

1. Please explain the following genetic terms:

a. Dominance (12 points)

b. Incomplete dominance (12 points)

c. Codominance (12 points)

d. Penetrance (12 points)

e. Expressivity (12 points)

2. Two pure lines of cockroaches (蟑螂) differing in two characteristics, body color and wing shape, were crossed: [brown body, straight wing] x [yellow body, curved wing]. Phenotype for all of F1 progenies was brown body and straight wing. The F1 progenies were backcrossed to the parent with yellow body and curved wing. The BC1 progenies were classified into 4 different phenotypes as below:

63	brown body, straight wings
28	brown body, curved wings
33	yellow body, straight wings
77	yellow body, curved wings

It is known that distinct phenotypes of both characteristics were associated with a pair of alleles. Please use clear symbol to write genotypes and their associated phenotypes (including parental lines, F1, and four types of BC1 progenies) and then use chi-square test of independence to verify whether alleles of these two loci were independently assorted. (Write answers on the back side.) (40 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