

Exam
Name _____

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) ecosystem, landscape, region, biosphere, populations
B) individuals, populations, community, ecosystem, landscape
C) biosphere, landscape, individuals, community, populations
D) individuals, community, populations, landscape, ecosystem
E) populations, ecosystem, landscape, individuals, community
- 2) MacArthur's conclusions that warblers can coexist by feeding in different zones of a single tree was based on: 2) _____
A) Quantitative observations
B) Lab experiments
C) Field manipulations
D) Qualitative observations
E) Natural history
- 3) Ecology is: 3) _____
A) a philosophy
B) a belief
C) a worldview
D) a science
E) a lifestyle
- 4) Which of the following statements about natural history and ecology is correct? 4) _____
A) 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).
B) Natural history is the name that used to be given to what is now termed ecology.
C) Ecology describes the interactions between organisms and their environment, while natural history examines the causes of these interactions.
D) Natural history describes the interactions between organisms and their environment, while ecology 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.

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- 5) Which of the following is not true of a hypothesis? 5) _____
- A) It is a potential answer to a research question.
 - B) It is based on previous observations.
 - C) It is the only answer to a research question.
 - D) It can be verified by other researchers.
 - 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) theoretical modeling of nutrients in lake ecosystems.
 - B) careful observational studies conducted at a large scale.
 - C) laboratory experiments in answering questions about nutrients in lakes.
 - D) large (lake) scale manipulative experiments on ecosystems.
 - E) extrapolating findings from small scale observational studies to a large scale
- 7) Schindler's studies in the Experimental Lakes Area showed that phosphorus: 7) _____
- A) is not found in household detergents.
 - B) is often found with CO₂ in the wind.
 - C) is not as important as CO₂ in controlling primary productivity in freshwater lakes.
 - D) is unimportant in determining the structure and function of a lake ecosystem.
 - E) is often the limiting nutrient in lakes.
- 8) Ecosystem ecology includes: 8) _____
- A) Biological, physical, and chemical processes
 - B) Biological and physical processes and interactions
 - C) Physical and chemical processes and interactions
 - D) Biological, physical, and chemical processes and interactions
 - E) Populations and their environments
- 9) Physiological ecologists study: 9) _____
- A) exchanges of materials, energy, and organisms between communities.
 - B) physiological and morphological mechanisms by which organisms deal with variation in their social environment.
 - C) the causes of individual behaviours that influence the interaction between individuals and the environment.
 - D) mechanisms that influence population structure and dynamics.
 - E) physiological and morphological mechanisms by which organisms deal with variation in their physical and chemical environment.

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- 10) Marie-Josée Fortin uses advanced statistical methods on empirical data to detect: 10) _____
- A) pollen from long ago in lake sediments.
 - B) declining populations of fish.
 - C) spatial and temporal patterns in ecosystems.
 - D) change caused by excess nutrients in lakes.
 - E) behavioural changes in populations.
- 11) Platt and his colleagues at DFO (Canada's Department of Fisheries and Oceans) were not 11) _____
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?
- A) aerial photographs of sea surface
 - B) random sampling of a section of ocean
 - C) directly measuring marine productivity
 - D) patterns of spectral reflectance from satellite images
 - E) statistical analysis of a section of ocean
- 12) An ecosystem is defined as: 12) _____
- A) all of the organisms that live in an area and the physical environment with which they interact.
 - B) an association of interacting species.
 - C) the physical environment with which organisms interact.
 - D) all of the individuals of a single species that live in an area and the physical environment with which they interact.
 - E) all the organisms that live in an area.
- 13) Ernst Mayr's 1942 definition of a species, which is still the standard used in most 13) _____
situations today is:
- A) "a group of individuals that live in an area having a specific physical environment with which they interact"
 - B) "a group of individuals that is able to interbreed and has introgressed genes"
 - C) "a group of individuals that is morphologically identical"
 - D) "a group of actually or potentially interbreeding populations, reproductively isolated from other such groups"
 - E) "all the organisms that live in an environment and interact with that environment in a similar way"
- 14) _____ ecology involves the study of nutrient cycling, energy flow and organisms 14) _____
within a given system, whereas _____ ecology is the study of material, energy, and
organism exchanges across systems.
- A) Landscape; ecosystem
 - B) Ecosystem; landscape
 - C) Population; community
 - D) Ecosystem; population
 - E) Population; landscape
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- 15) The areas between different types of ecosystems are referred to as _____. 15) _____
- A) ecological boundaries
 - B) ecosystem transitions
 - C) ecotones
 - D) transition zones
 - E) ecosystem boundaries
- 16) The process of _____ results in greening of previously clear lakes. 16) _____
- A) sedimentation
 - B) eutrophication
 - C) fertilization
 - D) acidification
 - E) fragmentation
- 17) Which of the following statements would **not** be considered a hypothesis? 17) _____
- A) Increased primary productivity in freshwater lakes is driven by increased nitrogen.
 - B) Several warbler species are able to coexist because each species feeds on insects at different times within trees.
 - C) Increased phosphorus, not nitrogen, is responsible for eutrophication in lakes.
 - D) How can several species of insect-eating warblers live in the same forest without one species eventually excluding the others through competition?
 - 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 does not spread through populations that have an immunity to the pathogen.
 - B) Disease spreads only through populations of certain species but not through others.
 - C) Disease spreads equally quickly through both dense and sparse populations.
 - D) The spread of disease is limited by the number of pathogens (viruses, bacteria, etc.) in the population.
 - 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 hypothesis
 - B) ask questions, develop hypothesis, develop prediction, collect data to test hypothesis
 - C) ask questions, develop hypothesis, collect data to test hypothesis
 - D) ask questions, develop prediction, develop hypothesis, collect data to test prediction
 - E) ask questions, develop prediction, collect data to test prediction
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- 20) Which of the following is **incorrect** about the Experimental Lake Area? 20) _____
- A) It houses 46 lakes within 17 watersheds, many of which are used for whole lake manipulations.
 - B) The first experiments in ELA were manipulations of whole lakes to determine which nutrients are linked to eutrophication effects.
 - C) Dr. David Schindler was the leader of experimental investigations upon establishment of the facility.
 - D) It was established in the 1980s.
 - E) Dr. Schindler's research in ELA illustrated that phosphorus is the driver of 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) _____

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- 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) B
- 2) A
- 3) D
- 4) D
- 5) C
- 6) D
- 7) E
- 8) D
- 9) E
- 10) C
- 11) D
- 12) A
- 13) D
- 14) B
- 15) C
- 16) B
- 17) D
- 18) C
- 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