6. What is molting?
   a. The stage when an insect begins its life as an adult
   b. The stage when an insect emerges from the egg to become an embryo
   c. The shedding of the hard, outer layer of skin between instars
   d. The shedding of the soft, inner layer of skin between instars
7. What are the two parts of the scientific name of an insect?
   a. Order and family name
   b. Genus and species name
   c. First and last name
   d. Incomplete and complete name
8. What are the four groups of insect control methods?
   a. Cultural, environmental, physical, and chemical
   b. Biological, cultural, environmental, and genetic
   c. Biological, cultural, physical and mechanical, and chemical
   d. Physical and mechanical, chemical, insecticides, and biological

SECTION B

Write **True** or **False** against the following statement:-

1. Insects have a closed circulatory system False
2. The incurrent and excurrent ostia are found in the aorta of insects False
3. The key function of the insect circulatory system is to transport oxygen False
4. The Dorsal vessel is located ventrally in insects False
5. The only abdominal appendage in adult insects are a terminal pair of cerci False

SECTION C

1. Describe the following terms, and name particular insects that have them; (3 marks)
   a. Haltare
   b. Fossorial legs
   c. Natatorial legs
2. Distinguish with named examples, two (2) major types of Insect metamorphosis (6 marks)
3. In which orders do the following insects belong; (3 marks)
   a. Dragonflies
   b. Thrips
   c. Moths

END OF TEST

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

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

Section C

1. (a) Halteres — These are wing modifications (hind wings). They are found in House flies. These are used for balancing when flying.

(b) Fossorial legs - These are legs used for digging e.g. Crickets.

(c) Natatorial legs - These are legs used for swimming e.g.

2. Complete metamorphosis

(a) Complete metamorphosis - In this type, there is drastic change in body development. It comprises of four stages namely:- Egg - larva - pupa - adult.
- The insects look different from the adult and feed on different material and sometimes have different habitats.
- e.g. Butterflies, Moths.

(b) Incomplete metamorphosis - In this type there is gradual change in body development. It comprises of three stages:

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]**

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iii. Reproductive capacity
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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

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SECTION C

Halteres — These are wing modifications (hind wings). They are found in Houseflies. These are used for balancing when flying.

) Fossorial legs - These are legs used for digging e.g Crickets. mole cricket

) Natatorial legs - These are legs used for Swimming e.g ...

~~Complete metamorph~~

) Complete metamorphosis - In this type, there is Drastic Change in body development. It Comprises of four stages namely:- Egg - larva - pupa & adult.
- The immatures look different from the adults and feed on different material and sometimes have different habitats.
- e.g Butterflies, Moths.

(3)

) Incomplete metamorphosis - In this type there is gradual Change in body development. It comprises of three stages

(3)

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)

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

AGC 3342: TEST 2 (25 Marks)

DURATION: 1 hour

INSTRUCTIONS: Answer all questions and illustrate your answers were necessary

Section A

1. What body features do all insects have in common?
   a. Three body regions, six legs, wings
   b. Hardened body regions, antennae, compound eyes
   c. Three body regions, antennae, six legs
   d. Hardened skeleton, antennae, wings
2. What are the four groups of insect control methods?
   a. Cultural, environmental, physical, and chemical
   b. Biological, cultural, environmental, and genetic
   c. Biological, cultural, physical and mechanical, and chemical
   d. Physical and mechanical, chemical, insecticides, and biological
3. What are two types of insect mouth parts?
   a. Chewing and sucking
   b. Sucking and slurping
   c. Grinding and tearing
   d. Tearing and siphon
4. Which two phases is an insect between when it is a larva?
   a. Nymph and adult
   b. Pupa and egg
   c. Larva and pupa
   d. Egg and pupa
5. In which stage are insects identified by instars and molting?
   a. Immatures
   b. Embryos
   c. Adults
   d. Pupa

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

AGC 3342: TEST 2 (25 Marks)

DURATION: 1 hour

INSTRUCTIONS: Answer all questions and illustrate your answers were necessary

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Section A

1. What body features do all insects have in common?
   a. Three body regions, six legs, wings
   b. Hardened body regions, antennae, compound eyes
   c. Three body regions, antennae, six legs
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   d. Physical and mechanical, chemical, insecticides, and biological
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   c. Larva and pupa
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5. In which stage are insects identified by instars and molting?
   a. Immatures
   b. Embryos
   c. Adults
   d. Pupa

THE UNIVERSITY OF ZAMBIA

SCHOOL OF AGRICULTURAL SCIENCES

DEPARTMENT OF PLANT SCIENCE

Third Year Examination for Bachelor of Agricultural Sciences

AGC 3342: Crop Protection

2014/15 Final Examination

Date: 24th June, 2015 **Time: 09:00 – 12:00 hrs** **Venue: GLT**

Instructions:

- There are two (2) sections in this Examination Paper
- Each section should be answered in a **separate answer booklet**
- The examination paper contains six (6) questions. Answer **any five (5)** questions
- You will therefore answer at **least two questions** in each section

SECTION A: PLANT PATHOLOGY

Question 1 (20 marks)

a) It has been announced that a new race of a bacteria, *Xanthomonas phaseoli* is gram-positive. You have been tasked to confirm that declaration. How do you go about with the task? (8 marks)

b) List any four reasons that have led to the success of plant pathogenic fungi. (4 marks)

c) Explain any four symptoms associated with non-pathogenic plant disorder. (8 marks)

Question 2 (20 marks)

Explain the following terminologies as used in plant pathology

i. Sign
ii. Koch's postulates
iii. Inoculum
iv. Avirulence
v. Biotroph
vi. Integrated Disease Management (IDM)

7. What are the two parts of the scientific name of an insect?

   a. Order and family name
   b. Genus and species name ✓
   c. First and last name
   d. Incomplete and complete name

8. What is moulting?

   a. The stage when an insect begins its life as an adult
   b. The stage when an insect emerges from the egg to become an embryo
   c. The shedding of the hard, outer layer of skin between instars
   d. The shedding of the soft, inner layer of skin between instars

9. How can removing weeds and crop residues help control insects?

   a. Removes a favourable living environment for insects ✓
   b. Attracts insects that spread to crop plants
   c. Keeps insects alive between crop plantings
   d. Provides an underground haven for insects

10. Which of the following is an advantage of crop rotation?

   a. Changing the host species and environment increases insect population build up.
   b. Involves a higher level of management skills
   c. Especially effective with insects that are very mobile.
   d. Disrupts the life cycle of the insect. ✓

SECTION B (10 marks) 10

Provide short answers to the following questions:

1. To which orders do moths and beetles belong? (2 marks) → Moths – Lepidoptera ✓ Beetles – Coleoptera ✓ (2)
2. Which immature stage does not eat or move at all? (1 mark) → pupa ✓ (1)
3. Which segments of the thorax bear wings? (2 mark) → Meso thorax ✓ Meta thorax ✓ (2)
4. Which immature stage of insects eats the same food as adults? (1 mark) → Nymph ✓ (1)
5. Insects without wings are called? (1 mark) → Apterygotes ✓ (1)
6. State the 3 types of resistance in plants? (3 marks)
   ① Antibiosis ✓
   ② Antixenosis ✓
   ③ Tolerance ✓ (3)

SECTION C (10 marks)

Briefly answer the following:

1. What is Inoculative and inundative releases in Biological control of pests? (2 marks)
2. State (5) techniques of cultural control of pests (5 marks)
3. Explain (3) ways of using insecticides responsibly (3 marks)

END OF TEST

Name: JUDITH TIZA MWANSUKWA Comp #: 13105451

AGC 3342: CROP PROTECTION (ENTOMOLOGY SECTION)

1. Define entomology?

2. Insects are classified as belonging to the Phylum Arthropoda. What is the meaning of the word Arthropoda?

3. Name the class to which insects belong.

4. What are the six (6) general characteristics of the insects?

5. Name the three main parts of an insect body.

6. What are the two main groups of insect mouth parts?

7. Which insect order contains the most insect species?

8. All insects are pests? Justify your answer.

9. If you saw an entomological word, Miridae, which you didn't know, you would still absolutely know that it was........................

10. Which monitoring device would be the best for nocturnal insects?

11. Define Integrated Pest Management?

12. Which insecticide would be more appropriate for sucking insects like aphids?

13. On which insect body do you find insect wings?

14. Name ten (10) insect orders you know.

15. Write five (5) scientific names of any insects you know.

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxEND OF EVALUATIONxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

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

b) Antibiosis vs antixenosis

Question 6 (20 marks)

a) Describe the three modes of entry of pesticides into the spray operator's body.

b) Explain how the operator would protect herself or himself during the spray programme.

c) Define LD50. Discuss two types of pesticide toxicity.

END OF EXAMINATION

10/14

Name: MUSONDA MULESHA Comp #: 12028371

AGC 3342: CROP PROTECTION (ENTOMOLOGY SECTION) Date: May 6, 2015

1. TRUE/FALSE (1 MARK EACH)

(4)

1. Insect sweep net is good for collecting flying insects. True ✓
2. Light traps can be effective method in sampling diurnal insects from the air. false ✓
3. Significant levels of pesticide resistance have now been reported in less than 500 insect species. ~~True~~ false ✓
4. Diamondback moth is an accidental introduced pest in Zambia. ~~True~~ false ✗
5. Timely harvesting is a cropping technique for checking the sweet potato weevil. True ✓

2. Multiple choice (1 Mark each)

(6)

i. Which of the following is true?
A. All arthropods are insects B. All insects are Crustaceans C. All insects are Arthropods D. All Crustaceans are insects

ii. A person Who studies insects is an ?
A. Insectologist B. Entymologist C. Etymologist D. Entomologist

iii. Which of the following statements is not true about the general characteristics of insects?
A. Insects body is bilateral symmetry B. Insects have an endoskeleton C. Insects have six jointed legs D. Insects have three main body tagmata

iv. Insects are beneficial to human beings because
A. They act as vectors of diseases and viruses B. They destroy food C. They are contaminants D. None of the above.

v. Insects are among the most successful arthropods because of the following reasons:
A. Ability to fly B. Have an exo- skeleton C. Have a high reproductive potential D. All of the above

vi. Which monitoring device would be the best for crawling insects?
A. Sweep net B. Sticky trap C. Pitfall trap C. light trap.

vii. Which common name is INCORRECTLY written? A. Horsefly C. Stonefly B. Dragonfly D. Sawfly

viii. Pest outbreaks tend to occur when: A. Crops are planted in monoculture. B. Natural enemies are imported from abroad. C. Farmers switch to new crops. D. All of these.

ix. Patterns of crop protection have gone through five phases in terms of discovery and use of insecticides which ultimately led to integrated pest management. Which phase below does not belong to stages of crop protection?
A. Gregarious phase B. Disaster phase C. Integrated management phase D. Crisis phase.

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxEND OF QUIZxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

NAME : CHAMA INONGE
ID : 2016140326

27/29 93%

AGC 3342: TEST 1 (Entomology component)

DURATION: 45 minutes

TOTAL MARKS: 30

INSTRUCTIONS: Answer all questions and illustrate your answers were necessary

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SECTION A (10 marks)

1. What body features do all insects have in common?
   a. Three body regions, six legs, wings
   b. Hardened body regions, antennae, compound eyes
   (c) Three body regions, antennae, six legs ✓
   d. Hardened skeleton, antennae, wings
2. What are the three groups of insect control methods?
   a. Cultural, environmental, and chemical
   b. Biological, cultural, environmental
   c. Natural enemies, cultural, and pesticides
   (d) Chemical, cultural, and biological ✓
3. What are two types of insect mouth parts?
   (a) Chewing and sucking ✓
   b. Sucking and slurping
   c. Grinding and tearing
   d. Tearing and siphon

(9)

4. Which two phases is an insect between when it is a larva?
   a. Nymph and adult
   X (b) Pupa and egg
   c. Larva and pupa
   (d) Egg and pupa ✓
5. In which stage are insects identified by instars and molting?
   (a) Immatures ✓
   b. Embryos
   c. Adults
   d. Pupa
6. What is molting?
   a. The stage when an insect begins its life as an adult
   b. The stage when an insect emerges from the egg to become an embryo
   (c) The shedding of the hard, outer layer of skin between instars ✓
   d. The shedding of the soft, inner layer of skin between instars

6. What is molting?
   a. The stage when an insect begins its life as an adult
   b. The stage when an insect emerges from the egg to become an embryo
   c. The shedding of the hard, outer layer of skin between instars
   d. The shedding of the soft, inner layer of skin between instars
7. What are the two parts of the scientific name of an insect?
   a. Order and family name
   b. Genus and species name
   c. First and last name
   d. Incomplete and complete name
8. What are the four groups of insect control methods?
   a. Cultural, environmental, physical, and chemical
   b. Biological, cultural, environmental, and genetic
   c. Biological, cultural, physical and mechanical, and chemical
   d. Physical and mechanical, chemical, insecticides, and biological

SECTION B

Write **True or False** against the following statement:-

1. Insects have a closed circulatory system False
2. The incurrent and excurrent ostia are found in the aorta of insects False
3. The key function of the insect circulatory system is to transport oxygen False
4. The Dorsal vessel is located ventrally in insects False
5. The only abdominal appendage in adult insects are a terminal pair of cerci False

SECTION C

1. Describe the following terms, and name particular insects that have them; (3 marks)
   a. Haltare
   b. Fossorial legs
   c. Natatorial legs
2. Distinguish with named examples, two (2) major types of Insect metamorphosis (6 marks)
3. In which orders do the following insects belong; (3 marks)
   a. Dragonflies
   b. Thrips
   c. Moths

END OF TEST

SECTION-B ENTOMOLOGY-ANSWER QUESTION ONE (1) AND ANY OTHER

1. Insects are the most numerous animals in the world accounting for over 50 % of all described living organisms.
   a. Discuss the reasons why insects have been so successful in colonising the world. **(13 marks)**
   b. State the reasons why the study of insects (entomology) is important. **(5 marks)**
   c. Describe the role of insects in the biological control of pest species. **(2 marks)**

2. Carl Linnaeus in the 1750's suggested a method of naming organisms that is used universally by scientists all over the world.
   a. Using an insects of your choice, classify the insect using the seven (7) taxonomic hierarchy. **(7 marks)**
   b. List SIX (6) features of the class Insecta. **(3 marks)**

3. State the layers of the insect integument and explain their respective functions. **(10 marks)**

SECTION-C WEED SCIENCE-ANSWER QUESTION ONE (1) AND ANY OTHER

1. The study of weeds and their management is a challenging and demanding task that requires diverse abilities.
   a. Define weed control. **(1 mark)**
   b. Discuss the components of preventive weed control. **(16 marks)**
   c. List SIX (6) examples of edible weeds (with correct scientific names). **(3 marks)**

2. Explain any FOUR (4) categories of weed classification. **(10 marks)**

3. Define biological control of weeds and discuss the FIVE (5) major components of biological control of weeds. **(10 marks)**

END OF EXAMINATION

19/14

Name: MUSONDA MULESHA.... Comp #.....12028371............

AGC 3342: CROP PROTECTION (ENTOMOLOGY SECTION)

Date: May 6, 2015

1. TRUE/FALSE (1 MARK EACH)

1. Insect sweep net is good for collecting flying insects. True ✓ (4)
2. Light traps can be effective method in sampling diurnal insects from the air. false ✓
3. Significant levels of pesticide resistance have now been reported in less than 500 insect species. ~~True~~ false ✓
4. Diamondback moth is an accidental introduced pest in Zambia. ~~true~~ false ✗
5. Timely harvesting is a cropping technique for checking the sweet potato weevil. True ✓

2. Multiple choice (1 Mark each)

i. Which of the following is true?
A. All arthropods are insects B. All insects are Crustaceans C. All insects are Arthropods D. All Crustaceans are insects

ii. A person Who studies insects is an ?
A. Insectologist B. Entymologist C. Etymologist D. Entomologist

iii. Which of the following statements is not true about the general characteristics of insects?
A. Insects body is bilateral symmetry B. Insects have an endoskeleton C. Insects have six jointed legs D. Insects have three main body tagmata

iv. Insects are beneficial to human beings because (6)
A. They act as vectors of diseases and viruses B. They destroy food C. They are contaminants D. None of the above.

v. Insects are among the most successful arthropods because of the following reasons:
A. Ability to fly B. Have an exo- skeleton C. Have a high reproductive potential D. All of the above

vi. Which monitoring device would be the best for crawling insects?
A. Sweep net B. Sticky trap C. Pitfall trap C. light trap.

vii. Which common name is INCORRECTLY written? A. Horsefly C. Stonefly B. Dragonfly D. Sawfly

viii. Pest outbreaks tend to occur when: A. Crops are planted in monoculture. B. Natural enemies are imported from abroad. C. Farmers switch to new crops. D. All of these.

ix. Patterns of crop protection have gone through five phases in terms of discovery and use of insecticides which ultimately led to integrated pest management. Which phase below does not belong to stages of crop protection?
A. Gregarious phase B. Disaster phase C. Integrated management phase D. Crisis phase.

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxEND OF QUIZxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

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

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

AGC 3342: TEST 2 (25 Marks)

DURATION: 1 hour

INSTRUCTIONS: Answer all questions and illustrate your answers were necessary

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Section A

1. What body features do all insects have in common?
   a. Three body regions, six legs, wings
   b. Hardened body regions, antennae, compound eyes
   c. Three body regions, antennae, six legs
   d. Hardened skeleton, antennae, wings
2. What are the four groups of insect control methods?
   a. Cultural, environmental, physical, and chemical
   b. Biological, cultural, environmental, and genetic
   c. Biological, cultural, physical and mechanical, and chemical
   d. Physical and mechanical, chemical, insecticides, and biological
3. What are two types of insect mouth parts?
   a. Chewing and sucking
   b. Sucking and slurping
   c. Grinding and tearing
   d. Tearing and siphon
4. Which two phases is an insect between when it is a larva?
   a. Nymph and adult
   b. Pupa and egg
   c. Larva and pupa
   d. Egg and pupa
5. In which stage are insects identified by instars and molting?
   a. Immatures
   b. Embryos
   c. Adults
   d. Pupa

vii. Facultative saprophyte
viii. Systemic fungicide
ix. Capsid
x. Latent Infection

Question 3 (20 marks)

a) A farmer who has suffered low yield in maize on an acre of land due to *striga asiatica* infestation approached you for assistance on how this infestation can be managed. Explain to the farmer on how to manage *S. asiatica* infestation in an effort to obtain higher yields. (8 marks).

b) Describe the plant disease cycle, clearly stating how pathogens can be transmitted. (7 marks)

c) List any five symptoms associated with viral infection in plants. (5 marks)

SECTION B : ENTOMOLOGY

Question 4 (20 Marks)

The Swedish, Carl Linneaus, is known as the father of taxonomy and proposed the system of binomial nomenclature in 1758.

i. Define taxonomy.
ii. What is binomial nomenclature?
iii. Give an example of an insect scientific name.
iv. What makes an animal an insect?
v. Name the seven (7) taxonomic hierarchy used in classifying insects.
vi. Write the insect orders of house fly, dragonflies, sawflies and beetles.

Question 5 (20 marks)

i. Explain briefly six (6) reasons why insects are the most abundant and most diverse group of organisms on earth.

ii. Briefly discuss the five (5) ways of classifying pesticides with examples.

iii. Discuss the five stages in crop protection that led to integrated pest management.

iv. Which order of insects where control of insect pests by sex pheromones has been the most developed? Give two examples of the sex pheromones belonging to this order.

v. Distinguish between the following terms:

a) Gregarious parasitoids vs solitary parasitoids

6. What is molting?
   a. The stage when an insect begins its life as an adult
   b. The stage when an insect emerges from the egg to become an embryo
   c. The shedding of the hard, outer layer of skin between instars
   d. The shedding of the soft, inner layer of skin between instars
7. What are the two parts of the scientific name of an insect?
   a. Order and family name
   b. Genus and species name
   c. First and last name
   d. Incomplete and complete name
8. What are the four groups of insect control methods?
   a. Cultural, environmental, physical, and chemical
   b. Biological, cultural, environmental, and genetic
   c. Biological, cultural, physical and mechanical, and chemical
   d. Physical and mechanical, chemical, insecticides, and biological

SECTION B

Write **True or False** against the following statement:-

1. Insects have a closed circulatory system False
2. The incurrent and excurrent ostia are found in the aorta of insects False
3. The key function of the insect circulatory system is to transport oxygen False
4. The Dorsal vessel is located ventrally in insects False
5. The only abdominal appendage in adult insects are a terminal pair of cerci False

SECTION C

1. Describe the following terms, and name particular insects that have them; (3 marks)
   a. Haltare
   b. Fossorial legs
   c. Natatorial legs
2. Distinguish with named examples, two (2) major types of Insect metamorphosis (6 marks)
3. In which orders do the following insects belong; (3 marks)
   a. Dragonflies
   b. Thrips
   c. Moths

END OF TEST

b) Antibiosis vs antixenosis

Question 6 (20 marks)

a) Describe the three modes of entry of pesticides into the spray operator's body.

b) Explain how the operator would protect herself or himself during the spray programme.

c) Define LD50. Discuss two types of pesticide toxicity.

END OF EXAMINATION

SECTION-B ENTOMOLOGY-ANSWER QUESTION ONE (1) AND ANY OTHER

1. Insects are the most numerous animals in the world accounting for over 50 % of all described living organisms.
   a. Discuss the reasons why insects have been so successful in colonising the world **(13 marks)**
   b. State the reasons why the study of insects (entomology) is important. **(5 marks)**
   c. Describe the role of insects in the biological control of pest species. **(2 marks)**

2. Carl Linnaeus in the 1750's suggested a method of naming organisms that is used universally by scientists all over the world.
   a. Using an insects of your choice, classify the insect using the seven (7) taxonomic hierarchy. **(7 marks)**
   b. List SIX (6) features of the class Insecta. **(3 marks)**

3. State the layers of the insect integument and explain their respective functions. **(10 marks)**

SECTION-C WEED SCIENCE-ANSWER QUESTION ONE (1) AND ANY OTHER

1. The study of weeds and their management is a challenging and demanding task that requires diverse abilities.
   a. Define weed control. **(1 mark)**
   b. Discuss the components of preventive weed control. **(16 marks)**
   c. List SIX (6) examples of edible weeds (with correct scientific names). **(3 marks)**

2. Explain any FOUR (4) categories of weed classification. **(10 marks)**

3. Define biological control of weeds and discuss the FIVE (5) major components of biological control of weeds. **(10 marks)**

END OF EXAMINATION

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

Third Year Examination for Bachelor of Agricultural Sciences

AGC 3342: Crop Protection

2014/15 Final Examination

Date: 24th June, 2015 Time: 09:00 – 12:00 hrs Venue: GLT

Instructions:

- There are two (2) sections in this Examination Paper
- Each section should be answered in a **separate answer booklet**
- The examination paper contains six (6) questions. Answer **any five (5)** questions
- You will therefore answer at **least two questions** in each section

SECTION A: PLANT PATHOLOGY

Question 1 (20 marks)

a) It has been announced that a new race of a bacteria, *Xanthomonas phaseoli* is gram-positive. You have been tasked to confirm that declaration. How do you go about with the task? (8 marks)

b) List any four reasons that have led to the success of plant pathogenic fungi. (4 marks)

c) Explain any four symptoms associated with non-pathogenic plant disorder. (8 marks)

Question 2 (20 marks)

Explain the following terminologies as used in plant pathology

i. Sign
ii. Koch's postulates
iii. Inoculum
iv. Avirulence
v. Biotroph
vi. Integrated Disease Management (IDM)

THE UNIVERSITY OF ZAMBIA

SCHOOL OF AGRICULTURAL SCIENCES

DEPARTMENT OF PLANT SCIENCE

Third Year Examination for Bachelor of Agricultural Sciences

AGC 3342: Crop Protection

2015/16 Final Examination

Date: 7th July, 2016 **Time: 09:00 – 12:00 hrs** **Venue: GLT**

Instructions:

- There are three (3) sections in this Examination Paper
- Answer section A and the other sections (both B and C) in two separate answer booklets
- You are required to answer a total of 6 questions

SECTION A (40 MARKS): PATHOLOGY- ANSWER ANY TWO QUESTIONS

Question 1

a) Discuss how Witchweed (*Striga spp)* causes parasitism in higher plants, clearly highlighting the mechanisms employed and how the process is initiated. (14 marks)

b) Explain any three ways which has led to a success of plant pathogenic fungi. (6 marks)

Question 2

a) A disastrous race of a bacterial pathogen, *Colletotrichum lindemuthianum* which exists in Malawi and causes anthracnose disease in common beans is been suspected to have crossed over to Chipata district in Zambia. How would you prove for certain that the new race of the pathogen existing in Zambia is the same race as the known Malawian one. (14 marks)

b) Explain any three causes of non-pathogenic plant disorder. (6 marks)

Question 3

a. Explain the differences between a sign and a symptom with reference to plant disease diagnosis. (6 marks)

b. List four symptoms associated with plant viral infections (4 marks)

c. Explain the concept of "Plant Disease Triangle" as used in plant pathology. (10 marks)

SECTION B ENTOMOLOGY- ANSWER QUESTION 4 AND ANY OTHER

Question 4

Insects are found in almost every conceivable habitat on the planet earth.

a. Discuss the reasons that have made Insects very successful animals on earth (12 marks).

b. There is an increasing realization about the importance of insects to man and the ecosystem. Discuss (8 marks).

Question 5

Insects mainly depend on chemical signals for their communication. Describe the different groups of semiochemicals (10 marks).

Question 6

Briefly describe how insects become pests (10 marks)

SECTION C: WEED SCIENCE- ANSWER QUESTION 7 AND ANY OTHER

Question 7

Weeds are among pests of great economic importance in agriculture. Before a control measure is applied, correct identification of a weed forms a key preliminary step.

a. Discuss the major classifications of weeds (12 marks).

b. State the characteristics of annual weeds (4 marks).

c. List 4 examples of perennial weeds (with correct scientific names) (4 marks).

Question 8

Define cultural control, and state 8 of its components (10 marks).

Question 9

What is biological control of weeds? Briefly state 5 major components of biological control of weeds (10 marks).

END OF EXAMINATION

THE UNIVERSITY OF ZAMBIA

SCHOOL OF AGRICULTURAL SCIENCES

DEPARTMENT OF PLANT SCIENCE

AGC 3342: Crop Protection

Test 1 **Duration: 2 hrs** **1st JULY 2016** **ANSWER ALL QUESTIONS**

Question 1

Write short notes on the following

a. Solarisation as used in Nematode Control **(5 marks)**

b. Integrated Disease Management **(5 marks)**

c. Continuous Infection chain **(5 marks)**

Question 2

i. Define the following terminologies used in plant pathology **(12 marks)**

a. Avirulence
b. Inoculum
c. Facultative Saprophyte
d. Susceptible
e. Pathogenesis
f. Nectroph

ii. Explain four ways on why plant diseases are important **(8 marks)**

Question 3

a) With the aid of an illustration and appropriate examples discuss the plant disease cycle as conceptualized in plant pathology **(13 marks)**

b) A new race of *Agrobacterium tumafaciens* is been suspected to be gram positive. Explain in detail how you can verify this claim **(12 marks)**

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)

THE UNIVERSITY OF ZAMBIA

SCHOOL OF AGRICULTURAL SCIENCES

DEPARTMENT OF PLANT SCIENCE

Third Year Examination for Bachelor of Agricultural Sciences

AGC 3342: Crop Protection

Date: 30th August 2017 **Time: 09:00 – 12:00 hrs** **Venue: Other Rooms**

Instructions:

- There are three (3) sections in this Examination Paper
- You are required to answer a total of 6 (six) questions
- Answer section A in one booklet and other sections (B and C) in another booklet

SECTION A (20 MARKS): PATHOLOGY- ANSWER ANY TWO QUESTIONS

Question 1

a) Explain the following terminologies as used in plant pathology **[12 marks]**

i. Inoculum
ii. Viral Envelope
iii. Latent infection
iv. Necrotroph
v. Systemic fungicide
vi. Pathogenesis

b) Discuss key differences among symptoms associated with Viral and Bacterial pathogenic infection in plants **(8 marks)**

Question 2

a) Describe in detail how Witchweed (*Striga spp)* causes parasitism in cereals, clearly explaining how germination of a *Striga asiatica* seed is initiated. **(12 marks)**

b) Explain any four factors which have led to the success of the plant pathogenic fungi **(8 marks)**

Question 3

a) Illustrating with appropriate examples, discuss any four shapes associated with particle morphology classification of plant pathogenic viruses. **(12 marks)**

b) Explain the four categories of plant pathogenic nematodes **(8 marks)**

namely :- Egg — Nymph ✓ — adult

- The immature looks similar to the adult and eat the same food.
- e.g Grasshoppers

Q3 ② Dragonflies — Odonata ✓

(2) ⓑ Thrips — Homoptera ×

ⓒ Moths — Lepidoptera ✓

vii. Facultative saprophyte
viii. Systemic fungicide
ix. Capsid
x. Latent Infection

Question 3 (20 marks)

a) A farmer who has suffered low yield in maize on an acre of land due to *striga asiatica* infestation approached you for assistance on how this infestation can be managed. Explain to the farmer on how to manage *S. asiatica* infestation in an effort to obtain higher yields. (8 marks).

b) Describe the plant disease cycle, clearly stating how pathogens can be transmitted. (7 marks)

c) List any five symptoms associated with viral infection in plants. (5 marks)

SECTION B : ENTOMOLOGY

Question 4 (20 Marks)

The Swedish, Carl Linneaus, is known as the father of taxonomy and proposed the system of binomial nomenclature in 1758.

i. Define taxonomy.
ii. What is binomial nomenclature?
iii. Give an example of an insect scientific name.
iv. What makes an animal an insect?
v. Name the seven (7) taxonomic hierarchy used in classifying insects.
vi. Write the insect orders of house fly, dragonflies, sawflies and beetles.

Question 5 (20 marks)

i. Explain briefly six (6) reasons why insects are the most abundant and most diverse group of organisms on earth.

ii. Briefly discuss the five (5) ways of classifying pesticides with examples.

iii. Discuss the five stages in crop protection that led to integrated pest management.

iv. Which order of insects where control of insect pests by sex pheromones has been the most developed? Give two examples of the sex pheromones belonging to this order.

v. Distinguish between the following terms:

a) Gregarious parasitoids vs solitary parasitoids

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

THE UNIVERSITY OF ZAMBIA

SCHOOL OF AGRICULTURAL SCIENCES

DEPARTMENT OF PLANT SCIENCE

Third Year Examination for Bachelor of Agricultural Sciences

AGC 3342: Crop Protection

Date: 30th August 2017 **Time: 09:00 – 12:00 hrs** **Venue: Other Rooms**

Instructions:

- There are three (3) sections in this Examination Paper
- You are required to answer a total of 6 (six) questions
- Answer section A in one booklet and other sections (B and C) in another booklet

SECTION A (20 MARKS): PATHOLOGY- ANSWER ANY TWO QUESTIONS

Question 1

a) Explain the following terminologies as used in plant pathology **[12 marks]**

i. Inoculum
ii. Viral Envelope
iii. Latent infection
iv. Necrotroph
v. Systemic fungicide
vi. Pathogenesis

b) Discuss key differences among symptoms associated with Viral and Bacterial pathogenic infection in plants **(8 marks)**

Question 2

a) Describe in detail how Witchweed (*Striga spp)* causes parasitism in cereals, clearly explaining how germination of a *Striga asiatica* seed is initiated. **(12 marks)**

b) Explain any four factors which have led to the success of the plant pathogenic fungi **(8 marks)**

Question 3

a) Illustrating with appropriate examples, discuss any four shapes associated with particle morphology classification of plant pathogenic viruses. **(12 marks)**

b) Explain the four categories of plant pathogenic nematodes **(8 marks)**

vii. Facultative saprophyte
viii. Systemic fungicide
ix. Capsid
x. Latent Infection

Question 3 (20 marks)

a) A farmer who has suffered low yield in maize on an acre of land due to *striga asiatica* infestation approached you for assistance on how this infestation can be managed. Explain to the farmer on how to manage *S. asiatica* infestation in an effort to obtain higher yields. (8 marks).

b) Describe the plant disease cycle, clearly stating how pathogens can be transmitted. (7 marks)

c) List any five symptoms associated with viral infection in plants. (5 marks)

SECTION B : ENTOMOLOGY

Question 4 (20 Marks)

The Swedish, Carl Linneaus, is known as the father of taxonomy and proposed the system of binomial nomenclature in 1758.

i. Define taxonomy.
ii. What is binomial nomenclature?
iii. Give an example of an insect scientific name.
iv. What makes an animal an insect?
v. Name the seven (7) taxonomic hierarchy used in classifying insects.
vi. Write the insect orders of house fly, dragonflies. sawflies and beetles.

Question 5 (20 marks)

i. Explain briefly six (6) reasons why insects are the most abundant and most diverse group of organisms on earth.

ii. Briefly discuss the five (5) ways of classifying pesticides with examples.

iii. Discuss the five stages in crop protection that led to integrated pest management.

iv. Which order of insects where control of insect pests by sex pheromones has been the most developed? Give two examples of the sex pheromones belonging to this order.

v. Distinguish between the following terms:

a) Gregarious parasitoids vs solitary parasitoids

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)

(3) Insecticides responsibly

i) By knowing the affected crop and the type of insects that are in the field, can help in the use of insecticides responsibly. (1)

ii) Monitoring the field, helps in the use insecticides responsibly by identifying the insects earlier in the field.

iii) Knowing the type of insecticides to be used in the affected area and on the type of an insect found in the field.

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

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

AGC 3342: TEST 2 (25 Marks)

DURATION: 1 hour

INSTRUCTIONS: Answer all questions and illustrate your answers were necessary

Section A

1. What body features do all insects have in common?
   a. Three body regions, six legs, wings
   b. Hardened body regions, antennae, compound eyes
   c. Three body regions, antennae, six legs
   d. Hardened skeleton, antennae, wings
2. What are the four groups of insect control methods?
   a. Cultural, environmental, physical, and chemical
   b. Biological, cultural, environmental, and genetic
   c. Biological, cultural, physical and mechanical, and chemical
   d. Physical and mechanical, chemical, insecticides, and biological
3. What are two types of insect mouth parts?
   a. Chewing and sucking
   b. Sucking and slurping
   c. Grinding and tearing
   d. Tearing and siphon
4. Which two phases is an insect between when it is a larva?
   a. Nymph and adult
   b. Pupa and egg
   c. Larva and pupa
   d. Egg and pupa
5. In which stage are insects identified by instars and molting?
   a. Immatures
   b. Embryos
   c. Adults
   d. Pupa

19/14

Name:..JUDITH JIZA MWAFULUWA.Comp #...12105481 2028371

AGC 3342: CROP PROTECTION (ENTOMOLOGY SECTION)

Date: May 6, 2015

(4)

1. Define entomology?

2. Insects are classified as belonging to the Phylum Arthropoda. What is the meaning of the word Arthropoda?

3. Name the class to which insects belong.

4. What are the six (6) general characteristics of the insects?

5. Name the three main parts of an insect body.

6. What are the two main groups of insect mouth parts?

7. Which insect order contains the most insect species?

8. All insects are pests? Justify your answer.

9. If you saw an entomological word, Miridae, which you didn't know, you would still absolutely know that it was.........................

10. Which monitoring device would be the best for nocturnal insects?

11. Define Integrated Pest Management?

12. Which insecticide would be more appropriate for sucking insects like aphids?

13. On which insect body do you find insect wings?

14. Name ten (10) insect orders you know.

15. Write five (5) scientific names of any insects you know.

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx*END OF EVALUATION*xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

CHAMIN INONGE
2016140326

SECTION C

(8)

(1) Inoculative release ✓ is a biological.

This is when there is small release of the natural enemies to suppress the pest population by the hope of natural enemies to reproduce and multiply.

Inundative Release (2)

This is when a large number of natural enemies are released were there in a small area were pest population is increasing Inorder to suppress the pest which are flooded in a small area.

(2) Techniques of cultural control.

(1) Crop rotation ✓

(2) soil tillage ✓

(3) field sanitation ✓ (5)

(4) Use of trap crops ✓ e.g Marigold

(5) planting/adjusting and harvesting time ✓

NAME : CHAMA INON...
ID : 2016140326

27/29 93%

AGC 3342: TEST 1 (Entomology component)

DURATION: 45 minutes

TOTAL MARKS: 30

INSTRUCTIONS: Answer all questions and illustrate your answers were necessary

SECTION A (10 marks)

1. What body features do all insects have in common?
   a. Three body regions, six legs, wings
   b. Hardened body regions, antennae, compound eyes
   c. Three body regions, antennae, six legs ✓
   d. Hardened skeleton, antennae, wings
2. What are the three groups of insect control methods?
   a. Cultural, environmental, and chemical
   b. Biological, cultural, environmental
   c. Natural enemies, cultural, and pesticides
   d. Chemical, cultural, and biological ✓
3. What are two types of insect mouth parts?
   a. Chewing and sucking ✓
   b. Sucking and slurping
   c. Grinding and tearing
   d. Tearing and siphon

(9)

4. Which two phases is an insect between when it is a larva?
   a. Nymph and adult
   b. Pupa and egg ✗
   c. Larva and pupa
   d. Egg and pupa ✓
5. In which stage are insects identified by instars and molting?
   a. Immatures ✓
   b. Embryos
   c. Adults
   d. Pupa
6. What is molting?
   a. The stage when an insect begins its life as an adult
   b. The stage when an insect emerges from the egg to become an embryo
   c. The shedding of the hard, outer layer of skin between instars ✓
   d. The shedding of the soft, inner layer of skin between instars

19/14

Name: MUSONDA MUKOSHA Comp #: 12028371

AGC 3342: CROP PROTECTION (ENTOMOLOGY SECTION) **Date: May 6, 2015**

1. TRUE/FALSE (1 MARK EACH) (4)

1. Insect sweep net is good for collecting flying insects. True ✓
2. Light traps can be effective method in sampling diurnal insects from the air. false ✓
3. Significant levels of pesticide resistance have now been reported in less than 500 insect species. True ✗
4. Diamondback moth is an accidental introduced pest in Zambia. ~~True~~ false ✗
5. Timely harvesting is a cropping technique for checking the sweet potato weevil. True ✓

2. Multiple choice (1 Mark each) (6)

i. Which of the following is true?
A. All arthropods are insects B. All insects are Crustaceans (C) All insects are Arthropods D. All Crustaceans are insects.

ii. A person Who studies insects is an ?
A. Insectologist B. Entymologist C. Etymologist (D) Entomologist

iii. Which of the following statements is not true about the general characteristics of insects?
A. Insects body is bilateral symmetry (B) Insects have an endoskeleton C. Insects have six jointed legs D. Insects have three main body tagmata

iv. Insects are beneficial to human beings because
A. They act as vectors of diseases and viruses B. They destroy food C. They are contaminants (D) None of the above.

v. Insects are among the most successful arthropods because of the following reasons:
A. Ability to fly B. Have an exo- skeleton C. Have a high reproductive potential (D) All of the above

vi. Which monitoring device would be the best for crawling insects?
A. Sweep net B. Sticky trap (C) Pitfall trap C. light trap.

vii. Which common name is INCORRECTLY written? (A) Horsefly (C) Stonefly
B. Dragonfly D. Sawfly

viii. Pest outbreaks tend to occur when: (A) Crops are planted in monoculture. B. Natural enemies are imported from abroad. C. Farmers switch to new crops. (D) All of these.

ix. Patterns of crop protection have gone through five phases in terms of discovery and use of insecticides which ultimately led to integrated pest management. Which phase below does not belong to stages of crop protection?
(A) Gregarious phase B. Disaster phase (C) Integrated management phase D. Crisis phase.

END OF QUIZ

Name:..[handwritten name]..............Comp #....[handwritten number]..........

AGC 3342: CROP PROTECTION (ENTOMOLOGY SECTION)

1. Define entomology?

2. Insects are classified as belonging to the Phylum Arthropoda. What is the meaning of the word Arthropoda?

3. Name the class to which insects belong.

4. What are the six (6) general characteristics of the insects?

5. Name the three main parts of an insect body.

6. What are the two main groups of insect mouth parts?

7. Which insect order contains the most insect species?

8. All insects are pests? Justify your answer.

9. If you saw an entomological word, Miridae, which you didn't know, you would still absolutely know that it was.........................

10. Which monitoring device would be the best for nocturnal insects?

11. Define Integrated Pest Management?

12. Which insecticide would be more appropriate for sucking insects like aphids?

13. On which insect body do you find insect wings?

14. Name ten (10) insect orders you know.

15. Write five (5) scientific names of any insects you know.

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxEND OF EVALUATIONxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

14.5/29

NAME: JUDITH TIZA MWAFULIRWA COMP. #: 12105481

AGC 3342: CROP PROTECTION (ENTOMOLOGY) TEST DATE: 13th May 2015

Q1. True/False (1 Mark each)

i. An insect that carries a pathogen from one host to another is called a parasite. F ✓
ii. Malathion is an example of an Organochlorine. T ✗
iii. Most parasitoids belong to the orders Hymenoptera and Diptera. T ✓
iv. Organophosphates are characterized by a relatively high degree of environmental persistence. T ✗
v. The destruction by burning of all cotton residues, immediately after harvest, is strongly recommended in order to control the American bollworm. T ✓
vi. Systemic insecticide is the best for controlling an insect with chewing mouth parts. T ✗

3

Q2. Matching (1 mark each)

Use the following key to identify the type of resistance mechanism described in i-v below:

A. Antibiosis B. Antixenosis C. Tolerance

i. Bruchid eggs oviposited on Carioca bean derived mutant, CA38-38-9-B, do not hatch. C ✗
ii. Aphids tend to avoid cotton plants that have hairy leaves. C ✗
iii. Certain bean plants set more adventitious roots when they are damaged by bean stem maggots. B C ✓
iv. Certain groundnut cultivars produce compounds that are toxic to newly hatched leafhoppers. A ✓
v. High photosynthetic efficiency of a soybean cultivar compensates for leaf injury by insects. C ✓

3

Q3. Define the following terms:

a. Insecticide Formulation. Give 2 examples. (3 marks)
b. Economic injury level (1 mark)
c. Gregarious parasitoid (1 mark)
d. Inundative release (1 mark)

Q4. Short answers

a. Distinguish between absolute sampling and relative sampling. (2 marks)
b. Which class of the Phylum Arthropoda is closely related to insects? (1 mark)
c. Write a complete scientific name of any insect you know. (2 marks)
d. Distinguish between foreign quarantine and domestic quarantine. (2 marks)
e. List five (5) ways of classifying a pesticide? (5 marks)

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx END OF TEST xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

14.5/29

NAME: JUDITH TIZA MWAFULIRWA COMP. #: 12105481

AGC 3342: CROP PROTECTION (ENTOMOLOGY) TEST DATE: 13th May 2015

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e. List five (5) ways of classifying a pesticide? (5 marks)

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx END OF TEST xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

8/14

Name: JUDITH TIZA MWAFULILWA Comp #: 12105451

AGC 3342: CROP PROTECTION (ENTOMOLOGY SECTION)

Date: May 6, 2015

1. TRUE/FALSE (1 MARK EACH)

1. Insect sweep net is good for collecting flying insects. F ✗
2. Light traps can be effective method in sampling diurnal insects from the air. T ✗
3. Significant levels of pesticide resistance have now been reported in less than 500 insect species.
4. Diamondback moth is an accidental introduced pest in Zambia. F ✗
5. Timely harvesting is a cropping technique for checking the sweet potato weevil. T ✓

(1)

2. Multiple choice (1 Mark each)

i. Which of the following is true?
A. All arthropods are insects B. All insects are Crustaceans C. All insects are Arthropods D. All Crustaceans are insects

ii. A person Who studies insects is an ?
A. Insectologist B. Entymologist C. Etymologist D. Entomologist

iii. Which of the following statements is not true about the general characteristics of insects?
A. Insects body is bilateral symmetry B. Insects have an endoskeleton C. Insects have six jointed legs D. Insects have three main body tagmata

iv. Insects are beneficial to human beings because
A. They act as vectors of diseases and viruses B. They destroy food C. They are contaminants D. None of the above.

(7)

v. Insects are among the most successful arthropods because of the following reasons:
A. Ability to fly B. Have an exo- skeleton C. Have a high reproductive potential D. All of the above

vi. Which monitoring device would be the best for crawling insects?
A. Sweep net B. Sticky trap C. Pitfall trap C. light trap.

vii. Which common name is INCORRECTLY written? A. Horsefly C. Stonefly B. Dragonfly D. Sawfly

viii. Pest outbreaks tend to occur when: A. Crops are planted in monoculture. B. Natural enemies are imported from abroad. C. Farmers switch to new crops. D. All of these.

ix. Patterns of crop protection have gone through five phases in terms of discovery and use of insecticides which ultimately led to integrated pest management. Which phase below does not belong to stages of crop protection?
A. Gregarious phase B. Disaster phase C. Integrated management phase D. Crisis phase.

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxEND OF QUIZxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

8/14

Name: JUDITH TIZA MWAFULILWA Comp #: 12105461

AGC 3342: CROP PROTECTION (ENTOMOLOGY SECTION)

Date: May 6, 2015

1. TRUE/FALSE (1 MARK EACH)

1. Insect sweep net is good for collecting flying insects. F ✗
2. Light traps can be effective method in sampling diurnal insects from the air. T ✗
3. Significant levels of pesticide resistance have now been reported in less than 500 insect species.
4. Diamondback moth is an accidental introduced pest in Zambia. F ✗
5. Timely harvesting is a cropping technique for checking the sweet potato weevil. T ✓

(1)

2. Multiple choice (1 Mark each)

i. Which of the following is true?
A. All arthropods are insects B. All insects are Crustaceans C. All insects are Arthropods D. All Crustaceans are insects

ii. A person Who studies insects is an ?
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iii. Which of the following statements is not true about the general characteristics of insects?
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xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxEND OF QUIZxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

CamScanner

10/14

Name: MUSONDA MUKESHA   Comp #: 12028371

AGC 3342: CROP PROTECTION (ENTOMOLOGY SECTION)   **Date: May 6, 2015**

1. TRUE/FALSE (1 MARK EACH)

4

1. Insect sweep net is good for collecting flying insects. True ✓
2. Light traps can be effective method in sampling diurnal insects from the air. False ✓
3. Significant levels of pesticide resistance have now been reported in less than 500 insect species. ~~True~~ fa
4. Diamondback moth is an accidental introduced pest in Zambia. ~~True~~ false ✗
5. Timely harvesting is a cropping technique for checking the sweet potato weevil. True ✓

2. Multiple choice (1 Mark each)

6

i. Which of the following is true?
A. All arthropods are insects B. All insects are Crustaceans C. All insects are Arthropods D. All Crustaceans are insects.

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A. Insectologist B. Entymologist C. Etymologist D. Entomologist

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B. Dragonfly D. Sawfly

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xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxEND OF QUIZxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

19/14

Name: MUSONDA MUKESHA Comp #: 12028371

AGC 3342: CROP PROTECTION (ENTOMOLOGY SECTION) **Date: May 6, 2015**

1. TRUE/FALSE (1 MARK EACH)

1. Insect sweep net is good for collecting flying insects. True ✓
2. Light traps can be effective method in sampling diurnal insects from the air. False ✓
3. Significant levels of pesticide resistance have now been reported in less than 500 insect species. ~~True~~ fa
4. Diamondback moth is an accidental introduced pest in Zambia. ~~True~~ false ✗
5. Timely harvesting is a cropping technique for checking the sweet potato weevil. True ✓

(4)

2. Multiple choice (1 Mark each)

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vii. Which common name is INCORRECTLY written? (A.) Horsefly ~~(C.)~~ Stonefly
B. Dragonfly D. Sawfly

viii. Pest outbreaks tend to occur when: (A.) Crops are planted in monoculture. B. Natural enemies are imported from abroad. C. Farmers switch to new crops. ~~(D.)~~ All of these.

ix. Patterns of crop protection have gone through five phases in terms of discovery and use of insecticides which ultimately led to integrated pest management. Which phase below does not belong to stages of crop protection?
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xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxEND OF QUIZxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

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

AGC 3342: TEST 3

TIME: 2 hours

MARKS: 30 Marks

INSTRUCTIONS: Answer all questions and provide examples were necessary.

1. Summarise the following:
   a) Direct crop losses caused by weeds (5) ✓
   b) Measures in preventive weed control (5) ✓
2. Describe the following:
   a) Microbial Control of Weeds (5) ✓
   b) Reasops for popularity of Chemical Weed Control (6) ✓
   c) Classification of herbicides by "type of selectivity" (4) ✓
   d) Reasons why Integrated Weed Management (IWM) is desirable (5) ✓

END OF TEST

Chief

Name: Shane Mpoha Queen Comp #: 12692432

GC 3102: CROP PROTECTION (ENTOMOLOGY SECTION) Date: June 4, 2014

1. Multiple choice (1 Mark each)

i. What is entomology?

A. Science of controlling insects B. Science of studying arthropods ~~C~~. Science of studying insects D. Science of insect collection.

ii. Which of the following statements is not true about the general characteristics of insects?

A. Insects body is bilateral symmetry ~~B~~. Insects have an endoskeleton C. Insects have six jointed legs D. Insects have three main body tagmata

iii. Insects are beneficial to human beings because

A. They act as vectors of diseases and viruses B. They destroy food C. They are contaminants ~~D~~. None of the above.

iv. Adult beetles are characterized by the presence of

~~A~~. Hardened front wings called elytra B. Presence of hemelytra C. sucking mouth parts D. incomplete metamorphosis.

v. Patterns of crop protection have gone through five phases in terms of discovery and use of insecticides which ultimately led to integrated pest management. Which phase below does not belong to stages of crop protection?

A. Crisis phase B. Disaster phase C. Integrated control phase ~~D~~. Gregarious phase

vi. Insects are among the most successful arthropods because of the following reasons.

A. Ability to fly B. Have an exo- skeleton C. Have a high reproductive potential ~~D~~. All of the above

vii. Which insect orders contain species that are important bio-control agents?

~~A~~. Siphonaptera and Coleoptera B. Homoptera and Hemiptera C. Diptera and Hymenoptera D. All of these

viii. If you saw an entomological word, Miridae, which you didn't know, you would still absolutely know that it was:

A. an order of an insect ~~B~~. a family of an insect C. a super family of an insect D. indeterminable from the manner it is written.

ix. Which of the following order contains the most insect species? A. moths and butterflies (Lepidoptera) B. Thrips (Thysanoptera) ~~C~~. beetles (Coleoptera) D. True flies (Diptera).

x. Which monitoring device would be the best for crawling insects?

A. Sweep net B. Sticky trap ~~C~~. Pitfall trap C. Malaise trap.

xi. Which of these is a cultural method for controlling insects?

~~A~~. Crop rotation B. Quarantine C. Window screens D. Sex pheromone traps

me: Sitate Mpoha Queen Comp #: 12692432

CC 3102: CROP PROTECTION (ENTOMOLOGY SECTION) Date: June 4, 2014

1. Multiple choice (1 Mark each)

i. What is entomology?

A. Science of controlling insects B. Science of studying arthropods C. Science of studying insects D. Science of insect collection.

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THE UNIVERSITY OF ZAMBIA

SCHOOL OF AGRICULTURAL SCIENCES

DEPARTMENT OF PLANT SCIENCE

Third Year Examination for Bachelor of Agricultural Sciences

AGC 3342: Crop Protection

2013/14 Final Examination

Date: 16th July, 2014 **Time: 09:00 – 12:00 hrs** **Venue: GLT**

Instructions:

- There are three (3) sections in this Examination Paper
- Each section should be answered in a **separate answer booklet**
- Answer **Any Two (2)** question from Section A and **Both (2)** questions from Section B and C
- You are required to answer a total of 5 questions

SECTION A (20 MARKS): PATHOLOGY- ANSWER ANY TWO QUESTIONS

Question 1

a) Describe how Witchweed (*Striga spp*) causes parasitism in higher plants, clearly highlighting the mechanisms used. **(6 marks)**

b) Explain ways in which viruses can be transmitted in plants. **(4 marks)**

Question 2

a) Illustrating with appropriate examples, discuss any four shapes associated with particle morphology classification in viruses. **(6 marks)**

b) Explain any four factors that accounts for the success of the plant pathogenic fungi **(4 marks)**

Question 3

a. Explain the differences between a sign and a symptom with reference to plant disease diagnosis. **(3 marks)**

b. Explain how nematodes cause diseases and list symptoms associated with nematode attack or invasion on plants **(5 marks)**

c. List four (4) symptoms associated with non-infectious disorders in plants. **(2 marks)**

SECTION B (20 MARKS): ENTOMOLOGY- ANSWER BOTH QUESTIONS

Question 4

We seldom stop to consider what life would be like without insects and how much we depend on them for our very survival. Discuss the benefits of insects, if any. Give relevant examples **(10 marks)**

Question 5

Define Integrated Pest Management (IPM). Suppose a farmer has adopted Integrated Pest Management programme for the insect damaging his/her crop. Explain the requirements for a successful Integrated Pest Management programme **(10 marks)**

SECTION C (20 MARKS): WEED SCIENCE- ANSWER BOTH QUESTIONS

Question 6

What is cultural control of weeds? Describe three (3) measures that constitute preventive weed control. **(10 marks)**

Question 7

a) What are the major factors determining the proliferation of aquatic weeds? **(5 marks)**

b) Give the major differences between weed control and eradication? What are ruderal weeds, give two (2) examples of such weeds (scientific names)? **(5 marks)**

END OF EXAMINATION

xii. Which class of chemical insecticides is characterized by a relatively high degree of environmental persistence? A. Carbamates B. Organophosphates C. Synthetic pyrethroids D. Chlorinated hydrocarbons.

xiii. Compared to first generation pesticides, the newer second and third generation compounds are:

A. More selective and less persistent. B. More toxic and less selective. C. More persistent and less selective. D. None of these.

xiv. Which common name is INCORRECTLY written? A. Horsefly C. Stonefly B. Dragonfly D. Sawfly

xv. Pest outbreaks tend to occur when: A. Crops are planted in monoculture. B. Natural enemies are imported from abroad. C. Farmers switch to new crops. D. All of these.

2. Identification of insects is one of the necessary skills that an entomologist should acquire

i. Discuss the complications associated with insect identification. (4 Marks)
ii. List six ways in which one may identify an unknown insect. (6 Marks)
iii. Insects belong to the Phylum__________________and Class__________________ (2 Marks)
iv. Name the part of the insect body where the wings are attached in winged insects____________________(1 mark)
v. Which order of insects where control of insect pests by sex pheromones has been the most developed? (1 mark). ____________________

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxEND OF TESTxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

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xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxEND OF TESTxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx