Eggs, larva, pupa, adult
 - B. Eggs, nymph, adult, larva
 - C. Pupa, nymph, adult, moth
 - D. Eggs, Pupa, adult, Larva

6. A weed with a long narrow leaf, parallel veins; round hollow stem and leaves are aligned up and down the stem in two rows is called
 - A. Broadleaves
 - B. Grass
 - C. Sedges
 - D. Herbaceous

7. Which of the following is a plant disease that tends to produce only one infection cycle per host cycle?
- A. Soil-borne disease
 - B. Foliar diseases caused by fungi
 - C. Fruit diseases
 - D. Stem diseases
8. Which of the following is not a biotic cause of diseases
- A. Bacteria
 - B. Insects
 - C. Nematodes
 - D. Nitrogen deficiency

Section B: Answer all questions (92 MARKS)

1. Define or explain the following terms used in plant protection with examples.
- i. Sign [2]
 - ii. Pathogen [2]
 - iii. Annual weed [2]
 - iv. Systematic insecticide [2]
 - v. Post-emergence herbicide application [2]
2. a. Explain the difference between disease severity and disease incidence [2]
 b. Show how you will calculate disease incidence [2]
3. Briefly, explain the impact of plant pests to the horticultural sector in Namibia. [5]
4. Differentiate between quantitative and qualitative yield losses caused by crop pests. Give examples [4]
5. List six (6) major factors to consider when planning an integrated insect control program [6]
6. In January 2022, Etunda Green Scheme Irrigation, located in Ruacanaa started to see an increase in the number of tomato plants with stunted growth followed by wilting. Laboratory diagnosis of the plants identified root-knot nematodes (RKN) as the cause of this disease. Suppose you are the farm supervisor at the Etunda Green Scheme Irrigation responsible for ensuring good crop production of horticultural crops,
- a. List three (3) factors that must be present for the disease (wilting) to occur [3]
 - b. Describe the disease pentahedron and how it can be targeted to control root-knot nematodes on tomato crops [8]
 - c. Explain the difference between sedentary and migratory nematodes with examples? [2]

- 7.a) Describe the difference between epidemic and pandemic diseases giving examples of each [4]
- b.) Explain the four (4) host factors that affect disease epidemics [8]
8. Describe how weeds are classified according to life cycle; giving an example of each class. [8]
9. Write brief notes to the beneficiaries of Mashare irrigation scheme explaining why it is necessary to remove weeds and volunteer plants promptly from their fields. [4]
10. Design an Integrated Weed Management (IWM) strategy for controlling broadleaf weeds on irrigated cabbages [8]
11. What is the difference between monocyclic and polycyclic disease cycles? Giving examples [4]
12. Tomato crop in the greenhouse in Mariental has been infected with leaf and fruit spot disease. The disease reduced the growth of the tomato plants and rendered the fruits unmarketable. As a horticulturalist responsible for that region, you are tasked to investigate the actual cause of the disease. The symptoms appear like those caused by viruses/bacteria/fungi and you are not sure of the causative agent. You then decide to take the plant to a plant diagnostic laboratory in Windhoek for testing.
- a. Describe the nature of the sample that you would submit for testing and any other accompanying information that will assist in accurate identification of the disease/pathogen [5]
- b. Imagine yourself as part of a diagnostic team in the laboratory, detail all the steps that you would take to identify the cause of the problem correctly and accurately. [6]
13. Explain some of the causes of insect outbreaks in a crop field. [3]