Comprehension Questions - Module 17: Populations & Speciation

Population Ecology

1. Explain how population size, density, and distribution are measured and why they matter.
2. Compare and contrast exponential and logistic population growth models.
3. Explain how carrying capacity limits population growth and what factors determine it.
4. Describe how density-dependent and density-independent factors affect population growth.

Population Dynamics

1. Explain how age structure affects population growth and future trends.
2. Compare and contrast Type I, Type II, and Type III survivorship curves.
3. Describe how life history traits (fecundity, age at first reproduction, lifespan) affect population dynamics.

Speciation Mechanisms

1. Compare and contrast allopatric, sympatric, and parapatric speciation.
2. Explain how geographic isolation can lead to speciation.
3. Describe how polyploidy can lead to sympatric speciation in plants.

Reproductive Isolation

1. Compare and contrast prezygotic and postzygotic reproductive barriers.

2. Explain how different types of reproductive isolation can prevent gene flow between populations.

3. Describe how reproductive isolation can evolve and lead to speciation.

Species Concepts

1. Compare and contrast the biological species concept, morphological species concept, and phylogenetic species concept.

2. Explain the challenges in defining species and why different concepts are useful in different contexts.

Macroevolution

1. Explain how microevolution (changes within populations) relates to macroevolution (patterns above the species level).

2. Describe how mass extinctions have shaped the history of life on Earth.

3. Explain how understanding speciation helps us understand biodiversity.