



FACULTY	AGRICULTURE, ENGINEERING AND NATURAL SCIENCE		
DEPARTMENT	ENVIRONMENTAL SCIENCE		
SUBJECT	SYSTEM THINKING		
SUBJECT CODE	GIS3671		
DATE	May/June 2022		
DURATION	3 HOURS	MARKS	100

SPECIAL/SUPPLEMENTARY EXAMINATION

Examiner: E Hamunyela (PhD)

External Moderator: Prof. T. Dube, University of the Western Cape

INSTRUCTIONS

1. Work in an orderly manner and present your work as neatly as possible.
2. While most of the marks will be awarded for content, candidates must bear in mind the importance of presentation, i.e. insight and critical thinking.
3. Number your questions correctly and clearly.
4. This paper consists of ONE (1) page (excluding this front page).
5. Answer all questions in Section A and B .

1. Differentiate (not define) between the following terms
 - a. Systematic Thinking and Systemic Thinking [4]
 - b. System stability and System resistance [4]
 - c. Leverage point and tipping point [4]
 - d. Net source and net sink [4]
 - e. A mess and problem [4]
2. Mention two types of flows that may occur in a complex system. [4]
3. Explain the role of reinforcing and balancing loops in complex social systems. [6]
4. Using a line graph, show how a stock would change over time when a reinforcing loop is weaker than the balancing loop. Justify your answer. [6]
5. Explain why it is practically impossible for systems with either reinforcing or balancing loops only to exist. [6]
6. Using illustrations, explain why it is justifiable to view UNAM main campus as a system. [10]
7. Resilience and self-organisation make systems to work so well.
 - a. Differentiate between resiliency and self-organisation. [4]
 - b. Explain how a combination of resilience and self-organisation would make a system work so well. [5]
8. An outbreak of coronavirus (COVID-19) in Wuhan city in China has caused huge damage to the global economy in the last two years.
 - a. Discuss how the following might have contributed to the spread of the COVID-19 in Namibia.
 - i. Layer of limits [3]
 - ii. Bounded rationality [3]
 - iii. Delay [3]
9. High unemployment among the university graduates in Namibia is often blamed on the poor education system.
 - a. As a system thinker, do you agree that the problem of high unemployment is largely caused by poor education system? Motivate your answer. [4]
 - b. Use the stock-flow model to illustrate the systems that the Namibia education system interacts with. [10]
 - c. In your view, which two of these systems have huge influence on the performance of the Namibian education system? Motivate your answer. [6]
 - d. Propose a new system design for Namibian education system to improve its quality. [10]

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