

2404/305  
ANIMAL AND PLANT HUSBANDRY,  
PHARMACOLOGY, TOXICOLOGY,  
ENTOMOLOGY AND PLANT PATHOLOGY  
Oct./Nov. 2017  
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 the following for this examination:*

*Answer booklet;*

*Non-programmable scientific calculator.*

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

*Answer ALL the questions in section A and any 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 question paper consists of 3 printed pages.**

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

**SECTION A (40 marks)**

*Answer ALL the questions in this section.*

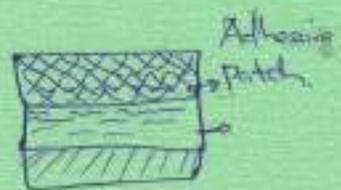
1. (a) Define the term seed dormancy. (1 mark)  
(b) State **three** ways in which the seed coat causes seed dormancy. (3 marks)
2. (a) Define the term pest. (1 mark)  
(b) State **three** ways by which insects cause plant pathogen to enter the plant. (3 marks)
3. Distinguish between:  
(a) clonal variety and line variety in plant breeding. (2 marks)  
(b) Mutual pollination and Approach pollination. (2 marks)
4. (a) Define the term seed certification. (1 mark)  
(b) State the importance of seed certification. (3 marks)
5. List the factors to be considered in the choice of a suitable humane killing method. (4 marks)
6. State the disadvantages of hand-matings systems in laboratory animals. (4 marks)
7. Define the terms:  
(a) pro-drug reaction;  
(b) adverse drug reaction. (4 marks)
8. With the aid of a diagram, illustrate the Transdermal device in relation to drug administration. (4 marks)
9. (a) Describe the mode of action of mercury poisoning. (2 marks)  
(b) Calculate the standard safety margin of a drug whose effective dose in 99% of subjects ( $ED_{99}$ ) is 150 and the dose which is lethal to 1% of the subjects ( $LD_1$ ) is 200. (2 marks)
10. (a) Distinguish between drug dependence and drug tolerance. (2 marks)  
(b) Name **two** sites at which drug absorption can taken place. (2 marks)

SECTION B (60 marks)

Answer any THREE questions from this section.

11. (a) Describe the:
- (i) behaviour of laboratory mice. (5 marks)
  - (ii) proper way of carrying a rabbit. (8 marks)
- (b) (i) Distinguish between forages and concentrates. (2 marks)
- (ii) State the conditions in which a licence is given to use animals for experimental purposes. (5 marks)
12. (a) Explain the toxicity of Kerosene. (10 marks)
- (b) (i) Describe the effects of acute lead poisoning. (5 marks)
- (ii) Explain the treatment employed for b (i) above. (5 marks)
13. (a) (i) Define the term median lethal dose. (2 marks)
- (ii) State the aims of chronic toxicity studies. (6 marks)
- (b) Explain the mechanisms of drug action. (12 marks)
14. (a) Describe the methods used to break seed dormancy. (10 marks)
- (b) Explain how the following factors cause non-infectious diseases to plants:
- (i) temperature; (5 marks)
  - (ii) moisture. (5 marks)
15. Describe the adaptations of the basic pattern of the insect leg in relation to any four physiological activities. (20 marks)

Methods to break dormancy  
- Boiling  
- Soaking  
- Dry  
- Cold



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