

# **Module 16: Evolution of Populations (Microevolution)**

## **Comprehension & Critical Thinking Questions**

### **Part 1: Core Concepts**

#### **1. Defining Evolution**

- If a population's allele frequencies change from 50% A / 50% a to 90% A / 10% a, has evolution occurred?

#### **2. Hardy-Weinberg Equilibrium**

- What does the Hardy-Weinberg principle describe?
- List the five conditions required for equilibrium. Are these conditions common in nature?

#### **3. Genetic Drift**

- Define genetic drift. Does it affect large or small populations more strongly?
- Distinguish the Bottleneck Effect from the Founder Effect.

### **Part 2: Application**

#### **1. Types of Selection**

- Sketch graphs representing:
  - Directional selection
  - Stabilizing selection
  - Disruptive selection
- Provide a real-world example of each.

#### **2. Heterozygote Advantage**

- Sickle cell disease is recessive and often lethal. Why is the allele common in malaria-endemic regions?

- How does this demonstrate that fitness is environment-dependent?

## **Part 3: Analysis & Evaluation**

### **1. Sexual Selection**

- Peacocks have elaborate tails that increase predation risk. How can natural selection permit this trait?

### **2. Gene Flow**

- Two deer populations are separated by a mountain. A tunnel allows interbreeding.
- Will the populations become more similar or more different? What is the effect on speciation potential?