GWANDA STATE UNIVERSITY

FACULTY OF NATURAL RESOURCES MANAGEMENT & AGRICULTURE

DEPARTMENT OF HORTICULTURE & CROP PRODUCTION

BACHELOR OF SCIENCE (HONOURS) DEGREE IN HORTICULTURE AND CROP PRODUCTION

NHC2204 BIOLOGY AND MANAGEMENT OF PLANT PESTS

MAIN EXAMINATION PAPER

APRIL 2025

This examination paper consists of 3 pages, inclusive of cover page

Time Allowed: **3 hours**

Total Marks: **100**

Examiner's Name:

INSTRUCTIONS

a) Answer **ALL** questions in Section A

b) Answer ONLY **THREE** questions in Section B

MARK ALLOCATION

QUESTION	**MARKS**
SECTION A	**40**
SECTION B	**60**
TOTAL ATTAINABLE MARKS	**100**

SECTION A: ***ANSWER ALL QUESTIONS***

Question 1.

a) Explain the life cycle of the African armyworm *Spodoptera exempta* **(5)**
b) Assess the potential economic impact of African armyworm infestations on smallholder farmers. **(5)**
c) Analyse the factors contributing to the rapid spread of the African armyworm *Spodoptera exempta* in sub-Saharan Africa. **(5)**
d) Given a scenario where an outbreak of African armyworms occurs, what immediate steps should a farmer take to mitigate the damage? **(5)**

Question 2

a) Distinguish between harmful and beneficial insect setting the contribution of the two categories of insects to crop production. **[10]**

b) It is believed that there cannot be life on earth without pollinating insects. Link the roles of pollinating insects and their significance in Crop production. **[10]**

SECTION B: ***ANSWER THREE QUESTIONS***

Question 3.

a) Set forth the general characteristics of the three body parts (Head, thorax and abdomen) of an insect **[15]**

b) Describe **FIVE** appendages that are found on the insect head. **[5]**

Question 4.

a) Distinguish the Fall army worm from any one stem borer indicating their; scientific name, common name, order, and family**.** **[4]**

b) Describe the biology and behaviour of the Fall army worm under the following headings;

i. Hosts **[2]**
ii. Pest status **[2]**
iii. Damage **[4]**
iv. Life cycle **[3]**
v. Distribution **[1]**
vi. Control **[4]**

Question 5

Discuss, giving suitable examples, the following major groups of insecticides: organochlorines, organophosphates, carbamates and pyrethrins. **[20]**

Question 6

a) Using a real-world example, demonstrate how physical pest management methods can be integrated into an IPM plan. **(10)**
b) Critically assess the potential risks and benefits of using genetically modified plants for pest resistance. **(10)**

Question 7

The use of chemicals to control insect pests is an evolving war with insects developing ways to survive chemical sprays. Discuss insect resistance, highlighting its causes, factors affecting its development, mechanisms and how it can be managed. **[20]**

END OF EXAMINATION