NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Faculty of Health, Applied Science and Natural Resources

DEPARTMENT OF AGRICULTURE AND NATURAL RESOURCES SCIENCES

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

SECOND OPPORTUNITY EXAMINATION QUESTION PAPER	
EXAMINER(S)	Mr R. Kavari
MODERATOR:	Mrs. N. Nashipili

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 4 PAGES (Including this front page)

QUESTION 1 **Terminology**

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

1.1 Lotic vs Lentic Wetlands (2)

1.2 Palustrine vs Lacustrine wetlands (2)

1.3 Ephemeral river vs Perennial river (2)

1.4 Water and Wetland Resources Management (2)

1.5 Boreholes sustainable yield (2)

B: Give a correct word/term for the following:

1.6 A wetland system that flows every year, but only during the rainy season. (1)

1.7 The average amount of water that flows down a particular river, per year, expressed either as a depth (in millimeters) of water spread evenly across the entire drainage basin, or as a volume (in cubic meters) of water flowing past a given point. (1)

1.8 A water utility that is responsible for bulk water supply in Namibia. (1)

1.9 A sinkhole lake that has part of its water surface open to the air. (1)

1.10 A highly technical process of removing salt from seawater to make it portable. (1)

1.11 The mouth of large rivers where it mixes with tidal inflow from the sea. (1)

1.12 The process of gradual increase in phosphorus and nitrogen in lakes, resulting into algal bloom. (1)

1.13 A name given to a marine zone that is more than 200 m deep and it is beyond the continental shelf. (1)

1.14 The largest floodplain lake in Namibia. (1)

1.15 An inland Ramsar site in the North-central Namibia. (1)

1.16 The long, narrow strip of vegetation along a river course which supports life in an otherwise harsh environment by providing food, water, shade, shelter and habitat to wildlife, domestic stock and humans. In ephemeral systems this vegetation relies on alluvial waters. (1)

1.17 Area of the land capturing water draining towards a single river or lake. (1)

1.18 Layer of water in a dam that gets enough light for photosynthesis. (1)

1.19 Process of layering water in a lake, due to water density.
Upper **Epilimnion** + lower **Hypolimnion** separated by density difference (1)

1.20 The broader name given to fauna and flora adapted to living in water. (1)

[25]

QUESTION 2 Namibia`s Water Resources

2.1 Use a diagram and notes to explain the hydrological cycle of Namibia. Clearly label the diagram to indicate the percentage water balance of Namibia. (10)

2.2 Briefly, describe the issue of scale when as it applies to water availability and supply. (4)

[14]

QUESTION 3 Ramsar Convention

3.1 Explain how the Walvis Bay wetlands meet the Ramsar criteria? (10)

[10]

QUESTION 4 Coastal Wetlands

4.1 Briefly describe the littoral zone as part of marine zonation. (4)

4.2 Name any 4 coastal wetland birds. (4)

4.3 Describe the Kunene River Mouth from the physical and biological perspective. (10)

[18]

QUESTION 5 Riverine Wetlands

5.1 Explain why the flood pulse concept is important for perennial river systems such as the Okavango River and Zambezi River systems. (4)

5.2 Briefly describe the inter-basin transfer scheme that supplies water to the north-central part of Namibia and discuss the main conservation concerns related to it. (8)

5.3 Briefly, explain the five main habitats of the Okavango River wetlands. (10)

5.4 Clearly explain the ecosystem/ecological services provided by wetlands. (12)

[34]

QUESTION 6 **Lacustrine Wetlands**

6.1 Discuss the process of eutrophication and its threats to artificial lentic wetland systems such as impoundments/dams. (10)

6.2 Name any 4 dams/impoundment constructed on ephemeral rivers for the purpose of water supply. (4)

6.3 Discuss the threats of sedimentation and turbidity in dams/impoundments. (5)

[19]

QUESTION 7 **Palustrine Wetlands**

7.1 The Karst Groundwater Basin Management Committee (KGBMC) has asked you, as the Warden in charge of Waterberg EE Center, to write a **short article** for their newsletter on the importance of **seeps and springs** and the threats these wetlands face. As an introduction say why springs and seeps are ecologically important, then deal with **three** threats faced by **groundwater-fed springs and seeps** in the Waterberg area and conclude by recommending what farmers can do to conserve these important wetlands. (10)

7.2 Briefly, discuss the geothermal (hot water) springs in Namibia. (5)

[15]

QUESTION 8 **Integrated Water Resources Management**

8.1 Name any 5 parameters and or variables that you can monitor to ensure successful management of water and wetland resources. (5)

8.2 You are employed as a basin support officer in Namibia. Explain to a group of community members what the responsibilities of a River Basin Management Committee are. (10)

[15]

End
TOTAL [150]