



# MACHAKOS UNIVERSITY

University Examinations for 2019/2020 Academic Year

SCHOOL OF AGRICULTURAL SCIENCES

DEPARTMENT OF AGRICULTURAL EDUCATION AND EXTENSION

THIRD YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE IN AGRICULTURAL EDUCATION AND EXTENSION

KST 301: AGRICULTURAL ENTOMOLOGY

DATE: 12/11/2020

TIME: 8.30-10.30 AM

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## INSTRUCTIONS:

Answer *ALL* questions from Section A and any other *TWO* from Section B:

**SECTION A: COMPULSORY: (30 MARKS)**

### QUESTION ONE (30 MARKS)

- a) Explain the importance of insect functional morphology between crickets and wasps (4 marks)
- b) Explain THREE uses of insect life-tables data (6 marks)
- c)
  - (i) Differentiate between exponential and logistic growth curves of insect populations (4 marks)
  - (ii) Describe how the two growth types are used to calculate insect density at specified time of growth (4 marks)
- d) Describe types egg development types in insect reproduction (6 marks)
- e)
  - i. Name and describe the difference between THREE pest types in maize crop production (3 marks)
  - ii. Name and explain how THREE beneficial insects found in crop production differ from pests types (3 marks)

**SECTION B: ANSWER ANY TWO QUESTIONS (40 MARKS)**

**QUESTION TWO (20 MARKS)**

- a) Giving TWO examples of insect species under Complete and another TWO in Incomplete metamorphosis, graphically show how life stage cohorts of each species occur (8 marks)
- b) Explain the difference of the life stages of Complete and Incomplete metamorphosis insects giving THREE examples of the species for each group (12 marks)

**QUESTION THREE (20 MARKS)**

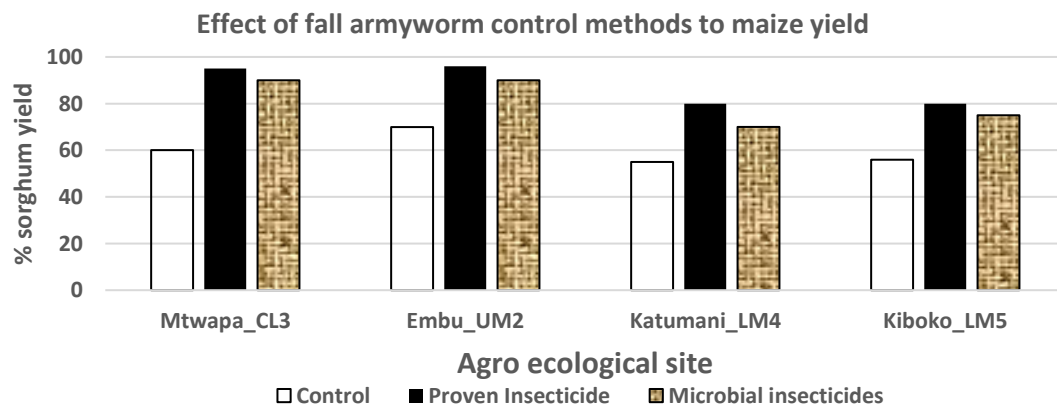
- a) Describe FIVE methods of controlling pests in crop production systems (10 marks)
- b) Explain TWO advantages of each of pest management options described in (a) above. (10 marks)

**QUESTION FOUR (20 MARKS)**

- a) Explain the importance of pest assessment in integrated pest management systems (8 marks)
- b) Describe the taxonomic difference of FOUR main insect Orders of economic importance in crop production. (12 marks)
- c) Explain the various roles of prothoracicotropic hormone (PTTH) in insect molting process (10 marks)

**QUESTION FIVE (20 MARKS)**

- a) Sorghum crop production is constrained by fall armyworm pest in varied agro ecological zones. (i) Study **Figure 1** below and analyse the effect of Proven and biocide insecticides in the four production sites namely; Katumani, Embu, Mtwapa and Kiboko. (12 marks)



**Figure 1:** Fall armyworm effect to sorghum crop yield under treatments of insecticides and environmental factors

- b) Explain FOUR environmental factors that could have led to highest sorghum yield loss in Kiboko than Embu. (8 marks)