

1. Please briefly answer questions below:

- (1) How do complete dominance, incomplete dominance, and co-dominance differ? (20 points)
- (2) What is the difference between heterozygous and hemizygous ? (20 points)
- (3) How do you determine a particular trait is cytoplasmic maternal inheritance or nuclear maternal effect? And how can you distinguish these two mechanisms by a designed genetic experiment? (20 points)

2. In *Antirrhinum* plants, two true-breeding, white-flowered lines are intercrossed, and all F1 progenies are white flowered plants. By self-pollinating an F1 progeny, 131 F2 progenies are white-flowered plants, while 29 F2 progenies are red-flowered plants.

- a. Deduce the genotypes of these phenotypes (including two parental lines, F1 and F2 progenies), using clearly defined gene symbols. Also, please use Chi-square test to validate your hypothesis. (30 points)
- b. Predict possible outcomes of progenies derived from the self-pollinated red-flowered plants. (10 points)

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

