

2404/305
ANIMAL AND PLANT HUSBANDRY,
PHARMACOLOGY, TOXICOLOGY,
ENTOMOLOGY AND PLANT PATHOLOGY
Oct./Nov. 2016
Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN APPLIED BIOLOGY

ANIMAL AND PLANT HUSBANDRY, PHARMACOLOGY,
TOXICOLOGY, ENTOMOLOGY AND PLANT PATHOLOGY

3 hours

INSTRUCTIONS TO CANDIDATES

You should have an answer booklet for this examination.

*This paper consists of **TWO** sections: **A** and **B**.*

*Answer **ALL** the questions in section **A** and **THREE** questions from section **B**.*

*Each question in Section **A** carries 4 marks while each question in Section **B** carries 20 marks.*

Maximum marks for each part of a question are indicated.

Candidates should answer the questions in English.

This paper consists of 3 printed pages.

**Candidates should check the question paper to ascertain that
all the pages are printed as indicated and that no questions are missing.**

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SECTION A (40 marks)

Answer ALL the questions in this section.

1. (a) Define the term crop rotation. *- growing crops in alternates* (1 mark)
- (b) State **three** factors that must be considered if cultivation is to be a successful pest control method. *- Germination percentage for sowing
- Adequate seed purity
- Testa texture* (3 marks)
2. State **two** advantages and **two** disadvantages of using polyethylene material for green house covering. *Adv: - maximum light
- Air trap to increase temp
Dis: - Non-biodegradable
- easily tear and wear* (4 marks)
3. Distinguish between:
 - (a) Certified seed and foundation seed. *- germination and purity have been established.* (2 marks)
 - (b) Blight and blotch. *- white lesions due to virus/swelling.
- black spot due to fungi* (2 marks)
4. Identify **four** possible reasons for the success of insects. *- High reproduction rate
- metamorphosis
- flight and visual acuity
- small body* (4 marks)
5. State any **four** factors to consider when choosing a suitable humane killing method. *- size of species
- type of operation required* (4 marks)
6. Give the uses of earthworms as laboratory animals. *- improve soil texture
- decomposition
- monitor respiration* (4 marks)
7. Match the insects in column A with respective orders in column B.

Column A	Column B
Dragonfly	Coleoptera <i>- beetle</i>
Cricket	Odonata <i>- dragon</i>
Beetle	Siphonaptera <i>- flea</i>
Flea	Orthoptera <i>- cricket</i>

8. (a) Define the term biotrope. (1 mark)
- (b) State the effect of the following enzymes secreted by plant pathogens:
 - (i) Pectinase. *- sugars* (1 mark)
 - (ii) Cellulase. *- cellulose coating* (1 mark)
 - (iii) Ligninase. *- fibre formation* (1 mark)

9. State **four** principles of drug action. *- cell wall synthesis
- protein synthesis
- folic acid synthesis
- hammering cell* (4 marks)

10. Explain the toxicity of sulphur dioxide. *SO₂ → combine with H₂O → sulphurous acid.
↓
irritation of membrane.
↓
secrete mucus
Dyscratic* (4 marks)

*Absorption
- Distribution
- Bio-transformation*

SECTION B (60 marks)

Answer any **THREE** questions from this section.

11. (a) Describe the characteristics of incomplete or partial metamorphosis. (8 marks)

(b) Explain the **two** basic types of parthenogenesis in insects. Give illustrations of their life cycles. (12 marks)

12. (a) Draw a labelled diagram of an ommatidium. (8 marks)

(b) Differentiate between:

(i) Transpiration and guttation (4 marks)

(ii) Row planting and broadcasting. (8 marks)

13. (a) Describe the sexing of guinea pigs. (10 marks)

(b) List the advantages and disadvantages of the Harem system of breeding. (10 marks)

14. Explain the classification of drug antagonists based on mechanisms of action. (20 marks)

15. (a) Explain the chronic toxicity effects of lead on:

(i) Gastro intestinal tract (6 marks)

(ii) Skeletal muscles. (6 marks)

(b) Explain the effect of pH on drug absorption. (8 marks)

Handwritten notes:
 - physical inhibition
 - chemical inhibition
 - Enzyme inhibition
 - lipid non-soluble, ionised & adsorbed to surface
 - Hold at the clean surface
 - support the weight
 - suspend it at a non-slip surface
 - other person looks the reproductive part
 - pins - male the genitalia
 - size water in the egg
 - albumen animal to the egg
 - only lipid non-soluble
 - degree of ionisation
 - HCl → H⁺
 - Dis-negentative ions
 - Ads

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