

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 1) Which of the following levels of organization is/are correctly ordered? 1) _____
- A) individuals, community, populations, landscape, ecosystem
 - B) biosphere, landscape, individuals, community, populations
 - C) ecosystem, landscape, region, biosphere, populations
 - D) populations, ecosystem, landscape, individuals, community
 - E) individuals, populations, community, ecosystem, landscape
- 2) MacArthur's conclusions that warblers can coexist by feeding in different zones of a single tree was based on: 2) _____
- A) Lab experiments
 - B) Qualitative observations
 - C) Quantitative observations
 - D) Field manipulations
 - E) Natural history
- 3) Ecology is: 3) _____
- A) a science
 - B) a belief
 - C) a lifestyle
 - D) a worldview
 - E) a philosophy
- 4) Which of the following statements about natural history and ecology is correct? 4) _____
- A) Natural history describes the interactions between organisms and their environment, while ecology examines the causes of these interactions.
 - B) Natural history is purely qualitative (descriptions of interactions between organisms and the causes of these interactions), while ecology is purely quantitative (involving measurement and statistical analysis).
 - C) Natural history is the name that used to be given to what is now termed ecology.
 - D) Ecology describes the interactions between organisms and their environment, while natural history examines the causes of these interactions.
 - E) Natural history and ecology are essentially the same thing — they both examine the interactions between organisms and their environment.
- 5) Which of the following is not true of a hypothesis? 5) _____
- A) It can be verified by other researchers.
 - B) It is a potential answer to a research question.
 - C) It is the only answer to a research question.
 - D) It is based on previous observations.
 - E) It is testable through experimentation.

- 6) David Schindler's work in the Experimental Lakes Area of northwestern Ontario showed the value of: 6) _____
- A) large (lake) scale manipulative experiments on ecosystems.
 - B) laboratory experiments in answering questions about nutrients in lakes.
 - C) extrapolating findings from small scale observational studies to a large scale
 - D) careful observational studies conducted at a large scale.
 - E) theoretical modeling of nutrients in lake ecosystems.
- 7) Schindler's studies in the Experimental Lakes Area showed that phosphorus: 7) _____
- A) is often found with CO₂ in the wind.
 - B) is not found in household detergents.
 - C) is often the limiting nutrient in lakes.
 - D) is unimportant in determining the structure and function of a lake ecosystem.
 - E) is not as important as CO₂ in controlling primary productivity in freshwater lakes.
- 8) Ecosystem ecology includes: 8) _____
- A) Biological, physical, and chemical processes
 - B) Biological, physical, and chemical processes and interactions
 - C) Populations and their environments
 - D) Physical and chemical processes and interactions
 - E) Biological and physical processes and interactions
- 9) Physiological ecologists study: 9) _____
- A) mechanisms that influence population structure and dynamics.
 - B) physiological and morphological mechanisms by which organisms deal with variation in their physical and chemical environment.
 - C) the causes of individual behaviours that influence the interaction between individuals and the environment.
 - D) exchanges of materials, energy, and organisms between communities.
 - E) physiological and morphological mechanisms by which organisms deal with variation in their social environment.
- 10) Marie-Josée Fortin uses advanced statistical methods on empirical data to detect: 10) _____
- A) behavioural changes in populations.
 - B) change caused by excess nutrients in lakes.
 - C) declining populations of fish.
 - D) pollen from long ago in lake sediments.
 - E) spatial and temporal patterns in ecosystems.

- 11) Platt and his colleagues at DFO (Canada's Department of Fisheries and Oceans) were not able to sample phytoplankton directly because of the large size of marine systems. What method did they develop instead to estimate changes in phytoplankton abundance? 11) _____
- A) patterns of spectral reflectance from satellite images
 - B) statistical analysis of a section of ocean
 - C) aerial photographs of sea surface
 - D) random sampling of a section of ocean
 - E) directly measuring marine productivity
- 12) An ecosystem is defined as: 12) _____
- A) an association of interacting species.
 - B) all of the organisms that live in an area and the physical environment with which they interact.
 - C) all the organisms that live in an area.
 - D) all of the individuals of a single species that live in an area and the physical environment with which they interact.
 - E) the physical environment with which organisms interact.
- 13) Ernst Mayr's 1942 definition of a species, which is still the standard used in most situations today is: 13) _____
- A) "a group of individuals that is able to interbreed and has introgressed genes"
 - B) "all the organisms that live in an environment and interact with that environment in a similar way"
 - C) "a group of actually or potentially interbreeding populations, reproductively isolated from other such groups"
 - D) "a group of individuals that live in an area having a specific physical environment with which they interact"
 - E) "a group of individuals that is morphologically identical"
- 14) _____ ecology involves the study of nutrient cycling, energy flow and organisms within a given system, whereas _____ ecology is the study of material, energy, and organism exchanges across systems. 14) _____
- A) Ecosystem; population
 - B) Ecosystem; landscape
 - C) Landscape; ecosystem
 - D) Population; landscape
 - E) Population; community
- 15) The areas between different types of ecosystems are referred to as _____. 15) _____
- A) ecosystem transitions
 - B) ecological boundaries
 - C) ecotones
 - D) ecosystem boundaries
 - E) transition zones

- 16) The process of _____ results in greening of previously clear lakes. 16) _____
- A) fragmentation
 - B) sedimentation
 - C) eutrophication
 - D) acidification
 - E) fertilization
- 17) Which of the following statements would **not** be considered a hypothesis? 17) _____
- A) How can several species of insect-eating warblers live in the same forest without one species eventually excluding the others through competition?
 - B) Increased phosphorus, not nitrogen, is responsible for eutrophication in lakes.
 - C) Increased primary productivity in freshwater lakes is driven by increased nitrogen.
 - D) Several warbler species are able to coexist because each species feeds on insects at different times within trees.
 - E) Numerous warbler species are able to coexist in spruce forests because each species feeds on insects living in different zones within trees.
- 18) An ecologist hypothesizes that disease spreads through dense populations faster than through sparse populations. The null hypothesis would be: 18) _____
- A) Disease spreads equally quickly through both dense and sparse populations.
 - B) Disease spreads only through populations of certain species but not through others.
 - C) The spread of disease is limited by the number of pathogens (viruses, bacteria, etc.) in the population.
 - D) Disease does not spread through populations that have an immunity to the pathogen.
 - E) Disease spreads through dense populations faster than through sparse populations.
- 19) Which of the following is the correct sequence of the scientific method? 19) _____
- A) ask questions, develop prediction, develop hypothesis, collect data to test prediction
 - B) ask questions, develop hypothesis, develop prediction, collect data to test hypothesis
 - C) ask questions, develop prediction, develop hypothesis, collect data to test hypothesis
 - D) ask questions, develop hypothesis, collect data to test hypothesis
 - E) ask questions, develop prediction, collect data to test prediction

- 20) Which of the following is **incorrect** about the Experimental Lake Area? 20) _____
- A) Dr. Schindler's research in ELA illustrated that phosphorus is the driver of eutrophication effects.
 - B) It houses 46 lakes within 17 watersheds, many of which are used for whole lake manipulations.
 - C) Dr. David Schindler was the leader of experimental investigations upon establishment of the facility.
 - D) It was established in the 1980s.
 - E) The first experiments in ELA were manipulations of whole lakes to determine which nutrients are linked to eutrophication effects.

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

- 21) Pollen cores from lake sediments can be used to reconstruct the paleoecological record. 21) _____
- 22) Natural history is about knowing the history of a biome. 22) _____
- 23) MacArthur observed that warblers maintain differences in feeding zones. 23) _____
- 24) Field studies and laboratory studies are mutually exclusive. 24) _____
- 25) The word ecology comes from the Greek word for world. 25) _____
- 26) Stable isotopes decay radioactively. 26) _____
- 27) Margaret Davis' studies on lake pollen sediments indicate that the forests of eastern North America did not change with the changing climate. 27) _____
- 28) The scientific method is used to prove a hypothesis. 28) _____
- 29) The scientific method deals with absolute truths. 29) _____
- 30) Ecology can be defined as the study of the impact of human activity on the environment. 30) _____
- 31) The Experimental Lakes Area (ELA) is like a real-world laboratory where the natural system can be manipulated. 31) _____
- 32) Quantitative ecological studies are often preceded by qualitative natural history observations. 32) _____
- 33) David Schindler showed that human waste water often affects the functioning of natural lakes by adding excess nutrients. 33) _____

- 34) The research done by Ryan Norris on American redstart indicated that sex and age are two important determinants of where an individual will overwinter in Jamaica. 34) _____
- 35) The dispersal of the guanacaste tree's (*Enterolobium cyclocarpum*) seeds was performed by herbivores that have since become extinct; consequently, the tree is now on the verge of extinction. 35) _____

Answer Key

Testname: UNTITLED1

- 1) E
- 2) C
- 3) A
- 4) A
- 5) C
- 6) A
- 7) C
- 8) B
- 9) B
- 10) E
- 11) A
- 12) B
- 13) C
- 14) B
- 15) C
- 16) C
- 17) A
- 18) A
- 19) B
- 20) D
- 21) TRUE
- 22) FALSE
- 23) TRUE
- 24) FALSE
- 25) FALSE
- 26) FALSE
- 27) FALSE
- 28) FALSE
- 29) FALSE
- 30) FALSE
- 31) TRUE
- 32) TRUE
- 33) TRUE
- 34) TRUE
- 35) FALSE