

1. 請描述昆蟲眼睛的組成中，桿狀體 (rhabdom)，桿小體 (rhabdomere)，與微絨毛 (microvilli) 之間的關係。(5 分)
2. 請問昆蟲的血球 (hemocytes) 有哪些作用。(5 分)
3. 請條列昆蟲真社會性 (Eusociality) 的 3 個特徵。(5 分)
4. 你認為下列哪 3 個部位會在昆蟲的蛻皮過程中一同被蛻去？並簡述你的理由。(7 分)
(A)前腸 foregut (B)中腸 midgut (C)後腸 hindgut
(D)背血管 dorsal vessel (E)氣管 trachea
5. 請回答下面四個例子中，哪幾個不是昆蟲利用費洛蒙 (pheromone) 溝通的例子，並簡述你的理由。(8 分)
(A)紅螢科 (Lycidae) 釋放氣味驅趕其他捕食性甲蟲
(B)小蠹蟲 (Scolytinae) 取食松樹後，松樹釋放氣味吸引同種小蠹蟲聚集
(C)小蠹蟲 (Scolytinae) 取食松樹後，松樹釋放氣味吸引不同種小蠹蟲聚集
(D)小蠹蟲 (Scolytinae) 取食松樹後，松樹釋放氣味吸引小蠹蟲的天敵寄生蟲蜂聚集
6. 昆蟲在捕食獵物時，有一些種類會以主動搜尋 (Active foraging)、非隨機性的方式尋找並獵捕獵物。請說明此類主動搜尋的昆蟲會利用哪三類線索搜尋 (12 分)，並各舉一個例子說明。(6 分)
7. 有些昆蟲的防禦機制為透過隱蔽自己 (Defence by hiding)，不被掠食者發現而降低被掠食者攻擊的機會，而隱蔽又有不同的類型，請舉三個不同類型的隱蔽機制。(12 分)
8. 請說明典藏標本在科學上的目的。(10 分)
9. How does the rise in atmospheric CO₂ levels, and the associated climate change, influence the population dynamics and behavior of agricultural insect pests, particularly in relation to host plant interactions? (6 分)
10. In the context of integrated pest management, what are the anticipated challenges and potential strategies for controlling agricultural insect pests under changing climate conditions, such as increasing temperatures and variable precipitation patterns? (6 分)
11. How does increased plant biodiversity in agricultural systems influence the diversity and population dynamics of insect pests and beneficial insects, and what are the implications for pest control and pollination services? (6 分)
12. Given the continued reliance on chemical control in most plant health programs, how can Integrated Pest Management (IPM) be effectively reoriented to prioritize ecological approaches, especially in managing insect pest populations in agroecosystems? (6 分)
13. Define 'entomophagy' and discuss its significance in the context of global food security and sustainable food production. (6 分)

試題隨卷繳回