The Living World Review Packet

Part 1: Surface Layer

3.1 Information: Changes in organisms

1. **Be familiar with the different types of species listed below.** What are some examples discussed in class?
    i. **Generalist**
    ii. **Specialist**
    iii. **Invasive**
    iv. **Keystone**
    v. **Indicator**
    vi. **Endemic**
    vii. **Endangered**
    viii. **Extirpate**
2. Define the following:
    i. Evolution (convergent and divergent)
    ii. Natural Selection
    iii. Artificial Selection (who selects for the traits?)
    iv. Allopatric Speciation versus Sympatric Speciation (how can it occur?)
    v. Resource Partitioning
3. Understand how biodiversity, competition for limiting factors (resources, space, weather, mates), and random mutations contribute to **evolution**.
4. Know the four requirements for natural selection:
    i. overproduction of offspring
    ii. competition resulting in favorable trait
    iii. variation of the trait
    iv. trait must be heritable (in DNA passed to offspring)
5. Be able to graph and identify the three types of natural selection: stabilizing, disruptive, and directional.
6. Define the term biodiversity. What are characteristics of areas with areas of high biodiversity?
7. **Explain why biodiversity leads to healthy ecosystems. (think of disease and natural disturbances)**
8. Be able to use and define biodiversity equations: Richness, Evenness, Shannon diversity index
9. Explain why specialists are more susceptible to extinction than generalist species.
10. Be able to describe the four ecosystem services and where biodiversity fits.
11. Describe anthropogenic events that have led to extinction.
    i. one example discussed was **habitat fragmentation**
12. Explain the Island Biogeography Theory and provide supporting evidence (Hawaiian and Galapagos islands)
13. What is CITES? What is the Endangered Species Act?
14. What is conservation biology?
15. Compare and contrast the fundamental niche and the realized niche.

3.2: Changes in Ecosystems

16. Explain when primary succession would occur. When would secondary succession occur?
    i. Define pioneer species and a climax community.
17. Define an indicator species and regime shift.
18. Explain the difference between adaptation and acclimation.
19. What is restoration ecology?
20. Be familiar with the Comprehensive Everglades Restoration Plan and its goals for restoration. Also, understand how humans have negatively impacted the Florida Everglades.

**** Don't forget dimensional analysis math!***

Part 2: Multiple Choice

1. Which of the following sequences of secondary succession would be likely to occur in abandoned farmland in the eastern United States?

(a) Bare soil, lichens, mosses, grasses, deciduous trees
(b) Bare rock, lichens, mosses, grasses, shrubs, mixed shade- and sunlight-tolerant trees
(c) Bare soil, grasses and wildflowers, shrubs, shade-tolerant trees
(d) Bare soil, grasses and wildflowers, shrubs, sunlight-tolerant trees, shade-tolerant trees
(e) Bare rock, grasses and wildflowers, lichens, mosses, shrubs, coniferous trees

2. Which of the following is NOT a part of the process of natural selection?
a) Once grown, organisms generally do not have to struggle to survive.
b) Organisms produce more young than can survive.
c) Individuals vary in their genetic characteristics.
d) Some individuals are better suited to their environment than others.

3. What happens as a result of adaptation?
(a) Species have lower reproductive success and lower survival.
(b) Species have higher reproductive success and higher survival.
(c) Species have higher reproductive success and lower survival.
(d) Species have lower reproductive success and higher survival.

4. Directional selection would result in which of the following?
(a) Dogs with black coats evolving whiter coats in colder areas
(b) Red and white flowers interbreeding, producing pink flowers
(c) Fish evolving bigger eyes as the water gets muddier
(d) A population of birds, some with thicker beaks that eat seeds and others with thinner beaks that eat insects.

5. Allopatric speciation would occur in:
(a) one population that mates in May and another that mates in June.
(b) two populations separated by the Mississippi River.
(c) one population that feeds in tree branches and another that feeds on tree trunks.
(d) a population with a mutation that turns fur a different color than usual.

6. Which of the following statements about extinction is true?
(a) Extinctions have only started now that humans are changing the planet.
(b) Extinction of one species never benefits any other organisms in a community.
(c) The vast majority of species that have ever existed are now extinct.
(d) Extinction rates stay at a constant background rate and never change.

7. Which of these species is MOST vulnerable to extinction?
(a) A species whose crude death rate is lower than its crude birth rate
(b) A species distributed in one county of the United States
(c) A species that eats many different plant species
(d) A species that has hundreds of offspring

8. A community is defined as:
   (a) the total of living things on Earth.
   (b) members of the same population that can interbreed.
   (c) interacting species in an area.
   (d) species and the nonliving material they interact with.

9. Primary succession would take place on all of the following EXCEPT
   (a) the slopes of a newly formed volcanic island.
   (b) a forest in northwest Oregon after it had been logged.
   (c) a receding glacier.
   (d) a drying lake.

10. Because communities can undergo phase (regime) shifts, we must remember that
   (a) secondary succession results in a predictable series of stages.
   (b) we can count on being able to reverse damage caused by human disturbance.
   (c) we cannot count on being able to reverse damage caused by human disturbance.
   (d) changes humans set in motion will not be permanent.