



UNIVERSITY OF RUHUNA

Faculty of Engineering

End-Semester 8 Examination in Engineering: January 2019

Module Number: CE 6253

Module Name: Ecological Engineering

[Three Hours]

[Answer all questions, each question carries TWELVE marks]

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- Q1. a) Ecosystem distribution is influenced by climatic conditions.
- List four climatic factors that determine the ecosystem distribution. [2 Marks]
 - Describe major characteristics of tropical evergreen forests. [2 Marks]
- b) Primary and secondary production, energy flow and material cycling are parts of a complex mechanism. Critically analyze this statement. [4 Marks]
- c) Water reaches to the highest density at 4°C temperature. Discuss the importance of this factor on functioning of ecosystems. [4 Marks]
- Q2. a) Global warming is a common topic in discussion in today's world.
- Explain global warming. [3 Marks]
 - Discuss the contribution of human activities in increasing global warming. [3 Marks]
- b) Ecosystem degradation has many negative impacts on ecosystems.
- Explain the acceleration of biological invasion in degraded ecosystems. [3 Marks]
 - Evaluate the negative impacts of waste discharge into marine ecosystems. [3 Marks]
- Q3. a) Constructed wetlands have emerged as a viable alternative for secondary treatment of domestic wastewater.
- What are the benefits of having a constructed wetland for treating domestic wastewater? [2 Marks]
 - Explain main pollutant removal mechanisms in constructed wetlands. [3 Marks]
 - Discuss the benefits of using planted aquatic systems over unplanted systems. [4 Marks]
- b) Planted wetland systems are suitable for secondary wastewater treatment in Sri Lanka. Evaluate this statement with examples. [3 Marks]

Q4. Storm water management is among top priorities in modern urban planning.

a) Discuss the problems arisen due to poor storm water management in Sri Lankan cities. Explain with examples.

[4 Marks]

b) Explain the way we can accommodate ecological functions of a green roof in storm water management.

[4 Marks]

c) How you can justify the cost of a green roof with the benefits?

[4 Marks]

Q5. a) Explain major factors to consider in planning ecosystem restoration.

[2 Marks]

b) Discuss the importance of a monitoring in ecosystem restoration.

[3 Marks]

c) A forest ecosystem is degraded due to logging along many years. In a rehabilitation activity it is planned to introduce a non-native tree species in the area. Evaluate potential impacts of this rehabilitation plan.

[4 Marks]

d) A road corridor is proposed to pass through a wetland system. Propose impact mitigation activities to minimize the damage to the wetland ecosystem functions.

[3 Marks]