CHAPTER 13 Answers to Problems

Problem 13.1. In the most general terms, inbreeding refers to mating between individuals that are more related to each other than two individuals chosen at random from a population. However, there are several different phenomena that are described by the term inbreeding. (See the first paragraph of this chapter.)

Problem 13.2. An individual is considered inbred if he or she has an ancestor that can be traced through both his or her paternal and maternal lineage (a so-called common ancestor). If we trace our lineage back far enough (perhaps thousands or millions of years), our father and mother will share a common ancestor.

Problem 13.4. If a mutation occurs in one of the two copies of the allele since it was present in a common ancestor.

Problem 13.5.

$F_A = 0.016$ (2 loops with $N=7$)

$F_B = 0.078$ (2 loops with $N=5$ and two loops with $N=7$)

$F_C = 0.016$ (2 loops with $N=7$)

Problem 13.7. Using expression 13.5, $B = 2.19$. Therefore, there are 4.38 LEs per diploid individual in these two populations.

Problem 13.12.

56916 $F = 0.25$
56902 $F = 0.125$
56918 $F = 0.25$
69631 $F = 0.1875$
73543 $F = 0.28125$

Problem 13.13.

F (Favourite) = 0.1918

Common Ancestor	F_{CA}	N	$(1/2)^N (1-F_{CA})$
Foljambe 263	0	3	0.1250
Favorite (cow)	0	4	0.0025
Studley Bull 626	0	12	0.0002
Studley Bull 626	0	12	0.0002
Smith's Bull	0	8	0.0039
			0.1918