

國立屏東科技大學 108 學年度 碩士班暨碩士在職專班 招生考試
生物科技系(乙組) 生物學試題

單選題 每題 5 分，共 20 題、100 分

Multiple Choice Questions

1. () An experimental study is conducted to determine whether or not a new drug reduces high blood pressure. The change in systolic and diastolic blood pressure values of the participants represents the 實驗研究新藥是否可降低高血壓，參與者的收縮壓和舒張壓值的變化表示：
(1) independent variable, 自變量
(2) control group, 對照組
(3) hypothesis, 假設
(4) dependent variable, 因變量
2. () What is the correct order (from small to large)? 正確的順序是（從小到大）？
(1) molecules, organism, population, communities, biosphere, 分子，生物體，種群，群落，生物圈
(2) community, organ system, ecosystems, 群落，器官系統，生態系統
(3) cells, organelles, 細胞，胞器
(4) communities, cells, population, biosphere, ecosystems, 群落，細胞，種群，生物圈，生態系統
3. () What is the correct order of the exocytosis or secretion pathway? 胞吐作用或分泌途徑的正確順序是什麼？
(1) rough ER, Golgi, transport vesicle, plasma membrane, 粗糙內質網，高爾基體，運輸囊泡，質膜
(2) rough ER, Golgi, smooth ER, plasma membrane, 粗糙內質網，高爾基體，光滑內質網，質膜
(3) smooth ER, rough ER, exocytosis, Golgi, 光滑內質網，粗糙內質網，胞吐作用，高爾基體
(4) rough ER, endosome, Golgi, smooth ER, 粗糙內質網，內體，高爾基體，內質網
4. () An artificial liposome, whose membrane contains no proteins, is loaded with a 0.03 M sucrose solution and put into pure water. Which choice best describes what will quickly happen next? 將不含蛋白質的人工脂質膜體內加入 0.03M 蔗糖溶液並放入純水中。哪個選項最能說明接下來會發生的事？
(1) Since there are no membrane proteins, nothing will cross the membrane. 因為沒有膜蛋白，沒有任何物質會穿過膜
(2) Sucrose will diffuse out of the liposome. 蔗糖會從脂質體中擴散出來
(3) Water will diffuse down its concentration gradient into the liposome, causing it to burst. 水因其濃度梯度向內擴散到脂質體中，導致其破裂
(4) Water will enter the liposome, diluting the sucrose concentration there down to 0 M. 水將進入脂質體，將蔗糖濃度稀釋至 0 M

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5. () A steroid hormone is bound by an intracellular receptor. When it does, the resulting complex is most likely to do which of the following? 類固醇激素由細胞內受體結合。如果是這樣，由此產生的複合體最有可能發生以下哪種情況？
- (1) open channels in the membrane for other substances to enter 其他物質由膜的開放通道進入
 - (2) mediate the transfer of phosphate groups to/from ATP. 介導磷酸基團向/從 ATP 轉移
 - (3) act as a transcription factor in the nucleus. 可作為細胞核中的轉錄因子
 - (4) make water-soluble molecules able to diffuse across membranes 使水溶性分子能夠擴散穿過膜
6. () Cellular respiration can best be described as 細胞呼吸最好地描述為：
- (1) using energy released from breaking high-energy covalent bonds in organic molecules to force ATP formation from ADP and phosphate. 從破壞有機分子中的高能共價鍵釋放的能量來迫使 ADP 和磷酸形成 ATP
 - (2) Taking electrons from food and giving them to phosphate to make ATP. 從食物中取出電子並將其轉化為磷酸鹽以製造 ATP
 - (3) Taking electrons from food and giving them to oxygen to make water and using the energy released to drive ATP formation. 從食物中取出電子並將它們提供給氧氣以製造水並利用釋放的能量來驅動 ATP 的形成
 - (4) Converting higher-energy organic molecules to lower-energy organic molecules and using the energy released to drive ATP formation. 將高能有機分子轉化為低能有機分子，並利用釋放的能量驅動 ATP 形成
7. () When donating its activated electron, the chlorophyll in photosystem II (P680) is said to be a very powerful oxidizing agent. This is best shown by its ability to of the following events from the light reactions of photosynthesis, which would be expected to occur first? 當提供活化電子時，光系統 II (P680) 中的葉綠素被認為是一種非常強大的氧化劑。這透過對光合作用的光反應得到最好的證明，這些事件預計將 首先 發生的是？
- (1) donation of electrons from reduced Pq to the cytochrome complex. 從減少的 Pq 向細胞色素複合物捐贈電子
 - (2) While being split, electrons are taken out of water. 在水裂解時，電子被從水中取出
 - (3) Light-induced reduction of the primary electron acceptor in the reaction center of PS II takes place. 在 PS II 的反應中心發生光誘導的一次電子受體的還原
 - (4) acceptance of electrons by Pc from the cytochrome complex. Pc 從細胞色素複合物中接受電子
8. () Which of the following transmits genes from both parents to child, or from one generation of a family to another? 以下哪一項將基因 從父母 傳給孩子，或從一代傳播到另一代？
- (1) DNA (2) gametes, 配子 (3) somatic cells, 體細胞 (4) mitosis, 有絲分裂

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9. () A cross between homozygous purple-flowered and homozygous white-flowered pea plants results in offspring with purple flowers. This demonstrates. 純型合子的紫色花和純型合子的白花豌豆植物之間的雜交導致後代具有紫色花。證明了：
- (1) true breeding, 真正的育種繁殖 (2) dominance, 完全顯性
(3) a dihybrid cross, 雙雜交 (4) the mistakes made by Mendel, 孟德爾犯的錯誤
10. () What enzyme does a gamete-producing cell include that compensates for replication-associated shortening? 產生配子的細胞含有什麼酶可以補償複製相關的縮短
- (1) telomerase, 端粒酶 (2) ligase, 連接酶
(3) DNA polymerase II, DNA 聚合酶 II (4) proofreading enzyme, 校正酶
11. () Which of the following broad taxonomic groups is not one of the three domains of life? 以下哪些廣泛的分類群體不是生命的三個領域之一？
- (1) Bacteria, 細菌 (2) Archaea, 古生菌
(3) Eukarya, 真核生物 (4) Plantae, 植物
12. () Sugars formed in the leaves through photosynthesis get to the roots through the 光合作用在葉片中形成的糖通過以下物質進入根部：
- (1) phloem, 韌皮部 (2) epidermis, 表皮
(3) pith, 髓 (4) cortex, 內皮
13. () Which of these is most directly involved in causing the leaves of deciduous trees to fall in autumn? 哪一個最直接導致秋季落葉樹葉落下？
- (1) cytokinins, 細胞分裂素 (2) ethylene, 乙烯
(3) gibberellins, 赤黴素 (4) brassinosteroids, 油菜素類固醇(油菜素內脂)
14. () What type of signaling is involved if the target receptor is located on the same cell that produced the hormone? 如果靶受體位於產生激素的同一細胞上，涉及什麼類型的信號傳導？
- (1) paracrine, 旁分泌 (2) exocrine, 外分泌
(3) neuroendocrine, 神經內分泌 (4) autocrine, 自分泌
15. () In humans, the first opportunity for ingested food to undergo enzymatic hydrolysis is in the 人類中攝取食物進行酶水解的第一個機會是在
- (1) large intestine, 大腸 (2) mouth, 嘴巴
(3) liver, 肝 (4) stomach, 胃

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16. () Which of the following have valves within them to prevent blood backflow? 哪一項中設有閥門以防止血液回流？
- (1) arteries, 動脈 (2) veins, 靜脈
(3) capillaries, 毛細血管 (4) arterioles, 小動脈
17. () During human embryonic/fetal development, which part of the CNS undergoes the largest increase in mass? 類胚胎/胎兒發育過程中，中樞神經系統的哪一部分質量增加最多？
- (1) spinal cord, 脊髓 (2) midbrain, 中腦
(3) hindbrain, 後腦 (4) forebrain, 前腦
18. () Which of the following is not an abiotic factor organisms could come into contact with? 以下哪項不是生物可能接觸的 非生物因素 ？
- (1) salinity, 鹽度 (2) sunlight, 日光
(3) bacteria, 細菌 (4) temperature, 溫度
19. () Many distasteful insects are brightly colored. What type of behavior might help explain this? 昆蟲許多令人討厭的鮮豔顏色，什麼類型的行為有助於解釋這一點？
- (1) associative learning, 聯想學習 (2) fixed action pattern, 固定行動模式
(3) kinesis, 運動 (4) spatial learning, 空間學習
20. () Which of the following in vertebrates has the same function as hemocytes in insects? 脊椎動物中的哪一種與昆蟲中的血細胞具有相同的功能？
- (1) Toll-like receptor, Toll 樣受體 (2) interferon, 干擾素
(3) complement system, 補體系統 (4) neutrophils, 中性粒細胞