BIO 20 – REVIEW FOR EXAM 2

revised Sp05

Exam includes multiple-choice and matching questions. ***No*** electronic devices or dictionaries are permitted. Only ***one*** exam may be made-up for a legitimate medical or legal emergency if accompanied by official verifiable documentation; the make-up exam will include additional short essay questions and must be scheduled within one week. All testing accommodations must follow pre-approved DSPS guidelines.

SYMBIOSES: COMPETITION & MUTUALISM

1. Identify the various symbioses, the +/0/- notation, and a realistic example for each.
2. Summarize Gause's competitive exclusion principle and the role of resource partitioning and microhabitats.
3. Describe the impact of competition and mutualism on the dN/dt population growth equation.
4. Describe different examples of mutualism, including those involving bacteria, plants (including lichen & symbiotic green algae), and animals.
5. Distinguish the following terms: interspecific & intraspecific competition; exploitation & interference competition; fundamental & realized niches; niche overlap & breadth; obligatory & facultative mutualism; nitrogen-fixing & bioluminescent bacteria; herbivory, frugivory, nectivory, cleaners, followers.

SYMBIOSES: PREDATION & PARASITISM

1. Describe the long-term benefits of predation to prey populations, and of herbivory to plant species.
2. Describe how predators may oscillate with prey populations, and how they adapt their search images.
3. Describe the various factors in determining an optimal diet and an optimal foraging efficiency.
4. Describe the defensive strategies exhibited by prey populations to avoid predation and herbivory.
5. Identify how parasitism and herbivory differ from the usual predation.
6. Describe different examples and the adaptations of parasites, parasitoids, and brood parasites.
7. Distinguish the following terms: ambush, stalk, & pursuit predation; cryptic & warning coloration, countershading, Müllerian & Batesian mimicry, eyespots, schooling, nocturnal, prime life cycles; microparasite, ectoparasite, endoparasite.

COMMUNITIES: DIVERSITY

1. Define a community and identify the nature and niche of the dominant species.
2. Describe the diversity found in vertically-layered forests and oceans, ecotones, and habitat islands.
3. Describe the different reasons why terrestrial tropical communities possess high biodiversity.
4. Distinguish the following terms: species diversity, richness, & evenness; spatial, temporal, & trophic niches; vertical layering, canopy, understory, shrub & herbaceous layers, forest floor.

COMMUNITIES: SUCCESSION

1. Describe the sere in succession (from pioneer to climax), including the changes in plant and animal life.
2. Compare the energy flow, nutrients, plant life, and seeds in pioneer versus climax communities.
3. Describe the development of soil, productivity, regulation, resilience, and diversity during succession.
4. Describe the natural sources of fire and its ecological benefits and role in succession.

ECOSYSTEMS: ENERGY & CYCLING

1. Identify the source of all energy in earth and the contrasting nature of flow versus cycle.
2. Compare the primary productivity of various terrestrial and marine habitats.
3. Provide realistic examples of food chains, food pyramids, and food webs.
4. Characterize the number of levels in a food pyramid and the energy transferred between levels.
5. Identify the reservoir and pathways in the biogeochemical cycles for water, carbon, and nitrogen.
6. Distinguish the following terms: ecosystem, community, abiotic component; autotroph, producer, photosynthesis, chemosynthesis, heterotroph, consumer, herbivore, carnivore, omnivore, scavenger, decomposer; primary & secondary productivity; pyramid of numbers, pyramid of biomass.

ECOSYSTEMS: ABIOTIC FACTORS

1. Identify the dispersion of the sunlight that reaches the atmosphere and the earth's surface.
2. Describe how topography (valleys, north- & south-facing slopes) can influence the microclimate.
3. Compare the differences in microclimate between urban and natural landscapes.
4. Distinguish the following terms: homeostasis, laws of minimum & tolerance; greenhouse effect, absolute humidity; circadian, tidal, lunar, & annual periods, seasons; soil, clay, silt, sand, gravel, loam; adiabatic rainfall, rain shadow.

CULTURAL ECOLOGY

1. Describe why traditional low-energy cultures can be considered the basic mode of human existence.
2. Describe the lifestyle, fertility control, and acculturation experienced by hunters-gatherers.
3. Identify the sources of pollution and other environmental problems facing industrial society.
4. Describe the demographic transition hypothesis and its implications for current global situation.