

SBI3U Unit 1 Test: Biodiversity
(50 Marks Total)

Name: _____

Signature: _____

Marks obtained:

Category	Total Marks	Possible Marks
Knowledge/Understanding (K/U)		10
Thinking/Investigation (T/I)		20
Communication (C)		10
Application (A)		10
Total		50
Percentage		

SECTION 1: Knowledge/Understanding - Multiple Choice (Questions 1-10)*[K/U, 10: 1 each]***Write your section 1 answers here:**

Question	1	2	3	4	5	6	7	8	9	10
Answer										

K/U	T/I	A	C
/10			

****NOTE: FOR SECTIONS 1 WRITE YOUR ANSWERS IN THE TABLES ON THE FIRST PAGE OF THIS TEST****

SECTION 1: Knowledge/Understanding - Multiple Choice (Questions 1-10)

[K/U, 10: 1 each]

1. Which kingdom has species whose cells do not have cell walls?

a) Animalia	c) Archaea	e) Bacteria
b) Plantae	d) Protista	

2. Which term describes an identification tool that uses a series of two-part choices?

a) binomial nomenclature	d) phylogenetic key
b) dichotomous key	e) taxonomic key
c) phylogenetic tree	

3. In which kingdom would you place an organism that is multicellular, has a cell wall made of cellulose, and is autotrophic?

a) Bacteria	c) Protista	e) Fungi
b) Archaea	d) Plantae	

4. What do *Balantidium coli*, a parasitic protist, and the most common cause of bacterial pneumonia, *Streptococcus pneumoniae*, have in common?

a) both are prokaryotic cells
b) both contain DNA
c) both have membrane-bound organelles
d) both have a membrane-bound nucleus
e) both use mitosis and meiosis for cell division

5. Which theory does the evidence listed below support?
- Membranes of the chloroplasts and mitochondria are similar to living prokaryotes.
 - Ribosomes in chloroplasts and mitochondria are similar to ribosomes in prokaryotes.
 - Mitochondria and chloroplasts reproduce by binary fission.
 - Chloroplasts and mitochondria have a circular chromosome.
- a) endospore theory
b) endosymbiotic theory
c) theory that Archaea carry out photosynthesis
d) theory of how eukaryotes became multicellular
e) theory that viruses are cells
6. Some scientists study how the fang mechanism of cobras differs from the fang mechanism of rattlesnakes. Other scientists study how the wings of bats evolved from the forelimbs of their ancestors. In both cases, what are these scientists studying?
- a) the biodiversity of these animals
b) the species diversity of these animals
c) the nomenclature of these animals
d) the taxonomy of these animals
e) the morphology of these animals
7. Which would least likely be used to determine how closely two organisms are related?
- a) anatomical evidence using fossils
b) developing scientific models using biodiversity data
c) anatomical evidence from living species
d) physiological evidence, such as protein structure
e) DNA evidence from living or dead organisms
8. The name of this taxonomic tool used to narrow down the identity of an organism comes from two Greek words that together mean “divided in two parts.”
- a) dichotomous key
b) binomial nomenclature
c) biological species concept
d) phylogenetic species
e) bilateral symmetry

9. Which statement about species diversity is false?
- a) Species diversity is the variety and abundance of species in a given area.
 - b) Ecosystems with high species diversity have less resilience to disease or harsh environmental conditions than ecosystems with low species diversity.
 - c) Pollution and climate change are possible threats to species diversity.
 - d) The introduction of a non-native species to an ecosystem can lead to a decrease in species diversity.
 - e) Carolinian Canada is an ecosystem that has high species diversity.
10. Which term describes the variety of internal and external forms in living organisms?
- a) ecosystem diversity
 - b) structural diversity
 - c) genetic diversity
 - d) species diversity
 - e) biological diversity

SECTION 2: Thinking/Inquiry – Labeling (Question 11)

11. Based on the partial key below, predict the order of the mammal shown below and identify the steps you used in this key by circling it to arrive at your decision. [T/I, 5]

Partial Key to the Orders of Mammals

1a. Forelimbs developed into leathery wings Order Chiroptera
1b. Forelimbs not developed into wings; go to 2
2a. Front limbs developed into paddle-like flippers, hind limbs absent, body ending in expanded horizontal fluke, hairless or nearly hairless body Order Cetacea
2b. Front and hind limbs present, body not ending in horizontal, expanded fluke, body covered with hair; go to 3
3a. Front and hind limbs developed into flippers for swimming Order Pinnipedia
3b. Front and hind limbs not developed into flippers for swimming; go to 4
4a. Toes ending in hooves, four toes on each foot Order Artiodactyla
4b. Toes ending in hooves, odd number of toes on each foot Order Perissodactyla



The order of this mammal is:

K/U	T/I	A	C
	/5		

SECTION 3: Thinking/Inquiry, Application & Communication – Short Answer
(Questions 12 – 18)

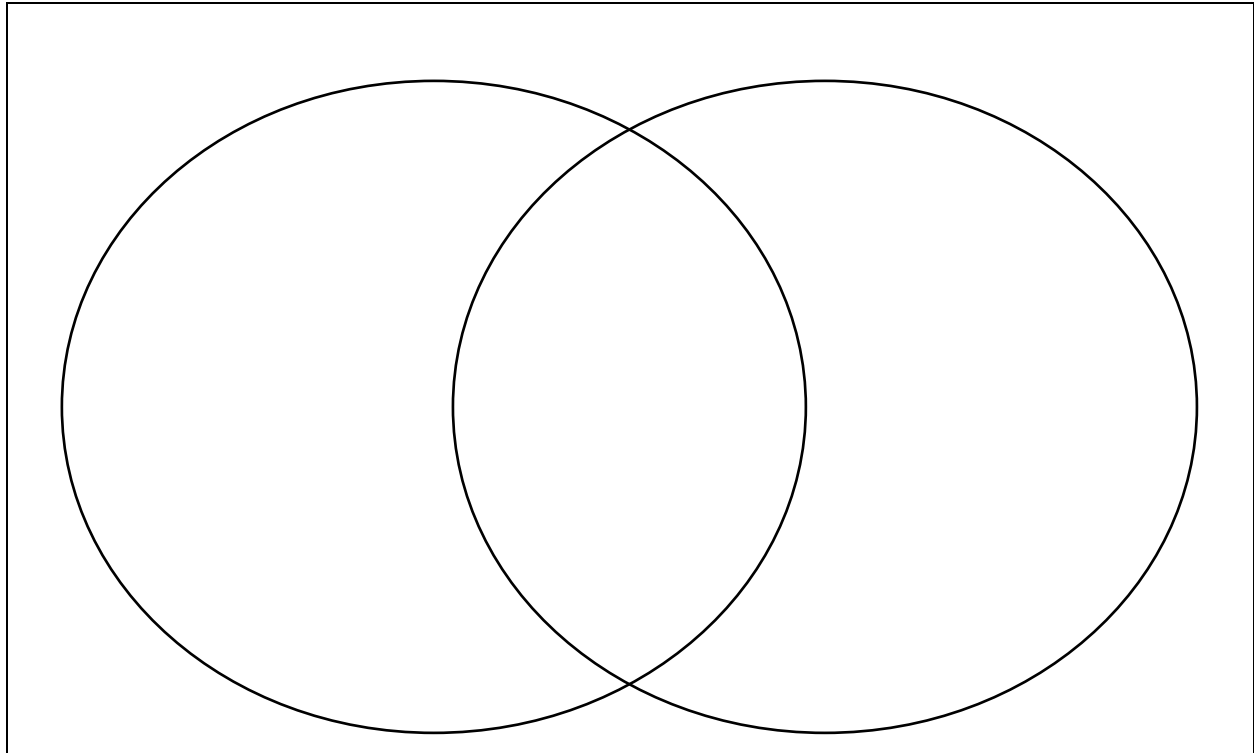
[30 total: T/I, 11; A, 19]

12. The Trans-Canada Highway runs through Banff National Park in Alberta. The highway splits the park into two separate areas, fragmenting the habitat of the bears that live in the park: grizzly bears (*Ursus arctos*) and black bears (*Ursus americanus*). As well, fences have been constructed on either side of the highway to protect wildlife from motor vehicles. However, a variety of wildlife crossing structures (overpasses and underpasses) have been constructed to try to reduce the impact of fragmenting the bears' habitat.
- Identify the level of biodiversity that is most affected by the combination of a major highway and fences. Explain your reasoning.
 - Infer how the wildlife crossing structures help reduce the impact of fragmentation on these animals. Explain your reasoning *[T/I, 5]*

13. Draw a phylogenetic tree that shows the following scenario. Bacteria and Archaea diverged from a common ancestor relatively soon after life began on Earth. Later, Eukarya split off from the archaeal line, implying that Eukarya are more closely related to Archaea than to Bacteria. *[C, 5]*

K/U	T/I	A	C
	/5		/5

14. Write at least 3 difference and two similarities between prokaryotic and eukaryotic cells in the Venn Diagram below. [C, 5]



15. Tigers and zebras are both mammals with striped fur coats. [A, 5]
 a) Why is this characteristic not useful in determining the closeness of their evolutionary relationship?
 b) State two other pieces of evidence that would be a better for establishing relationship among species.

K/U	T/I	A	C
		/5	/5

16. Put these Latin names in order from most general to most specific:

- order — Perciformes (a)
- class — Actinopterygii (b)
- kingdom — Animalia (c)
- phylum — Chordata (d)
- species — tridigitatus (e)
- family — Dactyloscopidae (f)
- genus — Dactyloscopus (g)

The organism you have classified is a fish called a sand stargazer. What is its scientific name? [T/I, 5]

17. Most mine wastewater is contaminated with heavy metals and, due to the presence of sulfur in the mined rock, extremely acidic. Based on this information, predict the type of organisms that could survive in this environment, and predict the kingdom that they are likely classified in. Explain your reasoning. [A, 5]

K/U	T/I	A	C
	/5	/5	

18. Pollination is an essential part of a healthy ecosystem. A phenomenon called “colony collapse disorder” has led to the disappearance of millions of adult bees and beehives around the world. Predict the impact of the disappearance of bees or other pollinators on the organisms that depend on this ecosystem service. Explain your reasoning. *[T/I, 5]*

K/U	T/I	A	C
	/5		