



**NAMIBIA UNIVERSITY  
OF SCIENCE AND TECHNOLOGY**

**Faculty of Health, Applied Science and Natural Resources**

DEPARTMENT OF AGRICULTURE AND NATURAL RESOURCES SCIENCES

<b>QUALIFICATION: BACHELOR OF NATURAL RESOURCES MANAGEMENT (NATURE CONSERVATION)</b>	
<b>QUALIFICATION CODE: 07BNTC</b>	<b>LEVEL: 7</b>
<b>COURSE CODE: WWR711S</b>	<b>COURSE NAME: Water and Wetland Resources Management</b>
<b>DATE: June 2022</b>	<b>SESSION: June</b>
<b>DURATION: 3 HOURS</b>	<b>MARKS: 150</b>

<b>FIRST OPPORTUNITY EXAMINATION QUESTION PAPER</b>	
<b>EXAMINER(S)</b>	Mr R. Kavari
<b>MODERATOR:</b>	Mrs. N. Nashipili

<b>INSTRUCTIONS</b>
<ol style="list-style-type: none"><li>1. Answer ALL the questions.</li><li>2. Write clearly and neatly.</li><li>3. Number the answers clearly.</li></ol>

**PERMISSIBLE MATERIALS**

1. Examination question paper
2. Answering book

**THIS QUESTION PAPER CONSISTS OF 4 PAGES (Including this front page)**

**QUESTION 1 Terminology**

Define the following terminologies, using realistic examples from Namibia or Southern Africa:

- 1.1 Integrated Water Resources Management (2)
  - 1.2 Wetlands (2)
  - 1.3 Flood dynamics (2)
  - 1.4 Water desalination (2)
  - 1.5 Estuarine wetland (2)
  - 1.6 Linear Oasis (2)
  - 1.7 Endoreic river (2)
  - 1.8 Catchment (2)
  - 1.9 Hypogean groundwater (2)
  - 1.10 Impoundment (2)
- [20]**

**QUESTION 2 Namibia`s Water Resources**

- 2.1 Explain why it is imperative to manage water and wetland resources in a country such as Namibia. (5)
  - 2.2 You are part of Namibia`s delegate to a WaterNet 23<sup>rd</sup> Symposium, the topic of your presentation is "Namibia`s progress in Water and Wetland Resources Management". Give us the main points that you are going to discuss with the audience at this symposium. (8)
  - 2.3 Briefly explain why Namibia`s climate is arid. (2)
  - 2.4 One of the climate drivers is rainfall. How will you describe rainfall occurrence in Namibia to tourists visiting from other countries? (3)
  - 2.5 Explain how water deficit is determined and why Namibia has a water deficit. (2)
- [20]**

**QUESTION 3 Ramsar Convention**

- 3.1 What are the functions of Ramsar Convention? (5)
  - 3.2 The Ramsar Representative from Ministry of Environment, Forestry and Tourism has requested you to motivate (in tabular format) why the Karst sinkholes and caves, would qualify as future Ramsar site, under the Ramsar category "Karst and other subterranean Hydrological systems". Prepare the table, showing five relevant criteria and how the Karst sinkholes and caves meet each. (10)
- [15]**

**QUESTION 4 Coastal Wetlands**

- 4.1 Explain the natural process that contributes to the rich surface water of the west coast (Atlantic Ocean) of Namibia. In your answer, clearly indicate how this process create richness in the surface water of this west coast. (7)
- 4.2 Explain the process of sulphur eruption at Namibia`s west coast and state its effects on supply of desalinated sea water at the coastal areas of Namibia. (10)
- 4.3 Briefly discuss the conservation issues in the desert coastal wetlands of Namibia. (3) [20]

**QUESTION 5 Riverine Wetlands**

- 5.1 Explain why the Orange River is considered as the most regulated basin in Southern Africa? Provide examples to cite where and how the river is regulated. (4)
- 5.2 Joseph Mbambangandu conservancy is the only conservancy where the Okavango River passes. According to the committee members consulted, the conservancy has proclaimed areas as protected fish reserves. Discuss the advantage of such initiative to the Okavango River biodiversity chain. (7)
- 5.3 Explain how the lodges established on the banks of certain riverine systems can contribute positively to improve the management of water and wetland resources. (5)
- 5.4 You are a manager of the 'Sikondo Green Scheme farm' (irrigation scheme) along the Okavango River; a group of visiting Natural Resources Management students from NUST ask you to answer the following questions:
- a) What is the aim of a green scheme? (2)
  - b) Where and how does Sikondo green scheme farm get its water? Also, provide the water conservation and management initiatives implemented at Sikondo green scheme farm. (3)
  - c) Discuss the effect (with regard to water and wetland resources) of a green scheme the Okavango River Basin? (5)
- 5.5 If you were to oversee the Kunene hydropower scheme/project, how would you ensure that such a project is carried out in a sustainable manner (from an environmental, social and economic perspective)? In your conclusion, include a brief outcome of the feasibility study, based on the video you watched in class. (9)
- 5.6 Discuss any five conservation issues facing ephemeral rivers in Namibia and their functions. (5) [40]

**QUESTION 6 Lacustrine Wetlands**

- 6.1 Clearly explain how sinkhole lake and caves are formed. In addition, discuss how the formation of lakes and caves enhance groundwater recharge in the Karst area in Namibia. (7)
- 6.2 Name and discuss the different layers in a stratified impoundments in summer. (8)
- [15]

**QUESTION 7 Palustrine Wetlands**

- 7.1 Explain how certain crustacea species are adapted to living in ephemeral rainwater pools. (5)
- 7.2 Briefly, discuss the conservation status of palustrine wetland systems in Namibia. Indicate the type of palustrine wetland and where they are protected in Namibia and other countries in the cases of trans-boundary shared river basins. (5)
- [10]

**QUESTION 8 Integrated Water Resources Management**

- 8.1 What are the main functions of a River Basin Management Committee (RBMC)? (3)
- 8.2 Clearly explain to community members living in the Kavango Region how a Mini-SASS sampling technique is carried out and for what purpose. (7)
- [10]

End

TOTAL [150]