

2404/301
TAXONOMY, ECOLOGY, SOIL STUDY,
HERBARIUM, AQUARIUM AND
VIVARIUM
Oct./Nov. 2016
Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN APPLIED BIOLOGY

TAXONOMY, ECOLOGY, SOIL STUDY, HERBARIUM,
AQUARIUM AND VIVARIUM

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 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 paper consists of 3 printed pages.

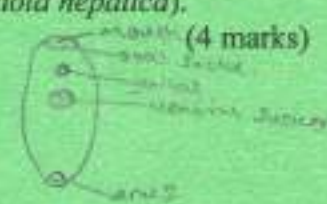
**Candidates should check the question paper to ascertain that
all the pages are printed as indicated and that no questions are missing.**

SECTION A (40 marks)

Answer ALL the questions in this section.

1. Identify the general characteristics of the phylum *Filicinophyta* (ferns). (4 marks)

2. Draw a labelled diagram of the external features of the liver fluke (*Fasciola hepatica*). (4 marks)



3. The table I shows daily energy requirements for human and small bird.

Table I

Human	167 KJ
Small bird	4186 KJ

Account for the large difference in daily energy requirements for humans and small birds.

(4 marks)

4. Distinguish between intraspecific and interspecific competition. Give specific examples.

(4 marks)

5. Explain the influence of rainfall in soil formation.

(4 marks)

6. (a) Define the term 'cation exchange' as used in soil chemistry.

(2 marks)

(b) State the importance of cation exchange capacity of a soil.

(2 marks)

7. (a) Name any two common herbarium pests.

(2 marks)

(b) Describe the pest management in a herbarium.

(2 marks)

8. Outline the procedure for degreasing bones by use of ammonia.

(4 marks)

9. Explain the importance of live plants in an aquarium.

(4 marks)

10. (a) Define the term vivarium.

(2 marks)

(b) Identify any two methods through which humidity in a vivarium can be controlled.

(2 marks)

have to be inhabited by organisms that require both dry & moist environment like amphibians.

SECTION B (60 marks)

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

- ✓11. Differentiate between gymnosperms and angiosperms. (20 marks)
Plants with seed without fruit
- ✓12. (a) Describe the concept of couplets in construction of a dichotomous key. (8 marks)
more couplets
- (b) Differentiate between centipedes and millipedes. (12 marks)
3 body divisions, 2 pairs of legs, - hexapoda
- ✓13. Describe how natural communities come into being, develop and endure. (20 marks)
- ✓14. (a) Explain how the physico-chemical environment varies as one move along an estuary from river to sea. (10 marks)
from source - middle - mouth
- (b) Outline how the changes in (a) above influence the pattern of organism distribution within the estuary. (10 marks)
15. (a) Define each of the following terms, as used in soil water. (8 marks)
- Field capacity;
 - Gravitational water;
 - Water holding capacity;
 - Plant available water.
- (b) Describe the disadvantages of the use of saline water for irrigation purpose. (7 marks)
- (c) Explain how moderately saline water may be used for irrigation. (5 marks)

genes - cells - tissues - organs -> organism -> population -> community -> ecosystem -> biosphere

Dichotomous Key

- use the major veins first
- use contrasting statements
- use observable features

eg. wings, feathers, limbs, antennae etc

Centipedes	Millipedes
<ul style="list-style-type: none"> 1 - Class Chilopoda 2 - dorsal ventrally flattened 3 - herbivores 4 - few segments 5 - one pair of legs per segment 6 - 2 body division 	<ul style="list-style-type: none"> 1 - Class diplopoda 2 - cylindrical bodies 3 - carnivores 4 - many segments 5 - 2 pairs of legs per segment 6 - 3 body division

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Gymnosperms	Angiosperms
<ul style="list-style-type: none"> - consist of cones - not flowering 	<ul style="list-style-type: none"> - consist of dicots and monocots - are flowering