

# 國立中央大學八十五學年度碩士班研究生入學試題卷

所別: 生命科學研究所 不分組 科目: 生物學

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注意: 可不抄題, 但要註明題號。

- 一. 試繪脊椎動物神經元(Neuron)基本構造簡圖, 並簡要說明神經衝動傳導之方式。(10%)
  
- 二. 現代分子生物學發展迅速, 試簡述分子生物學技術在分類、演化上之應用。(10%)
  
- 三. 繪一植物細胞構造模形圖、並註明各部位名稱。(10%)
  
- 四. 簡要敘述光合作用的機制。(10%)
  
- 五. 繪圖並簡要敘述(10%)
  - (1) IAA與植物向光性的相關性。
  - (2) GA與單子葉植物種子發芽的相關性。
  
- 六. 試說明下列現象(a)形成之原因、(b)對生態系統之影響。(c)有何防範或解決之道。(20%)

(1) Desertification	(2) Acid rain
(3) Eutrophication	(4) Greenhouse effect.
  
- 七. 解釋下列名詞:(20%)

(1) Cell-mediated immune system	(2) Organogenesis
(3) Herbivores	(4) Open circulatory system
(5) Malpighian tubules	(6) Alteration of generations
(7) Vascular bundle	(8) Ecosystem
(9) Nitrogen cycle	(10) Mitosis
  
- 八. 選擇題 (10%)——僅將答案寫於答案卷上即可, 然須註明題號。
  - (1) Most of our cells are surrounded by
    - a. blood
    - b. interstitial fluid
    - c. pure water
    - d. air
    - e. fluid equivalent to seawater in salt composition

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- (2) A decrease in the pH of human blood would
- a. decrease breathing rate
  - b. increase heart rate
  - c. decrease cardiac output
  - d. decrease CO<sub>2</sub> binding to hemoglobin
  - e. decrease the amount of O<sub>2</sub> unloaded from hemoglobin
- (3) Which of the following cells is *incorrectly* paired with its function?
- a. plasma cell--produces antibodies
  - b. helper T cell--lyses foreign cells
  - c. memory cells--rapidly proliferates into clones of effector cells when it encounters antigen
  - d. macrophages--engulfs bacteria and viruses
  - e. cytotoxic T cell--releases perforin that lyses infected cell
- (4) Antidiuretic hormone affects the kidney by
- a. stimulating the release of renin
  - b. constricting arterioles and thus raising blood pressure
  - c. increasing the reabsorption of Na<sup>+</sup> in the distal convoluted tubules
  - d. countering the renin-angiotensin-aldosterone mechanism
  - e. increasing the water permeability of the distal convoluted tubule and collecting duct, thus increasing the osmolarity of the urine.
- (5) Which of the following moleculars is *incorrectly* paired with its source?
- a. lysozyme--gastric juices
  - b. histamine--injured cells
  - c. interferons--virus-infected cells
  - d. immunoglobulins--plasma cells
  - e. interleukin I---macrophage