

1. 名詞解釋 (30points):

a. Fitness

b. Genetic Drift

c. Inbreeding coefficient

2. Jeffrey Mitton and his colleagues found three genotypes (R^2R^2 , R^2R^3 , and R^3R^3) at a locus encoding the enzyme peroxidase in ponderosa pine trees growing at Glacier Lake, Colorado. The observed numbers of these genotypes were: 135 R^2R^2 ; 44 R^2R^3 ; 11 R^3R^3 . Are the ponderosa pine trees at Glacier Lake in Hardy-Weinberg equilibrium at the peroxidase locus? Please use Chi-square goodness-of-fit test to verify your answer. (50 points)

Critical values of the χ^2 distribution				
<i>df</i>	1	2	3	4
$\alpha=0.05$	3.841	5.991	7.815	9.488

3. Please explain or illustrate what is difference between “alleles identical by descent” and “alleles identical by state”. (20 points)