



**NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY**

FACULTY OF HEALTH, NATURAL RESOURCES AND APPLIED SCIENCES

DEPARTMENT OF NATURAL RESOURCES SCIENCES

QUALIFICATION: BACHELOR OF NATURAL RESOURCES MANAGEMENT	
QUALIFICATION CODE: 07BNRS	LEVEL: 7
COURSE CODE: PTS710S	COURSE NAME: Plant Studies 2
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DURATION: 2 HOURS	MARKS: 100

FIRST OPPORTUNITY EXAMINATION QUESTION PAPER	
EXAMINER(S)	Prof. J. M. Kamwi
MODERATOR:	Prof. E. Kwembeya

INSTRUCTIONS
1. Answer ALL the questions. 2. Write clearly and neatly. 3. Number the answers clearly.

PERMISSIBLE MATERIALS

1. Examination question paper
2. Answering book

THIS QUESTION PAPER CONSISTS OF 3 PAGES (Excluding this front page)

1. Plant taxa are classified hierarchically by rank, in which a higher rank is inclusive of all lower ranks. A family may consist of several genera, each having a unique variation of the characteristic(s) that set them apart. Additionally, a genera may consist of several species, each with a unique variation of the defining trait.
 - 1.1 Give an example of this within the family Combretaceae. [4]
 - 1.2 Contrast the leaf arrangements of the two Combretaceae genera studied. [2]
2. Why do angiosperms have such a wide variety of secondary metabolites? [2]
3. Describe the process by which plants and their predators co-evolve. [2]
4. Describe the terms of the material transfer agreement (MTA) that the NBRI is bound by. [2]
5. What does the term herbaria mean? [2]
6. What is the National Botanical Research Institute (NBRI)'s mission? [2]
7. Explain the functions of National Plant Genetic Resources Center at the NBRI [2]
8. The samara of the genus *Terminalia* are distinguished by having a single wing circling the seed. It goes without saying that other species that do not belong to *Terminalia* possess this trait. Mention a species of that kind and name its substrate. [2]

9. Column A's taxonomy is useful for a variety of purposes. From the list in column B, select the use that is most crucial. NB: You may pick "no use" in column B more than once. For example (1); D, write down the number from column A and the matching letter from column B. [6]

Column A - taxon	Column B – important use
(1) <i>Colophospermum mopane</i>	A. Aromatic resin
(2) <i>Combretum apiculatum</i>	B. Browse for giraffe
(3) <i>Burkea africana</i>	C. Tanning leather
(4) <i>Boscia albitrunca</i>	D. Browse for kudu
(5) <i>Elephantorrhiza suffruticosa</i>	E. Timber
(6) <i>Commiphora wildii</i>	F. Fire wood

10. Provide the species families listed in question 9 (paying close attention to spelling). Together with the family name, write the number from column A. [6]

11. Sort the species listed below into their appropriate subfamilies. Note the corresponding letter from column B and the number from column A. [18]
REMEMBER: A subfamily may contain many species.

COLUMN A - SUBFAMILY	COLUMN B - SPECIES
(1) Mimosoideae	A. <i>Pterocarpus angolensis</i>
(2) Caesalpinioideae	B. <i>Philenoptera violacea</i>
(3) Papilionoideae	C. <i>Mundulea sericea</i>
	D. <i>Guibourtia coleosperma</i>

	<i>E. Erythrina decora</i>
	<i>F. Abrus precatorius</i>
	<i>G. Colophospermum mopane</i>
	<i>H. Peltophorum africanum</i>
	<i>H. Baphia massaiensis</i>
	<i>J. Baikiaea plurijuga</i>
	<i>K. Burkea africana</i>
	<i>L. Elephantorrhiza suffruticosa</i>
	<i>M. Albizia anthelmintica</i>
	<i>N. Dichrostachys cinerea</i>
	<i>O. Faidherbia albida</i>
	<i>P. Acacia reficiens</i>
	<i>Q. Acacia luederitzii</i>
	<i>R. Erythrophleum africanum</i>

12. Distinguish a petiole from a petiolule? [2]
13. Which two characteristics enable angiosperms to dominate over other plant species in the majority of terrestrial ecosystems? [2]
14. The following characteristics are typical of some of the most important grass species in Namibia. Identify the species and indicate the grazing value of the grass species e.g. decreaser or increaser. [4]
- a. Description
Soft, tufted perennial, with oblique, creeping rhizome and dense basal leaf-cover. Culms erect, slender, unbranched, with one node, up to 0.9 m high. Leaf blade often pinkish or purplish, concentrated at base of plant, tapering to sharp, pointed tip, strongly curled when dry, with or without long, soft hairs. Ligule a fringe of short hairs. Leaf sheath striate, with or without hairs, somewhat squarish in cross-section. Inflorescence a stiff, inflexible, open or slightly contracted panicle, 50-250 mm long, only slightly branched.
Spikelets up to 20 mm long, strongly flattened, may be an even width throughout or pointed, pale green or dark olive-green.
- b. Description
Loosely tufted annual. Culms usually geniculate to decumbent, often rooting at lower nodes, up to 400 mm high. Leaf blade flat, clasping at base, short, up to 60 x 4 mm; margin with evenly spaced bristly hairs. Ligule membranous, margin hairy. Leaf sheath rounded, smooth. Inflorescence a loosely spike-like raceme, up to 70 mm long, often enclosed by upper leaf sheath near base.
Spikelets covered with hooked barbs, densely clustered, on short stalks. 3.5-5 mm long, falling readily when mature, with a tendency to attached to clothes and fur.
15. Describe the stems and tendrils of the members of the Cucurbitaceae family.. [1]
16. It is common for non-plant experts to mistakenly refer to a certain plant's flowers [4]

when, in reality, they are referring to the entire inflorescence. Describe how a flower and an inflorescence differ.

17. The calyx of the majority of Ebenaceae members is permanent. Use two genera of this family in Namibia and discuss this statement. [4]
18. Use the given descriptions to provide the following information about each species: (a) scientific name; (b) family; (c) economic significance in Namibia; and (d) distribution within the country. Extra credit for using common names.
- 18.1 Large, beautiful, deciduous tree that reaches a height of 10 to 18 meters, and occasionally much higher, with a dense, spreading crown, imparipinately compound leaves, male and female flowers on different trees, and edible, spherical, tough-skinned fruit that is pale creamy yellow when ripe. [4]
- 18.2 A tree that can grow up to 12 meters high and has a rounded crown. It has simple leaves that are arranged in a spiral or alternate pattern. When the fruit ripens, it resembles an ovoid-oblong berry and is very juicy and yellow in color. [4]
- 18.3 Small tree or shrub with a V form, 2-3 pairs of bipinnately compound leaves, 1-2 leaflets per pinna, leaflets measuring 10 x 5 mm, sharply curled paired thorns at nodes, round, creamy white heads of flowers, and white lenticels on the bark. [4]
19. Give one word / term for the following: [5]
- The place responsible for storing and preserving dried plants
 - The father of modern taxonomy
 - The arrangement of organisms from most primitive to most advanced
 - The very first specimen described of any taxon
 - The ministry responsible for protecting forests in Namibia
20. The following plant species are all very representative of a certain type of vegetation found in Namibia. Identify the type of plant that each is found in. [4]
- Acacia hereroensis*
 - Acanthosicyos horridus*
 - Pterocarpus angolensis*
 - Spirostachys africana*
21. Explain the fruit, inflorescence, and leaves for each of the following. [12]
- Maerua juncea*
 - Ozoroa paniculosa*
 - Searsia lancea*
 - Combretum hereroensis*