# THE UNIVERSITY OF ZAMBIA
## SCHOOL OF AGRICULTURAL SCIENCES
## DEPARTMENT OF PLANT SCIENCE

**PROGRAMME: BACHELOR OF SCIENCE IN AGRICULTURE - THIRD YEAR**

**2017/2018 ACADEMIC YEAR, TERM II**

**AGC 3342: CROP PROTECTION**

**FINAL EXAMINATION**

**DATE: 21st November, 2018** **TIME: 09:00 – 12:00Hrs** **VENUE: Omnia 1**

**INSTRUCTIONS:**

1) INSTRUCTIONS ARE GIVEN AT THE BEGINNING OF EACH SECTION
2) DURATION OF EXAM IS 3 (THREE) HOURS
3) EACH SECTION SHOULD BE ANSWERED IN A SEPARATE ANSWER BOOKLET

## SECTION A: PLANT PATHOLOGY (40 MARKS)

**Instructions: Answer question 1 and any other**

**Question 1**

a) Indicate whether the following statements are true or false **[10 marks]**

i. Particle morphology, genome properties, biological properties and serological properties are all characters used in classifying some wilt-causing pathogens
ii. Infection of plant roots by fungi may lead to the disease called damping-off
iii. All viruses consist of a core (DNA or RNA), a capsid and an envelope
iv. Mosaics on plant roots are symptoms of viral diseases
v. In integrated disease management (IDM), chemical control should be used very carefully due to its possible hazardous effects on humans and the environment and should be prioritized.
vi. *Pseudomonas*, *Sclerotinia* and *Erwinia* are all genera containing plant pathogenic bacteria
vii. Wilting is always a result of bacterial and fungal pathogen attack on a plant
viii. Nematodes require a stylet for them to enter plant tissue
ix. A plant showing witch's broom symptoms could be infected by a mollicute or a nematode
x. A gall is a result of production of hormones by the plant, pathogen or both

b) Explain the following terminologies as used in plant pathology **[10 marks]**

i. Phyllody
ii. Alternate host.
iii. Disease triangle
iv. Spiroplasma
v. Scab

**Question 2**

A disease epidemic has broken out on tomatoes in Lusaka district. As the District Agricultural Coordinator (DACO) for Lusaka you have been tasked to identify the causal organism of this epidemic and to suggest remedial measures for the disease. Explain how you would identify the causal organism, and how you would apply koch's postulates in this situation. **[10 marks]**

**Question 3**

Complete the following table **[10 marks]**

| Pathogen group | Example of organism (Scientific name/binomial name) | Name of disease caused by the example organism | One symptom of the disease given |
|---|---|---|---|
| Fungi | | | |
| Bacteria | | | |
| Virus | | | |

**SECTION B: ENTOMOLOGY (30 MARKS)**

**Instructions: Answer question 4 and any other**

**Question 4**

In the 1950's Carl Linnaeus, a Swedish scientist suggested a system of binomial nomenclature that is used universally today by all scientists across the world.

a. What is binomial nomenclature? (2 marks)
b. Define the term taxonomy. (1 mark)
c. Use a 7 taxonomic hierarchy to classify a honey bee. (7 marks)
d. List six different types of insect antennae. (6 marks)
e. Briefly explain the type of mouth parts found in honey bee. (4 marks)

**Question 5**

Explain host plant resistance as a method for controlling insect pests. (10 marks)

**Question 6**

Insects can have an enormous detrimental impact on agriculture and related activities.

i. Explain the reasons why insects become pests. (7 marks)
ii. Define Integrated Pest Management (IPM). (3 marks)

## SECTION C: WEED SCIENCE (30 MARKS)

**Instructions: Answer question 7 and any other**

**Question 7**

Define the following terminologies used in Weed Science, and explain how they might complicate weed management **[20 marks]**

i. Allelopathy
ii. Noxious
iii. Reproductive capacity
iv. Perennial weeds
v. Parasitic weeds

**Question 8**

Weeds are a big challenge to agricultural productivity. Understanding characteristics of weeds and how they cause losses is an important first step in designing weed management strategies.

a. Explain the **five** (5) characteristics of weeds, and in doing so, give one example of a weed species in each of the 5 categories. **[5 marks]**
b. Explain the 4 ways in which weeds indirectly cause losses in agriculture **[5 marks]**

**Question 9**

Biological control of weeds is one of the most environmentally friendly approaches to weed management. Explain the **five** (5) biological control approaches used to manage weeds **[10 marks]**

**END OF EXAM**