



**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: 7	CREDITS: 12	
COURSE CODE: NRS711S	COURSE NAME: NATURAL RESOURCES AND SUSTAINABLE DEVELOPMENT		
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 10 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) Which one is a *biotic* component of ecosystems?
A Water
B Fungi
C Light
D Energy
E Nutrients (1)
- (b) Which one is *not* a *regulatory* service provided by ecosystems?
A Genetic diversity
B Pest control by predators
C Flood attenuation
D Decomposition of waste
E Carbon sequestration and storage (1)
- (c) The Millennium Development Goals are
A The major outcome of the 1992 Rio Earth Summit
B A set of development objectives and targets for the period 2000-2015
C A legally binding treaty to address land degradation
D The objectives of the 2030 Agenda for Sustainable Development
E A framework for development during the 21st century (1)
- (d) Ecological Deficit is
A The time left before the Earth System collapses
B The date in a year when mankind's demand for ecological resources and services surpasses Earth's capacity to replace those resources and absorb waste
C Earth's biocapacity minus mankind's ecological footprint (in global hectares)
D The number of days per year that Earth's biocapacity is exceeded
E Reached when the global population passes 8 billion (1)
- (e) Select the *incorrect* statement. Earth System processes
A Often involve energy fluxes between sub-systems
B Include the phosphorus, carbon and rock cycles
C Can take place at both very small and very large spatial scales
D Are too vast and powerful to be influenced by human activities
E Are responsible for maintaining natural equilibria (1)

- (f) The role of Independent Power Producers is to
- A Make policies on electricity supply
 - B Generate electricity
 - C Regulate the electricity supply industry
 - D Transmit electricity to end-users
 - E Import electricity from neighbouring countries (1)
- (g) The following is *not* a global *impact* of consumption:
- A Depletion of material resources
 - B Stress on Earth's ecosystem
 - C Regeneration of renewable resources
 - D Depletion of energy resources
 - E Adverse effects on human well-being and social systems (1)
- (h) The Multidimensional Poverty Index expresses
- A The geometric mean of life expectancy, primary school education and the gross national income
 - B Multiple deprivations at individual level
 - C Gender inequality
 - D Inequality in income distribution within a population
 - E An inequality-adjusted measure of human development (1)
- (i) Regulation of *shipping*, including safety, security, legal matters, technical cooperation, efficiency and environmental concerns are the responsibility of the
- A International Maritime Organisation
 - B UN Convention on the Law of the Sea
 - C UN Deepsea Mining Authority
 - D MARPOL
 - E International Seabed Authority (1)
- (j) Nationally Determined Contributions is a term to describe
- A Greenhouse gas emissions of individual countries relative to total global emissions
 - B Financial commitments by developed countries to the Green Climate Fund
 - C Voluntary commitments, identified by countries themselves, to reduce their activities that contribute to climate change
 - D National emission reduction commitments under the Kyoto Protocol
 - E In-kind contributions from developing countries to leverage adaptation funding (1)

[10]

Question 2:

“The Planetary Boundaries concept of the Stockholm Resilience Centre (Röckstrom and colleagues) defined environmental limits to nine Earth System processes within which mankind can operate safely.”

- (a) Explain the meaning of this statement, including the reason for developing this model. (5)
- (b) Name five (5) of the nine subsystems. *[Excluding the ‘novel entities’ mentioned in (c)]* (5)
- (c) What are ‘novel entities’ and why are they included in the Planetary Boundaries model? (3)

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Question 3:

- (a) One of the Agenda 21 Sustainable Development Principles (#10) states that environmental issues are best handled with the participation of all concerned citizens, awareness and information on hazards and activities in their communities, and opportunities to influence decision-making. What has Namibia done to incorporate this principle in its developmental and environmental planning and legislation? (4)
- (b) Why are indigenous people and local communities specifically mentioned in the Sustainable Development Principles? (3)

[7]

Question 4:

- (a) Explain the need to maintain genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, as expressed in target 2.5 of Sustainable Development Goal 2 (No Hunger). (5)
- (b) What has Namibia done in support of this component of SDG2? (3)

[8]

Question 5:

List nine (9) characteristics of a sustainable city in terms of *transport* and *healthy living conditions*. Write full sentences. (9)

[9]

Question 6:

Discuss the links between *health issues* and *exposure to pollution*. Use very specific examples to support your arguments. (8)

[8]

Question 7:

- (a) What are the objectives of the Benguela Current Convention? (7)
- (b) Which countries are parties to the Benguela Current Convention? (3)
- (c) What is unique about the conservation status of the Namibian coastline? (2)

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Question 8:

- (a) Explain, with appropriate examples, how *certification* (e.g. of organically grown products) and *labelling* (e.g. of energy efficient appliances) can contribute to sustainable consumption and production. (4)
- (b) Suggest approaches that Namibian tourism establishments can take in support of sustainable tourism. (7)

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Question 9:

- (a) Discuss the present situation regarding solar power generation in Namibia. (5)

- (b) Propose *demand-side* management approaches that can help to reduce the electricity demand. (7)

[12]

Question 10

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) Cryosphere	A A consequence of ocean acidification
(b) Walvis Ridge	B Birth rate of a population
(c) Natality	C Unlimited economic growth is impossible in a system with finite resources
(d) Deceleration phase of population growth	D Earth's subsystem that involves the upper mantle, crust and soil
(e) 'Tragedy of the Commons' theory	E Population growth is suppressed as intra-species competition increases and resources become more limited
(f) Great Acceleration	F Shared resources are usually over-exploited, as everybody strives to maximise their own use
(g) Bleaching of coral reefs	G Exponential increase in resource use and waste generation since the Industrial Revolution
(h) Conduction	H Lifestyle diseases
(i) Zoonoses	I An inter-governmental science-policy platform on climate change
(j) IPBES	J Immigration rate of a population

(continue on next page)

K	Populations crash catastrophically when they run out of resources
L	Earth's subsystem that involves ice- and snow-covered areas
M	Linear increase in fertilizer production, greenhouse gas emissions, and global trade since the introduction of steam- and petroleum-driven machinery
N	Heat transfer directly between molecules in a rigid matrix
O	An inter-governmental science-policy platform on biodiversity and ecosystem services
P	Heat distribution through the movement of fluids due to density differences
Q	Diseases transmitted from animals to humans
R	One of Namibia's Ramsar Sites
S	One of Namibia's Ecologically and Biologically Significant Areas
T	A consequence of ocean warming

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TOTAL: 100