

UNIVERSITY OF SWAZILAND

Faculty of Health Sciences

(BSC) IN ENVIRONMENTAL HEALTH

FINAL EXAMINATION PAPER 2005

TITLE OF PAPER: ENVIRONMENTAL ECOLOGY

COURSE CODE : EHS 523

DURATION : THREE HOURS

MARKS : 100

INSTRUCTIONS : ANSWER ONLY FIVE QUESTIONS.

: EACH QUESTION CARRY 20 MARKS.

: QUESTIONS ONE AND TWO ARE COMPULSARY.

**: NO QUESTION PAPER SHOULD BE BROUGHT INTO NOR
OUT OF THE EXAMINATION ROOM.**

**: BEGIN EACH QUESTION ON A SEPARATE SHEET OF
PAPER.**

**DO NOT OPEN THIS QUESTION PAPER UNTIL PERMISSION IS GRANTED BY
THE INVIGILATOR.**

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QUESTION ONE:

1. 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

2. A group of individuals of the same species occupying a given area at the same time is called a
 - (a) species
 - (b) population
 - (c) community
 - (d) genus

3. Biodiversity emerges from
 - (a) mutation
 - (b) natural selection
 - (c) extinction
 - (d) all the above

4. The thin gaseous layer of air around the planet is called the
 - (a) atmosphere
 - (b) lithosphere
 - (c) biosphere
 - (d) hydrosphere

5. All physical forms of water make up the
 - (a) atmosphere
 - (b) lithosphere
 - (c) biosphere
 - (d) hydrosphere

6. The lithosphere is made of
 - (a) core and lower mantle
 - (b) core and upper mantle
 - (c) crust and lower mantle
 - (d) crust and upper mantle

7. The most important factor in determining which biome is found in a particular area is
 - (a) soil type
 - (b) topography
 - (c) magnetic fields
 - (d) climate

8. All the following are abiotic factors except
 - (a) light
 - (b) temperature

- (c) pH
- (d) bacteria

9. All of the following factors have strong effects on terrestrial ecosystems except
- (a) temperature
 - (b) precipitation
 - (c) nature of soil
 - (d) dissolved oxygen
10. All of the following are consumers except
- (a) herbivores
 - (b) carnivores
 - (c) autotrophs
 - (d) omnivores
11. In a field, you observe a lion chase, kill, and eat a gazelle. A vulture pecks away at the left over meat scraps. Beetles attack the remaining fragments. Finally, bacteria complete the breakdown and recycling of organic material. If you were to apply a general classification to the feeders, what would be the correct sequence?
- (a) decomposer → scavenger → detritus feeder → carnivore
 - (b) carnivore → detritus feeder → scavenger → decomposer
 - (c) carnivore → scavenger → detritus feeder → decomposer
 - (d) carnivore → scavenger → decomposer → detritus feeder
12. Ecosystem services include
- (a) provision of energy and food sources
 - (b) detoxification of pollutants
 - (c) population control of pests
 - (d) all of these answers
13. You are an ecologist on location in chaparral country. You would be surprised to find
- (a) fires
 - (b) very wet winters
 - (c) evergreen shrubs
 - (d) scrub oak
14. Of the following, ecosystem structure is least likely to include
- (a) species abundance
 - (b) species diversity
 - (c) physical appearance
 - (d) biochemical reactions in the intestines of detritus feeders
15. Species that migrate or are accidentally introduced into an ecosystem are called
- (a) nonnative species
 - (b) native species
 - (c) keystone specie
 - (d) specialist species

16. Prey are least likely to defend themselves against predators by
- (a) camouflage
 - (b) acute senses of sight and smell
 - (c) protective shells
 - (d) pursuit and ambush
17. A relationship in which a member of one species obtains its nourishment by living on, in, or near a member of another species over an extended time is best labeled
- (a) competition
 - (b) predation
 - (c) parasitism
 - (d) mutualism
18. A field ecologist observes primary succession occurring over a period of years. Bare rock is colonized by lichens that give way to moss that give way to ferns. She is most likely to report that the process guiding succession in this ecosystem is
- (a) interspecific competition
 - (b) tolerance
 - (c) facilitation
 - (d) inhibition
19. The immediate effects of a natural disturbance include
- (a) maintaining the status quo and releasing resources
 - (b) changing conditions and releasing resources
 - (c) maintaining the status quo and uptake of resources
 - (d) changing conditions and uptake of resources
20. An r-strategist generally
- (a) has a low biotic potential
 - (b) is small and short lived
 - (c) gives much parental care to its offspring
 - (d) survives to reproduce

TOTAL 20 MARKS

QUESTION TWO:

- (a) Distinguish between the following
 - (i) food chains and food webs (4 marks)
 - (ii) grazing food web and detrital food web (4 marks)
- (b) What three processes sustain life on earth? (2 marks each = 6 marks)
- (c) List three important physical factors and three important chemical factors that have large effects on ecosystems. (6 marks)

TOTAL 20 MARKS

QUESTION THREE:

(a) Distinguish among the following types of stability and give an example of an ecosystem which exemplifies each. (2 marks each = 6 marks)

- (i) Constancy
- (ii) Resilience
- (iii) Inertia

2. Evaluate the interaction of stability and diversity. (14 marks)

TOTAL 20 MARKS

QUESTION FOUR:

- (a) Differentiate between ecological and conventional land-use planning. (4 marks)
- (b) Summarize the four obstacles to more ecological land-use planning. (12 marks)
- (c) List four ways that most European countries have successfully used to discourage urban sprawl and encourage compact cities. (4 marks)

TOTAL 20 MARKS

QUESTION FIVE:

- (a) What are the differences between endangered species and threatened species (4 marks)
- (b) Explain the role of the following on the extinction of species clearly indicating the major types.
 - 1. Habitat loss and degradation (8 marks)
 - 2. Habitat fragmentation (8 marks)

TOTAL 20 MARKS.

QUESTION SIX:

- (a) List ten generalized characteristics of r-selected or opportunist species and k-selected or competitor species and give two examples of each. (10 marks)
- (b) Draw the survivorship curves for populations of different species (4 marks)
- (c) Explain the meaning of the curves. (6 marks)

TOTAL 20 MARKS

GOOD LUCK !!!!