



**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY**

**SCHOOL OF SPATIAL PLANNING AND NATURAL RESOURCE MANAGEMENT**

**UNIVERSITY EXAMINATION FOR THE DEGREE OF  
BACHELOR OF ARTS IN PLANNING**

**2<sup>ND</sup> YEAR SEMESTER II 2021/2022 AUGUST EAXAM**

## **MAIN EXAMINATION**

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**COURSE CODE:** PNB 1215

**COURSE TITLE:** PRINCIPLES AND ELEMENTS OF PHYSICAL AND  
BIOLOGICAL ENVIRONMENT

**VENUE:** **STREAM:** BA PLANNING 4.2

**DATE:** **EXAM SESSION:**

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**Instructions:**

- 1. Answer Question ONE (COMPULSORY) and ANY other 2 questions**
- 2. Candidates are advised not to write on the question paper.**
- 3. Candidates must hand in their answer booklets to the invigilator while in the examination room.**

- Q1. a) i) Define the terms Ecology and Environment (2 Marks)  
 ii) Differentiate between Autecology and Synecology (2 Marks)  
 ii) Outline the three modern branches of ecology (3 Marks)  
 iii) Outline the role of Kenya National Environmental Authority in Environmental Management (4 Marks)
- b) i) Explain why Oxygen cycle is critical for life on earth (3 Marks)  
 ii) Describe how human being may interfere with the carbon cycle and affect the environment (4 Marks)  
 iii) Explain the role of Kyoto Protocol in global environmental conservation and management (6 Marks)
- c) i) Provide supporting evidence for the use of ecolabeling to support environmental conservation and management (3 Marks)  
 ii) How does World Health Organization (WHO) integrate its actions on environment with respect to SDG on air pollution? (3 Marks)
- Q2. a) Explain how organisms cope with stressful and adverse abiotic environmental conditions (8 Marks)  
 b) Discuss briefly the impact of urban sprawl on the high infrastructure and energy cost (4 Marks)  
 c) Land use changes affect the cost of planning and open spaces in unplanned urban areas. Explain this statement (4 Marks)
- Q3. a) Explain and differentiate energy and matter in the environment (13 Marks)  
 b) Relate the energy flow in the ecosystem to trophic relationships in the environment (7 Marks)
- Q4. a) With the aid of a diagram, explain the carbon cycle and processes between the sediments, hydrosphere, biosphere and the atmosphere (10Marks)  
 b) Illustrate the interaction between nitrogen cycle, agriculture and microorganisms (10 Marks)
- Q5. a) Discuss briefly the ten (10) core principles of ecosystem management (10 Marks)  
 b) Explain the human-landscape interaction with an example of urbanization, agriculture and industrialization in a riverine landscape (10 Marks)