



國立臺灣海洋大學一〇〇學年度研究所碩士班暨碩士在職專班入學考試試題

考試科目：普通生物學（一）

系所名稱：海洋生物研究所碩士班不分組

1.答案以橫式由左至右書寫。2.請依題號順序作答。

1. Multiple-Choice Questions (2 % for each):

- (1) Which system controls smooth and cardiac muscles of the digestive, cardiovascular, and excretory systems?
 - (A) central nervous system
 - (B) peripheral nervous system
 - (C) autonomic nervous system
 - (D) parasympathetic nervous system
 - (E) sympathetic nervous system

- (2) The operation of the sodium-potassium "pump" moves
 - (A) sodium and potassium ions into the cell.
 - (B) sodium and potassium ions out of the cell.
 - (C) sodium ions into the cell and potassium ions out of the cell.
 - (D) sodium ions out of the cell and potassium ions into the cell.
 - (E) sodium and potassium ions into the mitochondria.

- (3) Fertilization of human eggs usually takes place in the
 - (A) ovary.
 - (B) uterus.
 - (C) vagina.
 - (D) oviduct.
 - (E) cervix.

- (4) Contact of a sperm with signal molecules in the coat of an egg causes the sperm to undergo
 - (A) mitosis.
 - (B) depolarization.
 - (C) apoptosis.
 - (D) vitellogenesis.
 - (E) the acrosomal reaction.

2. Please give an example to explain the meaning of "countercurrent exchange". (4 %)
3. Please briefly state how to produce and release the anterior pituitary hormones? (4 %)
4. Please draw and label a picture showing the structure of the IgG. (4 %)

5. 陸域植物是由水域的綠藻登陸演化而出，請以綠藻、苔蘚類和裸子植物（如松柏）生活史的差異來探討其演化差異。(9%)
6. 請比較蕨類和開花植物在陸域生活的適應演化有何異同。(6%)
7. 有些陸域植物可高達數十米，其高大的莖是如何生長而成的呢?(5%)
8. 試區分病毒(virus)、類病毒(viroid)和傳染性蛋白質(prion)。(6%)
9. 試說明細菌的營養模式(mode of nutrition)。(8%)
10. 試簡述菌絲狀真菌的生命週期。(6%)
11. 問答題 (每題 4%)
 - (1) 請比較 prokaryotic cell 和 eukaryotic cell。
 - (2) 請說明 photosynthesis 是如何經由 light reaction 和 Calvin cycle 來完成整個反應。
12. 解釋名詞 (每題 3%)
 - (1) Paracrine signaling
 - (2) Chemiosmosis
 - (3) Cell cycle
 - (4) Fluid mosaic model
13. 問答題
 - (1) Acid precipitation. How it happens and what is its effect on environments? (5%)
 - (2) Radioactive tracers. How it is used in research? What is the function of scintillation fluid? (5%)
14. 解釋名詞
 - (1) kinetic energy (3%)
 - (2) hydrophilic and hydrophobic (4%)
 - (3) enantiomers (3%)