



**NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY**

FACULTY OF ENGINEERING AND SPATIAL SCIENCES

DEPARTMENT OF ARCHITECTURE AND SPATIAL SCIENCES

QUALIFICATION: BACHELOR OF REGIONAL AND RURAL DEVELOPMENT			
QUALIFICATION CODE: 07BRAR	LEVEL: 5	CREDITS: 12	
COURSE CODE: NRM511S	COURSE NAME: NATURAL RESOURCE MANAGEMENT		
DATE: JULY 2022	PAPER: THEORY		
DURATION: 3 HOURS	MARKS: 100		

SECOND OPPORTUNITY / SUPPLEMENTARY EXAMINATION QUESTION PAPER	
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INSTRUCTIONS
<ol style="list-style-type: none">1. Answer ALL the questions.2. Read the entire question paper before answering the questions.3. Questions may be answered in any sequence, provided that they are numbered clearly and correctly.4. Write clearly and legibly.

PERMISSIBLE MATERIALS

Pen, ruler, pencil and eraser

THIS QUESTION PAPER CONSISTS OF 12 QUESTIONS AND 7 PAGES (including this front page)

Question 1:

Select the single *CORRECT* answer to each of the following questions. Just write down the number, e.g. (a) D.

- (a) Water is provided to
A Gobabis by the Otjivero Dam
B Keetmanshoop by the Neckartal Dam
C Rehoboth by the Omatako Dam
D Swakopmund by the Swakoppoort Dam
E Windhoek by the Oanob Dam (1)
- (b) Eutrophication is caused by
A plastic pollution
B ozone depletion
C coral reef bleaching
D algal blooms
E destruction of mangroves (1)
- (c) *Demand-side* water management includes
A installation of water-wise gardens
B construction of water-purification plants
C desalinization of seawater
D transboundary water-use agreements
E inter-basin water transfers (1)
- (d) The major international treaty for protection against *desertification* is the
A Montreal Protocol
B UNCCD
C Paris Agreement
D UNFCCC
E UNCBD (1)
- (e) A situation where the total annual rainfall is close to the long-term mean, the runoff in rivers is normal and the well-adapted natural vegetation gets enough moisture, but there is a long dry spell in the middle of the rainy season, can lead to a
A meteorological drought
B geohydrological drought
C crop drought
D hydrological drought
E pasture drought (1)

- (f) The estimated percentage of Namibian precipitation that *evaporates* very soon after rains is
- A 1 %
 - B 2 %
 - C 14 %
 - D 83 %
 - E 100 %
- (1)
- (g) Which one of the following is a *coal*-fired power station?
- A Omburu
 - B Kudu
 - C Ruacana
 - D Baynes
 - E Von Eck
- (1)
- (h) Which one of the following is the major *anthropogenic* greenhouse gas?
- A methanol
 - B chlorofluorocarbon
 - C carbon dioxide
 - D carbon monoxide
 - E ozone
- (1)
- (i) The atmospheric layer where high-energy radiation and charged particles strip molecules and atoms of their electrons, is the
- A troposphere
 - B ionosphere
 - C lithosphere
 - D stratosphere
 - E cryosphere
- (1)
- (j) The densest atmospheric layer, containing most air molecules, is the
- A thermosphere
 - B magnetosphere
 - C mesosphere
 - D exosphere
 - E troposphere
- (1)

[10]

Question 2:

List and explain four (4) *supportive* services provided by the *atmosphere*. (4)

[4]

Question 3:

(a) Differentiate between *dwarf shrubs* and *forbs*. (4)

(b) Differentiate between *savannas* and *woodlands*. (4)

(c) Differentiate between *indigenous* and *endemic* plants. (4)

[12]

Question 4:

(a) Discuss the advantages of high *ecosystem diversity*. (3)

(b) In addition to over-utilisation / exploitation, what are the four (4) other major reasons for biodiversity decline? (4)

[7]

Question 5:

(a) Climate change has a multitude of impacts on oceans, coastlines, marine and coastal ecosystems. Choose any two (2) of these effects and discuss them. (6)

[6]

Question 6:

(a) Propose three (3) *human interventions* for *adaptation* of *ecosystems* to climate change. (What can humans do to help ecosystems adapt to climate change?) (3)

- (b) Climate change is projected to increase the frequency and intensity of heatwaves (extraordinary hot periods) in Namibia. Suggest some measures that *local authorities* can implement to let *urban dwellers* cope with these extreme events. (6)
- (c) Explain how melting of ice in the Arctic can amplify (increase, hasten) climate change. (3)
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- [12]**

Question 7:

- (a) Differentiate, with clear examples, between *waste* and *pollutants*. (4)
- (b) In what ways can *sound pollution* harm *marine mammals*? (3)
-
- [7]**

Question 8:

- (a) Although *hydroelectricity* is a form of renewable energy, it has some adverse environmental and socio-economic impacts. Elaborate on this statement. (4)
- (b) *Nuclear power plants* are potentially dangerous, but they have several advantages. Discuss these positive aspects. (3)
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- [7]**

Question 9:

- (a) Explain, with appropriate examples of its uses, what *dimension stone* is. (3)
- (b) Provide the names and locations of two Namibian *gold* mines. (4)
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- [7]**

Question 10:

- (a) Explain the respective roles of (i) the Namibian Ministry of Agriculture, Water and Land Reform, (ii) NamWater and (iii) local authorities in water supply. (7)

- (b) Describe the water sources of the City of Windhoek. (7)

[14]

Question 11:

Distinguish between *aridity* and *drought*. (6)

[6]

Question 12:

Match each *term* in Column 1 with the *appropriate description* in Column 2. Write down only the *capital letter* from Column 2 next to the *small letter* from Column 1, for example (a) D.

<u>Column 1</u>	<u>Column 2</u>
(a) Tropospheric ozone	A Confining water by building a dam in a river
(b) Afforestation	B Accumulation of salts in soil over time
(c) Potable water	C A rock or sediment formation that holds groundwater
(d) Bush encroachment	D River basin
(e) Impoundment	E Removing minerals from seawater to make it drinkable
(f) Aquifer	F Planting trees in deforested areas
(g) Desalinization	G Provides protection against ultraviolet radiation
(h) Catchment	H Invasion of undesirable woody species in areas that were previously devoid of them or had only low densities
	I Carbonated water
	J Taking water from a source

(continue on next page)

K	Overland flow of water	
L	A system of canals and pipelines for transfer of water	
M	Planting trees in previously unforested areas	
N	Control of bush by using arboricides	
O	Damages crops and human skin	
P	Drinkable water	(8)

[8]**TOTAL: 100**