NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF HEALTH, NATURAL RESOURCES AND APPLIED SCIENCES

DEPARTMENT OF AGRICULTURE AND NATURAL RESOURCES SCIENCES

QUALIFICATION: BACHELOR OF SCIENCE IN AGRICULTURE	
QUALIFICATION CODE: 07BAGA	**LEVEL:** NQF Level 7
COURSE CODE: WRM721S	**COURSE NAME:** WATER RESOURCES MANAGEMENT
DATE: NOVEMBER 2022	
DURATION: 3 HOURS	**MARKS:** 100

FIRST OPPORTUNITY EXAMINATION QUESTION PAPER	
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INSTRUCTIONS

1. **Answer all questions**
2. **Number the answers clearly**
3. **Report all your answers to the correct significant figures**
4. **Calculator**

THIS QUESTION PAPER CONSISTS OF 2 PAGES (Excluding this front page)

Question 1

1.2 What are the two ways that characterized the source of water pollution give an example of each? (4)

1.3 Differentiate between point and non-point sources of pollution and give 2 examples of each? (8)

Question 2

What are the 3 biological contaminants that occurs in water and give 2 examples of diseases resulting from each. (9)

Question 3

Assume as the size of the roof-top is 10m by 50m, the total amount of rainfall in the area is 600mm per annum and the runoff coefficient is 0.9. Calculate how many litters of water will be harvested per year. (5)

Question 4

Calculate the livestock drinking water quality index by using water value, assigned weight and livestock standard for drink water as indicated in the table below. Please interpret the answer. (30)

		Water	Assigned	Livestock
Parameter	**Unit**	**Value**	Weight	Standard
p H		**7.6**	2.7	10
Conductivity	**mS/m**	**260.0**	2.9	1000
TDS (determined)	**mg/l**	**1748**	4.6	1000
Turbidity	**NTU**	**0.60**	2.9	30
Sulphate as SO_4	**mg/l**	**822**	3.3	125
Chloride as Cl	**mg/l**	**144**	4.5	15000
Fluoride as F	**mg/l**	**9.8**	2	2
Nitrate as N	**mg/l**	**0.5**	2.57	11
Nitrite as N	**mg/l**	**0.1**	2	10
T-Alkalinity as $CaCO_3$	**mg/l**	**310**	2.5	500
T-Hardness as $CaCO_3$, cal.	**mg/l**	**101**	2	100
Calcium as Ca	**mg/l**	**34**	2	1000
Magnesium as Mg	**mg/l**	**4.0**	2	2
Sodium as Na	**mg/l**	**510**	2.5	400
Potassium as K	**mg/l**	**47**	2	20
Iron as Fe	**mg/l**	**1.5**	1	0.3
Manganese as Mn	**mg/l**	**0.03**	2	2

Question 5

What characteristics do you monitor when determining the quality? (3)

Question 6

6.1 Water is water pollution? (3)

6.2 What are the two ways that characterized the source of water pollution give an example of each? (4)

Question 7

Explain impact of physical parameter and their measures as follows.

7.1 Dissolved Oxygen (6)

7.2 pH (6)

[12]

Question 8

Give 7 methods of Water Conservation. (5)

Question 9

Answer the following statement whether they are true or false.

9.1 The governmental role is to create a framework in which management, determination of the politics, planning, waters distribution, monitoring, law application, and solving of conflicts should occur. (2)

9.2 The governments have to create conditions so that all acting persons who are interested in the problems of water resources use and their conservation are allowed to participate in the process of their solving and to make contracts for achievement of suitable solutions for all. (2)

9.3 In the present conditions of free market economy, the local communities must play the reduced role of deliverance of services and to concentrate more efforts on its role of regulator and control on the deliverance of the specialized services. (2)

9.4 Government and their members are frequently involved in water resource management and conservation activities. (2)

[8]

Question 10

What are the main economical tools of IWRM and why are they necessary? (6)

Total:.....[100]