Module 2 ECOSYSTEMS

1. Differentiate between a population and a community:

	Define	Example
Population		
Community		

2. Organisms that make their own food from chemicals in their environment are called _____ or _____ They include _____ (on land), _____ & _____ (near shorelines), and _____ (in open water).
3. The overall chemical equation for photosynthesis is:

4. Identify and describe the process used by type of producers that do not use sunlight.

_____

_____

_____

_____

5. Organisms that get energy and nutrients by feeding on other organisms or their remains are called _____ or _____. Define that give an example of the following types of these organisms:

	Define	Examples
Herbivores		
Carnivores		
Omnivores		
Decomposers		
Detritivores		

6. Plants, animals and decomposers use chemical energy stored in glucose in a process called cellular respiration. The overall chemical equation for cellular respiration is:

7. Match the organism type to the trophic level/s (may be used more than once):

3rd trophic level: _____
2nd trophic level: _____
1st trophic level: _____

A. Autotroph
B. Heterotroph
C. Herbivore
D. Carnivore
E. Omnivore
F. Detritivore
G. Producer
H. Primary consumer
I. Secondary consumer

8. Discuss the relationship between biomass, ecological efficiency and the pyramid of energy flow and explain why food chains rarely have more than five trophic levels?

_____
_____
_____
_____
_____
_____

9. Define the first law of thermodynamics and discuss its significance in environmental science.

_____
_____
_____
_____
_____
_____

10. Define the second law of thermodynamics and discuss its significance in environmental science.

_____
_____
_____
_____
_____
_____

11. Energy (flows one way / cycles) through ecosystems. Energy (can / cannot) be recycled.
12. Matter (flows one way / cycles) through ecosystems. Matter (can / cannot) be recycled.
13. How humans are impacting the hydrologic cycle? What are the major process of the hydrologic cycle?

14. Describe & discuss the steps/reactions in the carbon cycle.

15. How are humans impacting the carbon cycle?

16. Describe & discuss the steps (give reactions) in the nitrogen cycle:
    - Nitrogen fixation -
    - Nitrification -
    - Assimilation -
    - Ammonification -
    - Denitrification -
17. How are humans impacting the nitrogen cycle?
    -
    -
    -
    -
18. What is the major reservoir of phosphorus in the environment? _____ How are humans impacting the phosphorus cycle?
    -
    -

19. Why is phosphate often a limiting factor?

20. What is the major reservoir of sulfur in the environment? _____ How are humans impacting the sulfur cycle?
    -
    -
21. Key Chemical Reaction of the Sulfur Cycle
22. Use the chart to list and describe three characteristics used to describe a biological community.

Characteristic	Description

23. What is the difference between a fundamental vs. a realized niche?

24. How does the competitive exclusion principle control competition?

25. Explain how predation benefits populations of prey species.

26. Contrast parasitism, mutualism, and commensalism

Interaction	Definition	2 examples
Parasitism		
Mutualism		
Commensalism		

27. Contrast native, nonnative, indicator, keystone and foundation species by completing the chart.

	Description	Example(s)
Native		
Nonnative (Invasive)		
Indicator		
Keystone		

28. The gradual change in species composition of a given area is called _____.

29. Distinguish between primary and secondary succession. Be detailed and specific in your comparisons.

Primary succession	Secondary succession

30. Describe how environmental disturbances can be beneficial to ecosystems. Give examples.

31. What three conditions are necessary for evolution of a population through natural selection?
    -
    -
    -
32. Explain and give an example of coevolution.
33.
34. What is the difference is between geographically and reproductively isolated?

35. What is genetic drift? How does it differ from genetic bottleneck?

36. What are reasons a species might go extinct?

37. Extinction that occurs at a low rate as local environmental conditions change is called _____ extinction. Based on fossil records, it is estimated that the average rate is _____ to ____ species for every _____ species on Earth.
38. Catastrophic, widespread event in which large groups of existing species are wiped out is called _____ _____.
39. Periods of time in which extinction rates are higher than normal but not high enough to classify as a mass extinction are classified as periods of _____ _____.
40. When many new species evolve to fill new or vacated ecological roles or niches in changed environments, it is said _____ _____ has occurred.
41. Extinction is a (natural/man-made) process.
42. What is an ecotone?
43. Describe the edge effect and its effect on species living in the area.

44. When considering biodiversity of an area, what two components do scientists look at? Explain them.
    - .
    - .
45. What are ways to conserve biodiversity?
    -
    -
    -
    -
    -