



FIJI NATIONAL UNIVERSITY
College of Agriculture, Fisheries & Forestry
School of Agriculture and Forestry
Department of Entomology and Plant Pathology
Certificate III in Commercial Agriculture– Year 1
Final Examination
Semester 1 - 2019
CPP 311- Climate Change and Plant Protection

Writing Time: 3:00 hours

Reading Time: extra 10 minutes allowed at the beginning of the exam

Total Marks: 100

INSTRUCTIONS:

1. This paper consists of nine pages.
2. Please check to see that all your paper is complete.
3. Answer all questions in the Answer Booklet only.
4. No written or printed material and mobile phones are allowed in the examination hall.
5. Marks allocated for each section appears at the side of each question so allocate your time accordingly.
6. This paper is divided into Five Section

Section A: Multiple Choice	(20 Marks)
Section B: True or False	(10 Marks)
Section C: Matching	(10 Marks)
Section D: Short answer	(40 Marks)
Section E: Essay	(20 Marks)

Section A: Multiple Choice

(20 Marks)

1. Arthropoda is the largest Phylum under the animal Kingdom. Which of the following is not an arthropoda?
 - a) Mite
 - b) Scorpion
 - c) Millipedes
 - d) Snail

2. Insects is the largest group of organism under arthropoda and are characterized by the following characteristics;
 - a) 1 antenna, 3 pair of compound eyes, 3 pair of legs, 2 pair of wings and 3 pair of body parts
 - b) 1-2 pair of antenna, 2 pair of compound eyes, and 3 pair of legs, 1 pair of wings and have segmented body parts.
 - c) 0-3 pair of antenna, 1 pair of compound eyes, 6 pairs of legs, 4 wings and have 3 major body parts.
 - d) 1 pair of antenna, 2 compound eyes, 3 pair of legs, 1-2 pair of wings, 3 major body parts.

3. The 3 major body parts of an Insect are known as the;
 - a) Head , Cephalothorax and Abdomen
 - b) Head, Thorax and Abdomen
 - c) Head, Mid-body and Tail
 - d) Antennae, Mid- body and Tail.

4. Taro leaf blight is a major **disease of taro**, caused by the fungus _____
 - a) *Phytophthora colocasiae*
 - b) *Cucumber mosaic virus*
 - c) *Meloidogyne incognita*
 - d) *Anthracnose spp*

5. A plant with root-knot shows **poor growth**; they are **typically stunted** with **yellowing leaves**, and **wilt easily**. **This disease symptoms is commonly caused by**_____
- a) Taro Beetle
 - b) Nematode
 - c) Fungi
 - d) Bacteria
6. The head usually contains pairs of joint appendages, which are sensory and used in feeding. Which of the following is not part of an insect head?
- a) Ommatidia
 - b) Antennae
 - c) Mandibles
 - d) legs
7. Diamond Back Moth is best classified under the pest categories of _____
- a) Insect
 - b) Arthropoda
 - c) Vertebrate pest
 - d) Invertebrates pest
8. Weeds that have been declared harmful or detrimental to humans, crops, livestock and the environment are known to be _____
- a) Noxious
 - b) Hardy
 - c) Weedy
 - d) Non-desired.
9. Weeds are very successful in nature because they are _____
- a) Very fast to reproduce
 - b) Not Very competitive
 - c) Not Tough
 - d) Not high viability

10. The Scientific name for Diamond Back Moth is _____

- a) *Maruca vitrata*
- b) *Plutella xylostella*
- c) *Epilachna vigintioctopunctata*
- d) *Papuana uniondis*

11. A Diamond Back Moth adult may only live only for about

- a) 10 days
- b) 20 days
- c) 30 days
- d) None of the above

12. Before pupating, the larva constructs a **barrel shaped silken cocoon** which open at **both end and is attached to the leaf surface**. This behavior of pupation is characterized in which of these following pests?

- a) Diamond back moth
- b) Bean Pod Borer
- c) Pumpkin Beetle
- d) Leaf Roller

13. Scientific name for Taro Beetle is _____

- a) *Maruca vitrata*
- b) *Plutella xylostella*
- c) *Epilachna vigintioctopunctata*
- d) *Papuana uniondis*

14. The Bean Pod Borer belongs to the insect order of _____

- a) Lepidoptera
- b) Coleoptera
- c) Hemiptera
- d) Crambidae

15. Taro beetle is an economic pest of Taro in Fiji. It belongs to the class Insecta under the order?
- a) Lepidoptera
 - b) Coleoptera
 - c) Hemiptera
 - d) Scarabaeidae
16. An insect has different life stages and can either go through any one of the two different life cycles. The 28 spotted ladybird beetle is a pest of solanaceous crops; Identify which of the following life stage and life cycle it goes through.
- a) Egg, Nymph, Adult
 - b) Egg, Pupa, larvae, Adult
 - c) Egg, Larvae, Pupa, Adult
 - d) Egg, Nymph, Pupa, Adult
17. In the History of IPM, Entomologist discovered that the properties present in DDT can be used to control pests. In which of the following year was this discovery made?
- a) 1950s-1960s
 - b) 1942
 - c) 1946
 - d) 1932
18. In which year DDT was no longer suitable as a pest control method due to the fact that majority of the pest has become resistant to the properties of DDT.
- a) 1950s-1960s
 - b) 1942
 - c) 1946
 - d) 1932

19. A individual thin cell strand that grows underground and makes up the body of Fungi is known as _____
- a) Mycelium
 - b) Hyphae
 - c) Spores
 - d) Fruiting Body.
20. Bacteria are microscopic organisms that are sometime considered as pathogen in nature. Unlike other microorganism, bacteria reproduce by themselves through _____
- a) Fusion
 - b) Fission
 - c) Lay eggs
 - d) Produce Spores

Section B: True or False
question)

(10 Marks) = (1 Mark for each

1. A pathogen is referred to as a microorganism when it affects the GROWTH, DEVELOPMENT and SURVIVAL of other living organism.
2. Climate can be defined as “an interest of a distinct alteration in temperature, rainfall, wind patterns, or other climatic conditions of a particular area over a long period of time”.
3. In the classification of insects, the phylum Arthropoda is the highest level of its classification?
4. The 28 spotted ladybird beetles is a major pest of eggplant.
5. Kava die back disease is a serious disease of kava. The organism that causes this disease is *Phytophthora colocasiae*.
6. Nematodes are segmented round worms, and are the most abundant multicellular animals on earth. There is only about 10 % of its species that are plant parasitic.
7. For a disease to occur it requires 3 factors, one of which is a virulent host.

8. Mosaic Virus is a pathogen that are normally transferred or dispersed by wind.
9. The body parts of bacteria are Head, Flagellum, Tail, DNA and Base plate.
10. In the Year 1970, gun powder (DDT) was banned to be used as a chemical pest control because of its impact on the health of people and the environment.

Section C: Match Column B into Column A

(10 Marks)

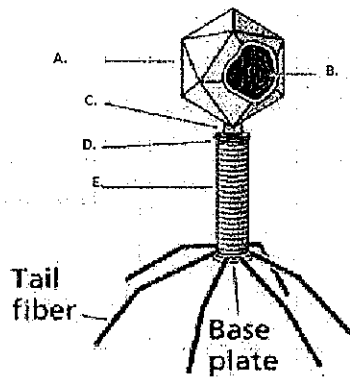
	Column A		Column B
1	Heterotrophic	a	Cucumber
2	Cephalothorax	b	Bacteria
3	Cucumber Mosaic Virus	c	Parasitoids
4	1967	d	Vertebrate Pest
5	1969	e	Virus
6	Prokaryotic	f	Spider
7	<i>Aulacophora similis</i>	g	IPM was officiated (formalized) in USA
8	Biological Control	h	Kava
9	Mynah Bird	i	Fungi
10	Pathogen	j	Formulation of IPM

Section D: Short answer

(40 Marks)

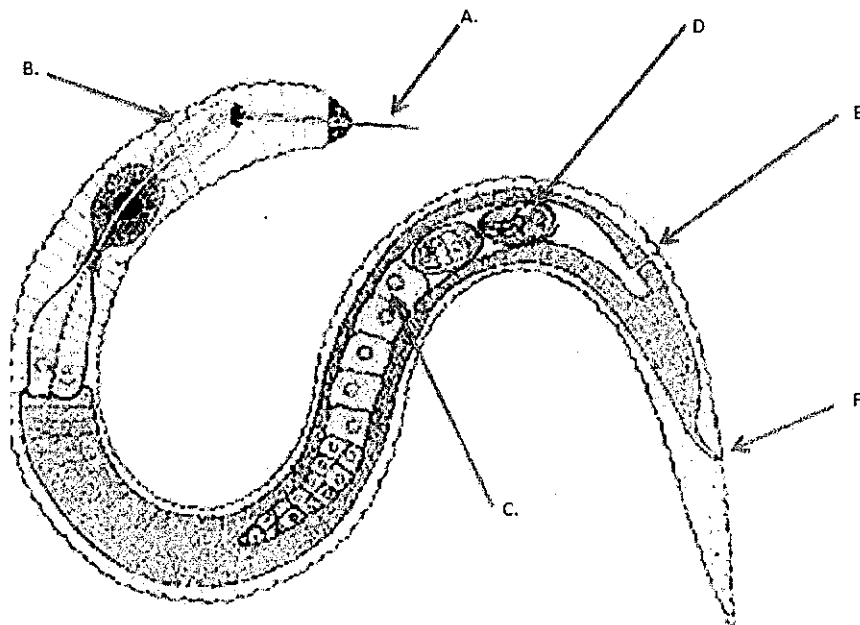
1. **Define the following terms:**
 - a) Climate Change (1 Mark)
 - b) Pest (1 Mark)
 - c) Disease (1 Mark)
2. Differentiate between Economic threshold level and Economic injury level (2 Marks)
3. Explain your understanding on the relationship between climate change with pest and disease (2 Marks)
4. **List** down the level of classification (3.5 Marks)
5. **List** the characteristics of arthropods (3 Marks)
6. **List** down the two classes that belong to the phylum arthropoda (2 Marks)
7. **List** the four categories of pest and give example for each (2 Marks)
8. **Differentiate** between and insect pest and weeds (2 Marks)
9. **Draw and explain** the disease triangle (1 Marks)
10. **Draw** the life cycle of *Plutella xylostella* showing the four stages it goes through (4 Marks)
11. **List** down four pathogens (2.5 Marks)

12. **Label** the morphology of a virus drawn below (5 Marks)



13. **State** five characteristics of bacteria (2.5 Marks)

14. **Label** the parts of a Nematode drawn below (3.5 Marks)



15. Draw and label:

- (i) Coenocytic hyphae and (1 Mark)
- (ii) Septate hyphae (1 Mark)

Section E: Essay

(20 Marks)

1. You are being invited to an agriculture show that is to be held in Nausori at Syria Park to deliver a lecture segment during. **Briefly describe** the following which you will present in your lecture:
 - a) Classification of insects (1.5 Marks)
 - b) Characteristics of insects (2.5 Marks)
 - c) Draw and label the general morphology of an insect (6 Marks)

2. You are an agriculture extension officer based at Lakena Station. Next week you will visit Aisake, a farmer in Lomaivuna who is having difficulties in controlling his cabbage pests. You are to introduce him to “Integrated Pest Management” (IPM). Describe the following components of IPM.
 - a) Definition of IPM (1 Mark)
 - b) State the aims of IPM (3 Marks)
 - c) Components of IPM (2.5 Marks)
 - d) Steps of creating an IPM Control method. (3.5 Marks)