

※ 注意：選擇題請於試卷之「選擇題作答區」依序作答。

一、選擇題(每題3分，共15分)

1. 下列何者不是哈溫定律(Hardy-Weinberg model)的前提？
  - a) large population size
  - b) no gene flow
  - c) stochastic events
  - d) no mutation
  - e) random mating
2. 下列何種突變屬於異類取代(transversional mutation)?
  - a) A to C
  - b) A to G
  - c) T to C
  - d) Valine to Purine
  - e) gene order ABCDE to ADCBE
3. 下列有關密碼子使用(codon usage)的描述，何者為非？
  - a) different among species
  - b) can be influenced by GC content of the genome
  - c) synonymous substitution is equal to nonsynonymous substitution
  - d) can be influenced by transcriptional efficiency requirement of the gene
  - e) only observed in coding region
4. 下列有關寒武紀大爆發(Cambrian explosion)的敘述何者為非？
  - a) It is around 500-550 mya
  - b) Bilateral fossils are abundant in Ediacaran fauna
  - c) Various body sizes, segmented body plans are found in Burgess Shale
  - d) One of the possible causes is the rising oxygen concentrations in seawater
  - e) A mass extinction event eliminated much of the Ediacaran fauna at the end of the Proterozoic, creating many new niches
5. 下列名詞之解釋何者為非？
  - a) A paraphyletic group is a set of species containing an ancestral species and some, but not all, of the descendants
  - b) Parsimony principle in phylogenetics is to infer an evolutionary branching pattern that shows the smallest number of evolutionary changes
  - c) Heterozygote is an individual having two different alleles at a genetic locus
  - d) Macroevolution refers to grand evolutionary events above species level
  - e) Cope's rule infers an evolutionary decrease in body size over geologic time in a lineage of populations

二、名詞解釋(每題5分，共30分)

1. Kin selection
2. Evolutionary stable strategy
3. Character displacement
4. Dual inheritance theory
5. Neo-Darwinism
6. Secondary reinforcement (in evolutionary genetics context)

見背面

三、簡答題 (共55分)

1. 生命的形態繽紛多樣，生活史(Life history)的參數可以定調某種生物的一生過程模式，請列出常見的生活史的參數？其在演化研究上有哪些trade-off焦點，請舉兩例說明。(15%)
2. 動物合作&利他行為與達爾文的天擇理論 (Natural Selection) 有何矛盾之處，如何以近代的演化生物學觀點來詮釋？(10%)
3. 試提出一形成合子前之生殖隔離機制(pre-zygotic isolation)，並舉例說明之。(10%)
4. 比較Mullerian mimicry和Batesian mimicry，並各舉例說明之。(10%)
5. 試舉出五個影響演化速率的因子，並簡單說明之。(10%)

