壹、

※ 注意：請於試卷上依序作答，並應註明作答之大題及其題號。

1. 舉例說明造成 Pest population resurgence and replacement的原因及其管理對策 (Managing resurgence and replacement)。(20分)

2. 比較農業害蟲和醫學重要性害蟲的蟲害管理 (pest management) 的差異。(5分)

3. 舉例說明性費洛蒙 (sex pheromone) 在蟲害管理上應用的方式。(10分)

貳、

一、區別半翅目中異翅亞目 (Heteroptera)、頸喙亞目 (Auchenorrhyncha)、胸喙亞目 (Sternorrhyncha)之差異。(10%)

二、就你所知，說明昆蟲成為陸地上最優勢動物的原因為何？(5%)

三、Motoo Kimura 於 1968 年所提出分子演化的中性理論(Neutral theory of molecular evolution)主要的內容、依據及應用為何？試著比較它們與達爾文的演化論天擇理論的異同或關連。(10%)

四、解釋下列名詞：(10%)

1. parthenogenesis
2. Paleoptera
3. monophyletic group
4. homoplasy
5. Shannon index
6. functional response
7. r selection
8. trochantin
9. epimeron
10. tentorium

見背面

國立臺灣大學98學年度碩士班招生考試試題

參、

問答題： 每題10分

1. 抗藥性是一個嚴重之問題，不論在醫學上抗生素之使用、或農業上農藥過度使用，均可能導致嚴重之抗藥性，請敘述在農業上造成殺蟲劑抗藥性發生的可能機制？

2. 請闡述害蟲生物防治之種類、應用之方式及其優、缺點或可能之潛在風險?

3. 請翻譯下面一篇文章摘要(選自Current Biology 19(2009) 78-81)，

文章篇名：**Cuticular Hydrocarbons Reliably Identify Cheaters and Allow Enforcement of Altruism in a Social Insect**

摘要--Cheaters are a threat to every society and therefore societies have established rules to punish these individuals in order to stabilize their social system. Recent models and observations suggest that enforcement of reproductive altruism (policing) in hymenopteran insect societies is a major force in maintaining high levels of cooperation. In order to be able to enforce altruism, reproductive cheaters need to be reliably identified. Strong correlational evidence indicates that cuticular hydrocarbons are the means of identifying cheaters, but direct proof is still missing. In the ant Aphaenogaster cockerelli, we mimicked reproductive cheaters by applying a synthetic compound typical of fertile individuals on nonreproductive workers. This treatment induced nestmate aggression in colonies where a queen was present. As expected, it failed to do so in colonies without a queen where workers had begun to reproduce. This provides the first direct evidence that cuticular hydrocarbons are the informational basis of policing behaviors, serving a major function in the regulation of reproduction in social insects. We suggest that even though cheaters would gain from suppressing these profiles, they are prevented from doing so through the mechanisms of hydrocarbon biosynthesis and its relation to reproductive physiology. Cheaters are identified through information that is inherently reliable.

試題隨卷繳回