QUALIFICATION:
Bachelor of Natural Resource Management (Nature Conservation)

QUALIFICATION CODE: 27 BTNC  NQF LEVEL: 6

COURSE: Aquatic Ecosystems Management  COURSE CODE: AEM 610 S

DATE: 9 June 2014  SESSION: 8:00 – 11:00

DURATION: 3 Hours  MARKS: 150

FIRST OPPORTUNITY EXAMINATION QUESTION PAPER

EXAMINER: Ms. S. Bethune
MODERATOR: Ms. N. Nashipili

THIS QUESTION PAPER CONSISTS OF 3 PAGES (EXCLUDING THIS FRONT PAGE)

INSTRUCTIONS
1. Answer all questions
2. Please write clearly and neatly
3. Number the answers clearly

PERMISSIBLE MATERIALS
1. Examination paper
2. Examination script
QUESTION 1

1.1 Study the map below and name the wetlands 1-8.  

1.2 a) What do wetlands 1-4 have in common?  
   b) What do wetlands 5-8 have in common?  

1.3 Define and give a Namibian example of:  
   a) Linear Oasis.  
   b) Endoreic Pan.  

1.4 Clearly distinguish between Catchment and Watershed.  

1.5 Give correct term for each of the following:  
   a) A sandy riverbed that stores groundwater.  
   b) Pollution by high nutrient concentrations e.g. from fertilizers washing into a river.  
   c) Wetland type with shallow, well vegetated, lentic water.  
   d) The dark, deep, dense, nutrient rich layer of water in a stratified lake.  

[20]
QUESTION 2  RAMSAR

2.1 What is the Ramsar Convention and when did Namibia join? (2)

2.2 Name Namibia’s newest Ramsar site and briefly describe the habitat types and fauna found there that make it representative of this type of wetland within Southern Africa. (3)

2.3 What is the Montreux Record? Which of Namibia’s wetlands is on this list? Briefly explain why it is on the list. (5)

2.4 Write a short essay to discuss how Etosha Pan, when wet, meets different Ramsar criteria. (15)

[25]

QUESTION 3  COASTAL WETLANDS

3.1 Give four good reasons, linked to Ramsar criteria, why the Walvis Bay wetlands are considered to be the most important coastal wetlands for waterbirds in southern Africa. (8)

3.2 One per cent of the world’s oceans produce 50% of the world’s commercial fish production due to upwelling. Namibia is blessed with such a very productive marine ecosystem. Write an essay to describe the process of upwelling, including the main factors that cause it and how this improves our fishery. (12)[20]

QUESTION 4  RIVERINE WETLANDS

4.1 Namibia has agreements with neighbouring countries to jointly manage the water and water resources of its perennial rivers:
   a) What is ORASECOM and which countries share this river basin with Namibia? (4)
   b) What is OKACOM and which countries that share this basin with us? (3)

4.2 a) Sketch and accurately label the life-cycle of the parasite that causes urinary bilharzias introduced to Olushandja Dam by the interbasin transfer of water from the Kunene. (12)
   b) Discuss one other environmental impact of this interbasin water transfer from Kunene. (2)
   c) What is the water supplied by the interbasin water transfer scheme used for and where? (4)

4.3 What is a “biological corridor” and give an example of an animal uses these corridors in western Namibia. (2)

4.4 Write a paragraph on the impacts that building a dam on an ephemeral river will have downstream. (8)[35]

QUESTION 5  LACUSTRINE WETLANDS

5.1 Explain how stratification in an impoundment breaks down in autumn and how this can cause a temporary algal bloom. (5)

5.2 As the Conservator based in Tsumeb, write a motivation to your Director at MET showing that the Namibian Karst sinkholes and caves meet four criteria to qualify for Ramsar status. Clearly state each criterion it meets and explain how. (10)[15]

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QUESTION 6  PALUSTRINE WETLANDS

6.1 Name two geothermal springs that are important tourist destinations in Namibia (2)

6.2 Name two different kinds of palustrine systems found in Namibia giving an example of each. (4)

6.2 Give the scientific and common names and sketch the life-cycle of the only Namibian fish species that can survive its pool drying out. (10)

6.3 What is the habitat of these near-endemic fish and what is the main conservation concern related to this? (4)

QUESTION 7  AQUACULTURE

7.1 As a fishery officer, you have been asked to develop a semi-intensive, closed, community-based, aquaculture venture, integrated with other farming, alongside the Okavango River:
   a) Describe the set-up of your fish farm. You may use a well labelled sketch. (6)
   b) Name two species of fish that you would recommend using. (2)
   c) Give three advantages of the species you have chose, to show why they are well suited for aquaculture? (3)

7.2 Clearly distinguish between extensive and intensive fish production, giving 4 differences. (4)

TOTAL - 150