

國立中央大學九十學年度轉學生入學試題

生命科學系

三年級

科目：

遺傳學

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一、問答題：(20 points/each question)

1. What is Hardy-Weinberg equation (哈溫定律)? For Hardy-Weinberg equation to be true, what assumptions need to meet?
2. Please explain the postulates (假說或推論) that Mendel has proposed from his genetic experiments with garden pea.
3. Compare the difference between Meiosis and Mitosis.
4. In a species of plant, two genes control flower color. The red allele (R) is dominant to the white allele (r); The color-producing allele (C) is dominant to the non-color-producing allele (c). You suspect that either an rr homozygote or a cc homozygote will produce white flowers. In other words, rr is epistatic to C , and cc is epistatic to R . To test your hypothesis, you allow heterozygous plants ($RrCc$) to self-fertilize and count the offspring. You obtain the following results: 201 plants with red flowers and 144 with white flowers. Conduct a chi-square analysis to see if your observed data are consistent with your hypothesis.

Df	Probability (p)					
	0.90	0.50	0.20	0.05	0.01	0.001
1	0.02	0.46	1.64	3.84	6.64	10.83
2	0.21	1.39	3.22	5.99	9.21	13.82
3	0.58	2.37	4.64	7.82	11.35	16.27

Chi-square value (X^2)

二、解釋下列名詞：(4 points/each question)

Testcross

Karyotype

Hemizygous

Polytene chromosome

Epigenetic inheritance

參考