Highly Outlined Study Guide (major topics and ideas)

I. Introduction

A. What is Ecology?

Terms and Definitions
Important persons and their contributions

B. Levels of organization

1. Biosphere-"Living" part of earth
2. Ecosystem- A natural unit containing biotic and abiotic components that interact in a complex series of interdependent pathways.
3. Community- An assemblage of populations occupying a defined area.
4. Population- A group of individuals of the same species occupying a definable area.
5. Species- A group of organisms that can actually or potentially interbreed and produce fertile offspring.
6. Individuals
   a) Organ systems
   b) Tissues
   c) Cells
   d) Organelles
   e) Molecules

C. Selection Species concepts

1. Selection factors
2. Fitness
3. Modes of selection
   a) Stabilizing
   b) Directional
   c) Disruptive
4. Sources of variation
5. Species concept
6. Ecological Niche'
   a) Spatial
   b) Trophic
   c) Multidimensional hypervolume
   -Fundamental
   -Realized
7. Geographical Variation
   a) Clines
   b) Ecotypes or step clines
   c) Geographic isolates

D: Photosynthesis Tissue types, Pathways, Constraints, and Consequences
Distributions

1. C-3
2. C-4
3. CAM

II Physical Environment

A. Climate

1. Global Heat Budget
2. Atmospheric movements
3. Air Inversions
a) Radiation inversion
b) Subsidence inversion
4. Global circulation patterns and process
5. Precipitation patterns
6. Microclimates of life

B. Habitats

1. Tolerance limits
2. Limiting factors

C. Light

a) Quality Distribution and spectra
b) Intensity amouts and fates on entry to atmosphere
c) Duration (summer and winter ) equatorial consequences
d) LAI
e). Shade and sun forms and rates of photosynthesis LCP and LSP
f) ALGA distribution turbidity and light penetration

D. Temperature

a) Heat exchange
-Conduction
-Convection
-Evaporation
-Thermal radiation
-Metabolic heat
b) Thermal classification
-Endothermy
-Ectothermy

c) Metabolic Rate
d) Thermo-regulation by animals
-Behavioral/avoidance
.bask/hide cycles
.diapause
.hibernation
.prolonged sleep
.daily torpor
.estivation
e)-Morphological mechanisms
.insulation
f)-Physiological mechanisms
.metabolic heat generation
.evaporative cooling
.hyperthermia
.cold tolerance
.counter current circulation
.capillary radiation
g) Thermo-regulation by plants

E. Water molecular properties and principles

F) Humidity
-Absolute
-Relative
-Dew Point
b) Plant relations
c) Animal relations
d) Hydrologic cycle
-World water supply
-Global precipitation budget
-Local water cycle
-Continental precipitation patterns
-Global precipitation patterns

F. Circannual and Circadian properties

a) biological clock
b) rhythms and endocrine connections
c) mechanisims days, tides, years, seasons

G. Soils

H. Minerals & nutrients