

I. 配合題(自右方名詞中，選入適當的填入)(一題 2 分，共 20 分)

1. Evolution of similar features independently in different evolutionary lineages, usually from different antecedent features
2. Mating with another genetic individual
3. The association of two alleles at two or more loci at the frequency predicted by their individual frequencies
4. A lineage of individuals reproduced asexually, by mitotic division
5. Separation of a continuously distributed ancestral population or species into separate populations because of the development of a geographic or ecological barrier
6. Reduction or elimination of DNA sequence variation in the vicinity of a mutation that has been fixed by natural selection relatively recently
7. The difference between the mean relative fitness of individuals of a given genotype and that of a reference genotyp
8. The evolution of internal factors during development that reduce the effect of perturbing environmental and genetic influences
9. Conferral of a benefit on other individuals at an apparent cost to the donor
10. Maintenance of a homogeneous nucleotide sequence among the members of a gene family, which evolves over time

- |                          |
|--------------------------|
| A. linkage equilibrium   |
| B. concerted evolution   |
| C. canalization          |
| D. vicariance            |
| E. clone                 |
| F. outcrossing           |
| G. selective sweep       |
| H. altruism              |
| I. convergence           |
| J. selection coefficient |

II. 名詞解釋(每題 4 分，共 40 分)

1. Heritability
2. Phenotypic plasticity
3. Bottleneck effect in population genetics
4. Sympatric speciation
5. Adaptive radiation
6. Game theory
7. Evolutionary stable strategy (ESS)
8. Neo-Darwinism
9. Cultural Evolution
10. Coevolution

III. 問答題(共 40 分)

1. In the past decades, there are many taxa of plants and animals that were recognized as paraphyletic groups, rather than a monophyletic one. Give an example for such case and explain why it is so. (10 points)

見背面

2. In order to calculate the selection coefficient ( $s$ ) and mean fitness ( $W_m$ ), we need to know the absolute fitness ( $R_i$ ) and relative fitness ( $W_i$ ) for the genotype  $i$ , where  $s = 1.0 - W_i$ , when the reference genotype has a relative fitness of 1.0. Now there are genotypes A and B in a population, and have frequencies of 0.4 and 0.6, respectively. If  $R_A = 20$  and  $R_B = 40$ , what are  $W_A$ ,  $W_B$ , and  $W_m$ ? (10 points)

3. What are the difference among “Natural Selection, Sexual Selection and Neutral Selection”? Any conflict between some of them? (10 points)

4. What are the definition and difference among “Gene Selection, Individual Selection, and Group Selection”? Any conflict between some of them? (10 points)

試題隨卷繳回