

Terms and essay questions for Exam one:

Terms:

Chapter 1. Ecology, ecosystem, population, community, hypothesis, model

Chapter 2. Adaptations, natural selection, fitness, directional selection, disruptive selection, stabilizing selection, DNA, genes, alleles, homozygous, heterozygous, dominance, incomplete dominance, genotype, phenotype, gene pool, phenotypic plasticity, mutation, sexual reproduction, asexual reproduction, evolution, morphological species, biological species, hybrid, gene frequency, isolating mechanism, allopatric species, sympatric species, polyploidy

Chapter 3. Weather, climate, carbon dioxide, greenhouse effect, summer solstice, atmospheric pressure, Coriolis effect, relative humidity, dew point, intertropical convergence zone (ITCZ), rain shadow, El Niño, La Nina

Chapter 4. Infiltration, Transpiration, evaporation, evapotranspiration, hydrogen bonds, specific heat, surface tension, viscosity, thermocline, epilimnion, diffusion, Alkaline, upwelling, tides, estuary,

Chapter 5. Desiccation, photosynthetically active radiation (PAR), sunflecks, rock, weathering, parent material, clay, soil texture, soil profile, horizons, O, A, B, C, E horizon, saturated soil, wilting point, available water capacity, cation exchange capacity, Colloids, pH, Calcification, Laterization

Sample essay questions:

- 1) Describe a field experiment that you might perform to test the hypothesis that plant productivity is driven by soil nitrogen content. Suggest one set of possible results and the implications of those results for the hypothesis.
- 2) Give an example of an adaptation, and describe in detail the process of natural selection that may have led to the evolution of the adaptation.
- 3) Describe the differences between stabilizing, disruptive, and directional selection.
- 4) List the five conditions for a lack of evolution, according to the Hardy-Weinberg principle.
- 5) Name two different species concepts. Describe, compare, and contrast them.
- 6) Describe in detail a real or hypothetical example of either sympatric or allopatric speciation.

- 7) Explain the concept of a trade-off, and suggest how it relates to the diversity of species we see among different habitats.
- 8) Explain why the world's major deserts have formed at specific latitudes.
- 9) Why do the amount of rainfall and the composition of vegetation differ greatly on opposite sides of a mountain range?
- 10) Explain how tides work. Why are they not always the same size? Why do they vary from place to place?
- 11) Define an estuary, and describe how gradients in salinity are maintained.
- 12) How do mechanical and chemical weathering lead to the formation of soils?
- 13) List and briefly describe the five most important soil-forming factors.
- 14) Draw a diagram of a typical soil profile consisting of four horizons, and name and briefly describe each horizon.
- 15) Why is cation exchange capacity important for soil fertility?