

科目名稱	普通生物學	類組代碼	A04/B04/C07/C08/D06
		科目碼	A0401

※本項考試依簡章規定所有考科均「不可」使用計算機。

本科試題共計 3 頁

選擇題(單選), 每題 2 分。請於答案卡上作答, 否則不予計分。

- Which parts of the amino acids AA1 and AA2 are involved in the formation of a peptide bond? AA1-AA2  
 (A) amino group of AA1 and carboxyl group of AA2  
 (B) carboxyl group of AA1 and amino group of AA2  
 (C) carboxyl group of AA1 and side chain of AA2  
 (D) side chains of both AA1 and AA2
- An inhibitor of which of the following enzymes could be used to block the release of calcium from the endoplasmic reticulum?  
 (A) tyrosine kinases  
 (B) phosphodiesterase  
 (C) phospholipase C  
 (D) adenylyl cyclase
- A nonfunctional CD4 protein on a helper T cell would result in the helper T cell being unable to \_\_\_\_\_.  
 (A) respond to circulating viral antigens  
 (B) lyse tumor cells  
 (C) stimulate a cytotoxic T cell  
 (D) interact with a class II MHC-antigen complex
- Which of the following enzymes essentially reverses the reaction catalyzed by adenylyl cyclase?  
 (A) protein kinase  
 (B) protein phosphatase  
 (C) phosphorylase  
 (D) phosphodiesterase
- A mutation that disrupts the ability of an animal cell to add polysaccharide modifications to proteins would most likely cause defects in which of the following structural elements?  
 (A) extracellular matrix  
 (B) intermediate filaments  
 (C) microfilaments  
 (D) microtubules
- What would you expect to happen if MPF is introduced into immature frog oocytes that are arrested in G2?  
 (A) The cells would remain arrested in G2.  
 (B) The cells would enter G0.  
 (C) The cells would enter mitosis.  
 (D) The cells would begin DNA synthesis.

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7. Clonal selection is an explanation for how \_\_\_\_\_.
- (A) V, J, and C gene segments are rearranged
  - (B) an antigen can provoke production of high amounts of specific antibodies
  - (C) HIV (human immunodeficiency virus) can disrupt the immune system
  - (D) macrophages can recognize specific T cells and B cells
8. A decrease in entropy is associated with which of the following types of reaction?
- (A) dehydration
  - (B) catabolic
  - (C) depolymerization
  - (D) hydrolysis
9. Which of the following types of metabolic poison would most directly interfere with glycolysis?
- (A) an agent that reacts with oxygen and depletes its concentration in the cell
  - (B) an agent that binds to pyruvate and inactivates it
  - (C) an agent that closely mimics the structure of glucose but is not metabolized
  - (D) an agent that reacts with NADH and oxidizes it to NAD<sup>+</sup>
10. Which of the following processes is most directly driven by light energy?
- (A) creation of a pH gradient by pumping protons across the thylakoid membrane
  - (B) carbon fixation in the stroma
  - (C) reduction of NADP<sup>+</sup> molecules
  - (D) oxidation of chlorophyll molecules

臺灣綜合大學系統 113 學年度學士班轉學生聯合招生考試試題

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申論問答題 請於答案卷上作答，否則不予計分。

1. Name 2 amino acids which can function as neurotransmitters. (4 points)
2. Explain the roles of cytochrome *c* in animal cell survival and apoptosis. (4 points)
3. Compare the actions of competitive inhibition, noncompetitive inhibition, and allosteric inhibition. (6 points)
4. Apical ectodermal ridge is important for limb pattern formation. Which molecule is released by the apical ectodermal ridge to promote limb bud outgrowth? The receptor for this molecule belongs to which family? (4 points)
5. Please define pinocytosis. Does this process require the formation of pseudopodium? (5 points)
6. What is fecal microbial transplantation? (3 points)
7. What is dynein? What is its general function? (4 points)
8. CRISPR and RNAi in personalized medicine. (20 points)
9. (1) Give one genetically modified plant and describe the modification. (6 points)  
(2) Give 3 methods that prevent transgene escape. (9 points)
10. Hardy-Weinberg equation and its application. (15 points)