

UNIVERSITY OF SWAZILAND

Faculty of Health Sciences

(BSC) IN ENVIRONMENTAL HEALTH

FIRST SEMESTER SUPPLEMENTARY EXAMINATION PAPER JULY 2014

TITLE OF PAPER : ENVIRONMENTAL ECOLOGY

COURSE CODE : EHM315

DURATION : TWO HOURS

MARKS : 100

INSTRUCTIONS : ANSWER ONLY FOUR QUESTIONS

: EACH QUESTION CARRIES 25 MARKS

: BEGIN EACH QUESTION ON A SEPARATE SHEET OF PAPER

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

QUESTION ONE (Compulsory)

This is a multiple choice question. Write the question number on your answer script and write the letter of the correct answer next to it. Wrongly numbered questions and or unclear letters of the answer will be given a zero mark.

1. 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
2. Large ecological regions with characteristic types of natural vegetation are called
 - a. Ecosystems
 - b. Communities
 - c. Populations
 - d. Biomes
3. Aquatic life zones are the aquatic equivalents of
 - a. Communities
 - b. Ecosystems
 - c. Biomes
 - d. Ecospheres
4. A transitional zone between two ecosystems is called
 - a. A fragile ecosystem
 - b. A biome
 - c. An ecotone
 - d. A buffer zone
5. The biome most likely to be found on the top of a very tall tropical mountain is the
 - a. Desert
 - b. Tundra
 - c. Grassland
 - d. Temperate deciduous forest
6. You are going on a scientific expedition from the equator to the North Pole. As you leave the coniferous forest behind, you anticipate next to explore
 - a. Gases captured in the ice
 - b. The fall of leaves from deciduous forest
 - c. Patterns of cone design in coniferous trees
 - d. The role of lichens and mosses in boggy ecosystems
7. Trees of wet tropical rain forest tend to be
 - a. Succulent plants
 - b. Broad-leaf evergreen plants
 - c. Broadleaf deciduous plants
 - d. Coniferous evergreen plants

8. An explorer seeking the driest place on earth should begin looking in a
 - a. Tundra
 - b. Savanna
 - c. Tropical desert
 - d. Temperate desert
9. If you were exploring a desert ecosystem, which of the following species would you least expect to find?
 - a. Creosote bush
 - b. Popular tree
 - c. Saguaro cactus
 - d. Prickly pear
10. In a chaparral, you are least likely to find
 - a. Plants with large underground root systems
 - b. Mild, slightly wet winters
 - c. Long, hot, dry summers
 - d. Epiphytes and a dense understory
11. Which of the following statements is false?
 - a. 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
 - b. 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
12. Evidence for the evolution of life come from all of the following except
 - a. Chemical experiment
 - b. Fossils
 - c. Chemical analysis of ancient rocks and core samples
 - d. Natural selection
13. Birds and trout make good examples of
 - a. Nonnative species
 - b. Native species
 - c. Keystone species
 - d. Indicator species
14. The ability of a population to maintain a certain size is known as
 - a. Stability
 - b. Inertia
 - c. Constancy
 - d. Resilience

15. The following explains the origin of organic molecules on earth except
- Formation of organic molecules from gaseous inorganic molecules and an energy source
 - Formation of organic molecules around hydrothermal vents in the ocean floor
 - Formation on dust particles in outer space
 - Formation of organic molecules from natural selection
16. A change in the genetic makeup of a population over successive generations is called
- Emigration
 - Mutation
 - Natural selection
 - Evolution
17. The term that describes small genetic changes that a population within a species experiences is
- Coevolution
 - Microevolution
 - Convergent evolution
 - Macroevolution
18. The change from a light to dark color in the peppered moth was the result of
- Insecticides
 - Industrial pollution
 - A change in predation
 - An increase in ultraviolet radiation
19. You study fossils of giraffes. Although there appears to be considerable variability in lengths of necks, there appears to be a definite shift to longer necks over the course of time. You conclude that this species is undergoing
- Continuous natural selection
 - Discontinuous natural selection
 - Disruptive natural selection
 - Directional natural selection
20. When natural selection results in a shift toward the average of a range of genetic expressions for a particular trait, an evolutionary ecologist like you would credit
- Stabilization natural selection
 - Discontinuous natural selection
 - Disruptive natural selection
 - Directional natural selection
21. Which one of the following is false? Coevolution
- Occurs when interacting species exert selective pressure on each other
 - Occurs between plants and the herbivore that eat them
 - May play a role in the evolution of camouflage
 - Leads to competitive relations

22. Species belonging to different taxonomic groups may develop a resemblance resulting from adaptation to similar environments. This process is called
- Coevolution
 - Microevolution
 - Convergent evolution
 - Macroevolution
23. Which of the following is false?
- Genetic diversity helps prevent a species from becoming extinct
 - The phenomenon in which animals with favorable adaptation reproduce more rapidly is called differential reproduction
 - Geographic isolation is a common mechanism contributing to speciation
 - By definition, the fittest animals are the largest and strongest animals
24. Darwin's description of macroevolution as an accumulation of steady, small evolutionary changes is best described as
- Dynamic equilibrium
 - A steady state hypothesis
 - A punctuated equilibrium hypothesis
 - A gradualist model of evolution
25. Biodiversity is believed to be the result of
- Divergent and convergent evolution
 - Speciation and extinction
 - Speciation and coevolution
 - Extinction and coevolution

TOTAL 25 MARKS

QUESTION TWO

Respond to the following:

- With given examples, differentiate between biotic and abiotic environmental factors (4 marks).
- What do you understand by a limiting factor in as far as environmental factors are concerned (2 marks)?
- Mention the two most important limiting factors in an aquatic ecosystem and the two most important limiting factors on a terrestrial ecosystem (4 marks)?
- Define a niche, name two different types of niches, and differentiate amongst them (6 marks).
- How do a niche and a habitat differ (2 marks)?
- In details explain how the predator – prey relations help in regulating populations of the involved species (7 marks)

TOTAL 25 MARKS

QUESTION THREE

1. Distinguish between coastal and inland wetlands and describe the environmental problems associated with coastal and inland wetlands. (15 marks).
2. Distinguish between a specialist and a generalist species. Evaluate the conditions that favor these two approaches. (10 marks).

TOTAL 25 MARKS

QUESTION FOUR

1. Describe how climate affects the distribution of plant life on earth. (9 marks).
2. In a tabular form, indicate the connections (relationships) between the different biomes and the following plants, which are particularly adapted for life in the different biomes: succulent plants, broadleaf evergreen plants, broadleaf deciduous plants, coniferous evergreen plants. (16 marks).

TOTAL 25 MARKS

QUESTION FIVE

1. Why do we need a systems approach to study the environment? What are the types of systems? What are the characteristics of a system? (13 marks)
2. Discuss how energy travels through trophic levels and explain why is this concept very important in environmental management (12 marks)

TOTAL 25 MARKS