



PAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF HEALTH, NATURAL RESOURCES AND APPLIED SCIENCES

DEPARTMENT OF NATURAL RESOURCE SCIENCES

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| QUALIFICATION: BACHELOR of NATURAL RESOURCE MANAGEMENT HONOURS | |
| QUALIFICATION CODE: 08BNRH | LEVEL: 8 |
| COURSE CODE: IWW821S | COURSE NAME: INTEGRATED WATER AND WETLAND MANAGEMENT |
| SESSION: JUNE 2025 | PAPER: THEORY |
| DURATION: 3 HOURS | MARKS: 110 |

| FIRST OPPORTUNITY EXAMINATION QUESTION PAPER | |
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| EXAMINER(S) | Mr. R Kavari |
| MODERATOR: | Mrs. N NASHIPII |

| INSTRUCTIONS |
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| <ol style="list-style-type: none">1. Answer ALL the questions.2. Read all the questions carefully before answering.3. Number the answers clearly |

THIS QUESTION PAPER CONSISTS OF _3_ PAGES (Including this front page)

QUESTION 1 WETLANDS AWARENESS

1.1 The Ramsar Convention encourages countries to commemorate the World Wetlands Day on 2 February and World Water Day is commemorated on 22 March, each year. As a Natural Resources Manager, use this opportunity to raise awareness on sustainable use of limited water and wetland resources in Namibia. In your brief presentation start by telling the audience the 2025 themes for the above mentioned celebrated days. Clearly give a brief description of what those themes entails to a global realistic situation. Then proceed to outline and explain your awareness raising points. (8)

1.2 Several initiatives has taken place, such as awareness raising events with various activities, posters and pamphlets through different media platforms. So, we can certainly say; awareness on water and wetland resources management has been done. However, the biggest question is; are these awareness raising initiatives effective? Write a short deliberation on how you can determine the effects of awareness raising on integrated water and wetland management. (7)

[15]

QUESTION 2 WETLANDS CONSERVATION - RAMSAR

2.1 Write a motivation to the Ministry of Environment, Forestry and Tourism, in which you are motivating how the Cape Cross lagoons meet the Ramsar criteria. Clearly indicate which criteria it meets. (10)

2.2 Name Namibia`s newest Ramsar site (Proclaimed in year 2013/2014) and briefly, provide a bio-physical description of this wetland. (5)

[15]

QUESTION 3 WATER RESOURCES MANAGEMENT IN NAMIBIA

3.1 More often, the water and wetland resources in rural set ups are left unmonitored, thus resulting in a gap with reference to data availability. As a Water Resources Management Technician, clearly explain how you would determine water balance, water distribution outline (water reticulation system), water abstraction, water storage, water supply, water consumption and water losses in a rural communal settlement in Namibia. In your conclusion, say why such parameters are important to monitor to ensure effective management water resources. (10)

3.2 As a Geo-hydrologist at the Ministry of Agriculture, Fisheries, Water and Land Reform, explain how you will monitor and assess the physical quality of groundwater in Namibia. Also give the overall status of the physical quality of water in Namibia, based on the maps shared during IWW821S lectures. (5)

3.3 A specific biomonitoring technique is used to assess the health status of the lotic water systems. Give the name of the sampling technique, and clearly explain to community members how the technique is conducted. Also show how the results are interpreted. (10)

[25]

QUESTION 4 INTEGRATED WATER SUPPLY AND MANAGEMENT IN THE CENTRAL NAMIB AREA

Unfortunately, water is not always where people are or most development activities are concentrated. As a Natural Resources Manager working in the water sector, design a robust plan on how you can overcome water shortages in an arid Erongo region. In your strategies, clearly provide realistic solutions from your experience during the NUST West Coast Excursion. Provide a brief introduction, indicating the causes of water shortages in the Erongo Region.

(15)
[15]

QUESTION 5 INTERNATIONAL- LEVEL RIVER BASIN MANAGEMENT

All of Namibia`s permanent river systems are on the periphery of the country, thus shared with neighbouring countries. Therefore, River Basin Management Commissions were formed to address issues at international level.

5.1 The Cuvelai Watercourse Commission (CUVECOM) between Namibia and Angola was established in the year 2014, as Namibia relies on annual floods from Angola to replenish water and fish. As a Basin Support Officer write a short essay advising community members on threats and conservation issues affecting the Cuvelai-Etосha Basin. (8)

5.2 Flood pulse concept is important for perennial river systems such as the Okavango river systems. This river system is shared between 3 countries, as a result the Permanent Okavango River Basin Commission (OKACOM) was established in the year 1994. OKACOM ensures that the Environmental Water Requirements are agreed and observed in the basin. Explain the three water use scenarios that determined using the DRIFT method (Downstream Response to Imposed Flow Transformation). (7)

[15]

QUESTION 6 INTEGRATED WATER RESOURCES MANAGEMENT

6.1 According to the maps from the Centre for Environmental Systems Research, a considerable number of areas in the world will be under extreme water stress by the year 2050. As a water resource strategist, make use of an annotated diagram to outline different approaches to enhance our abilities to sustain the water sector under increasingly variable climatic conditions and climate change. (25)

[25]

TOTAL – 110 Marks