

**NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY**

**FACULTY OF INDUSTRIAL TECHNOLOGY**

**DEPARTMENT OF TECHNICAL TEACHER EDUCATION**

**Evolution and Ecology -TBE138**

**SEPTEMBER 2010 EXAMINATION**

Instructions

Answer any **four** questions,

Each question carries 25 marks.

1. “Reproductive success of a species may be a function of itself as an organism or it may be a function of environmental factors”. Discuss this statement.
2. Describe ecological succession in terrestrial ecosystems.
3. Describe how natural selection adapts a population to its local environment.
4. Some species have been rescued from near extinction by conservationists. In terms of the evolutionary theory, what problems do such species face as their population rebound from a small size?
5. The table below shows data of tree species for two communities, A and B.

Tree species	Community A	Community B
Species 1	8	12
Species 2	19	15
Species 3	11	13
Species 4	9	16
Species 5	3	0
Species 6	5	19
Species 7	13	17

- a) What is **S** for each community? (2 marks)
- b) Calculate Simpson's **D** and **E** for communities A and B. (10 marks)
- c) Calculate Shannon-Weiner's **H** and **E** for communities A and B (10 marks)
- d) What conclusions can be made about the diversity of the two communities (3 marks)

6. Critically evaluate the latitudinal gradient concept in explaining geographical patterns of species diversity.

*End of Question paper*

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**SEPTEMBER 2010 SUPPLEMENTARY EXAMINATION**

Instructions

Answer any **four** questions,

Each question carries 25 marks.

1. Describe the factors that determine the distribution of organisms in the environment.
  
2. “Reproductive success of a species may be a function of itself as an organism or it may be a function of environmental factors”. Discuss this statement.
  
3. Describe these three biogeochemical cycles
  - a) Carbon cycle (9marks)
  - b) Phosphorus cycle (8marks)
  - c) Sulphur cycle (8marks)
  
4. Write an essay on the geographical patterns of species diversity
  
5. “Habitat fragmentation is a process of environmental change which is important in conservation biology”. Discuss this statement.
  
- 6 (a) Describe the mechanisms of successional change (10marks)  
(b) Discuss the theory of island biogeography. (15marks)

*End of Question Paper*