



**UNIVERSITY OF SWAZILAND**  
Faculty of Health Science

Department of Environmental Health  
Sciences

Final Examination 2007

- TITLE OF PAPER : ENVIRONMENTAL ECOLOGY
- COURSE CODE : EHS 523
- DURATION : 3 HOURS
- MARKS : 100
- INSTRUCTIONS : ANSWER ANY FIVE QUESTIONS
- : QUESTIONS ONE AND TWO ARE COMPULSORY
- : EACH QUESTION CARRIES 20 MARKS
- : NO PAPER SHOULD BE BROUGHT INTO NOR OUT  
OF THE EXAMINATION ROOM
- : BEGIN EACH QUESTION ON A SEPARATE SHEET  
OF PAPER

DO NOT OPEN THE QUESTION PAPER UNTIL PERMISSION HAS BEEN  
GRANTED BY THE INVIGILATOR.

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QUESTION ONE

1. Natural capital includes all of the following except
  - a. Sunlight
  - b. Air
  - c. Water
  - d. Soil
  
2. Exponential growth
  - a. Remains constant
  - b. Starts out slowly and remains slow
  - c. Starts out slowly then becomes very rapid
  - d. Starts rapidly and remains rapid
  
3. Which kind of diversity includes the other three?
  - a. Genetic diversity
  - b. Biodiversity
  - c. Species diversity
  - d. Ecological diversity
  
4. Which of the following statements best illustrates the tragedy of the commons?
  - a. A factory pollutes a river as much as the law allows
  - b. Some levels of pollution are life threatening
  - c. Some activities harm the environment, but others do not
  - d. Irrigated cropland can be ruined by salinization
  
5. On the outskirts of a municipality lies a forest on public property. A person applying the precautionary principle might suggest
  - a. Clear-cutting the forest to provide taxes for the town
  - b. Converting the natural woods to tree farms
  - c. Harvesting trees at their estimated sustained yield
  - d. Harvesting trees below their estimated sustained yield
  
6. Root causes of environmental problems include
  - a. Rapid population growth
  - b. Even distribution of wealth
  - c. Increasingly sustainable use of resources
  - d. Prices reflecting environmental costs
  
7. What is the goal of ecology?
  - a. To eliminate pollution
  - b. To eliminate environmental degradation
  - c. To trace the flow of energy through the environment

- d. To learn about connections in nature
8. You are an ecologist studying alligators in the outback. You find that the population of alligators is so depleted that organisms that depend on alligator holes for their survival are also being hurting. You would most likely label the alligators
- Threatened
  - Endangered
  - Ecologically extinct
  - Locally extinct
9. The introduction of nonnative species often results in unforeseen consequences. This experience indicates that when introducing nonnative species, we would be well-advised to apply the
- First law of thermodynamics
  - Law of common property
  - Precautionary principle
  - Law of supply and demand
10. Which of the following is an economic approach to reducing overfishing?
- Reducing bycatch levels
  - Eliminating fishing subsidies
  - Reducing the introduction of alien species
  - Improving enforcement of fishing regulations
11. A group of individuals of the same species occupying a given area at the same time is called a
- Species
  - Population
  - Community
  - Genus
12. The most important factor in determining which biome is found in a particular area is
- Soil type
  - Topography
  - Magnetic field
  - Climate
13. Which of the following statements is false?
- The existence, abundance, and distribution of a species in an ecosystem are determined by whether the levels of one or more physical or chemical factors fall within the range tolerated by a species
  - Organisms can adapt to slowly changing new conditions by acclimation

- c. Too much or too little of any abiotic factor can limit or prevent growth of a population of a species in an ecosystem even if all other factors are at or near the optimum range of tolerance
  - d. There is no such thing as too much fertilizer
14. The most inclusive components of the biotic portion of an ecosystem are
- a. Producers and consumers
  - b. Primary and secondary consumers
  - c. Herbivores, carnivores, and omnivores
  - d. All nonliving chemicals or matter
15. The ecological efficiency at each trophic level of a particular ecosystem is 20%. If the green plants of the ecosystem capture 100 units of energy, about ----- units of energy will be available to support herbivores, and about ----- units will be available to support carnivores
- a. 120 ..... 140
  - b. 120 ..... 240
  - c. 20 ..... 4
  - d. 20 ..... 2
16. The pyramid which best explains why there are typically only four to five links in a food chain is the pyramid of
- a. Energy
  - b. Biomass
  - c. Numbers
  - d. Matter
17. Ammonium ions are converted to nitrite ions and nitrate ions through the process of
- a. Nitrification
  - b. Nitrogen fixation
  - c. Denitrification
  - d. Assimilation
18. The change from a light to a dark color in the peppered moths is an example of
- a. Coevolution
  - b. Industrial pollution
  - c. A change in predators
  - d. An increase in ultraviolet radiation
19. Which of the following adaptations would you least expect to find in desert animals
- a. Live underground during the heat of the day
  - b. Have thick outer coverings to minimize water loss
  - c. Drink and store large amounts of water

- d. Become dormant during periods of extreme heat or drought
20. You read the data records of a field ecologist who reports the following varieties of species: beetles, spiders, grasshoppers, many insects and invertebrates, earthworms, wild dogs, rabbits, squirrels, foxes, hawks, coyotes, meadowlarks. You conclude that the field ecologist is located in a
- Desert
  - Tropical grassland
  - Temperate grassland
  - Arctic tundra

**Total 20 marks**

#### QUESTION TWO

Describe biodiversity in terms of the following concepts

- Speciation (10 marks)
- Extinction (10 marks)

**Total 20 marks**

#### QUESTION THREE

- Describe how climate affect the distribution of plant life on earth. (5 marks)
- Compare the adaptations animals in
  - Savanna (5 marks)
  - Desert (5 marks)
  - Forest (5 marks)

**Total 20 marks**

#### QUESTION FOUR

- Distinguish between coastal and inland wetlands (4 marks)
- Describe the ecological functions performed by wetlands (8 marks)
- Describe four environmental problems associated with coastal and four for inland wetlands (8 marks)

**Total 20 marks**

QUESTION FIVE

1. Distinguish among the following types of stability and give an example of an ecosystem which exemplifies each:
  - a. Inertia (4 marks)
  - b. Constancy (4 marks)
  - c. Resilience (4 marks)
  
2. Evaluate the interaction of stability and diversity. (8 marks)

QUESTION SIX

1. Define infant mortality rate and explain why it is considered a good indicator of quality of life. (6 marks)
2. List four categories that justify the consideration of infectious diseases as emerging or reemerging. (4 marks)
3. Discuss the environmental factors that determine transmission of infectious diseases. (10 marks)

**Total 20 marks**

**GOOD LUCK!!!!**