



FACULTY OF SCIENCE

DEPARTMENT OF BOTANY and PLANT BIOTECHNOLOGY

MODULE	ADVANCED PLANT TAXONOMY AND ECONOMIC BOTANY BOT0097
CAMPUS	APK
EXAMINATION	JANUARY 2017

DATE
10/January/2017

SESSION
11:30 – 14:30

EXAMINER:

PROF A. MOTEETEE

INTERNAL MODERATOR:

PROF M. VAN DER BANK

EXTERNAL EXAMINER:
DURATION: 3 HOURS

DR. J.S. BOATWRIGHT
MARKS: 150

NUMBER OF PAGES: 4 PAGES

INSTRUCTIONS: ANSWER ALL THE QUESTIONS

QUESTION 1

[70]

1.1 Discuss how the following characters can be used for taxonomic purposes.

- 1.1.1 Cytology (10)
- 1.1.2 Proteins (15)
- 1.1.3 Macromorphology (20)

1.2 Discuss how megasporogenesis and megagametogenesis in flowering plants lead to several types of embryo sacs. (7)

- 1.3 Which anther anatomy characters are of taxonomic value? (6 x ½ = 3)
- 1.4 Briefly discuss the different types of secondary metabolites used for taxonomic purposes. (15)

QUESTION 2

[40]

- 2.1 Name two important aspects of Albertus Magnus' classification system that are still applicable to date. (2)
- 2.2 In which genera are the following famous herbalists commemorated? (3)
- 2.2.1 Otto Brunfels
- 2.2.2 Leonhart Fuchs
- 2.2.3 Mathias de L'Obel
- 2.3 Which botanist is often regarded as the first true taxonomist and why? (4)
- 2.4 Discuss Linnaeus' sexual system of classification. (3)
- 2.5 Linnaeus' sexual classification system was criticized for being artificial, especially in France. Which four French botanists attempted to develop natural classification systems as a result? (4)
- 2.6 Name any three organisms that have names which commemorate Carl Linnaeus. (3)
- 2.7 Who was the first American botanist to make an important contribution to plant classification? On what basis did he develop his classification system? (3)
- 2.8 Why were the Salicaceae regarded as primitive and the Asteraceae as advanced by Adolf Engler and Karl Prantl? (2)
- 2.9 What are the advantages of cladistics? (5)
- 2.10 Which steps are followed in the process of phenetic classification? (6)
- 2.11 Define the following terms: (5)
- 2.11.1 Monophyletic
- 2.11.2 Paraphyletic
- 2.11.3 Reversal

- 2.11.4 Convergence
- 2.11.5 Homoplasy

QUESTION 3

[30]

- 3.1 What are the six (6) principles of the International Code of Nomenclature for Algae, Fungi, and Plants? (6)
- 3.2 What are the advantages of using scientific names over common names? (5)
- 3.3 Discuss three main rules to be followed when constructing specific epithets which commemorate persons. (4)
- 3.4 What are the alternative names for the following conserved family names? (4)
 - 3.4.1 Compositae
 - 3.4.2 Labiatae
 - 3.4.3 Guttiferae
 - 3.4.4 Umbelliferae
- 3.5 Explain the author citations in the following plant names: (3)
 - 3.5.1 *Buxus natalensis* (Oliv.) Hutch.
 - 3.5.2 *Olea europaea* L. subsp. *africana* (Mill.) P.S. Green
 - 3.5.3 *Virgillia* Poir. in Lam.
- 3.6 Provide possible specific epithets for the plants described below: (4)
 - 3.6.1 *Oxalis* with purple flowers
 - 3.6.2 *Carissa* with large fruits
 - 3.6.3 A tree-like *Aloe*
 - 3.6.4 The edible *Carpobrotus*
- 3.7 When is a name regarded to be validly published? (4)

QUESTION 4

[10]

- 4.1 Discuss the works of William Henry Harvey and his contribution to South African plant collection. (5)

4.2 Based on the numbers of specimens, which are the five largest herbaria in the world?
(5)