

國立彰化師範大學九十六學年度碩士班招生考試試題

系所：生物學系

組別：甲組

科目：生態學

★★請在答案紙上作答★★

共4頁 第1頁

一、選擇題（每題2分，共50分）

1. Large bodies of water maintain a constant temperature because of
 - A. water's high specific heat.
 - B. water's high viscosity.
 - C. water's high surface tension.
 - D. water's covalent nature.
2. If you begin with a single bacterium that divides every half hour, how many bacteria will there be at the end of four hours if there is a logistic population growth and carrying capacity is 256?
 - A. 128
 - B. 256
 - C. 512
 - D. 5280
3. Which of the following is **NOT** an attribute shared by all populations?
 - A. Age structure
 - B. Biomass
 - C. Density
 - D. Distribution
4. Which of the following environments would have the least temperature variation?
 - A. open ocean
 - B. small stream
 - C. terrestrial habitat
 - D. all would experience similar temperature variations
5. Endotherms have an advantage over ectotherms in
 - A. tropical climates.
 - B. cold environments.
 - C. rainy environments.
 - D. hot environments.
6. Which of the following statements is **INCORRECT**?
 - A. Experimentation involves manipulation to test a hypothesis.
 - B. Evolutionary biology allows scientists to study the effects of environmental variables on natural selection.
 - C. In order to understand the dynamics of the natural world we must depend on research from both population ecology and ecosystem ecology.
 - D. Most ecological experiments are conducted in the field.
7. 下列何種型式是屬於 Opportunistic 的生活史?
 - A. low l_x – low m_x – early age at reproductive maturity
 - B. low l_x – high m_x – late age at reproductive maturity
 - C. high l_x – high m_x – early age at reproductive maturity
 - D. high l_x – low m_x – late age at reproductive maturity

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共 4 頁 第 2 頁

8. 下列對 k selection 的描述，何者是不正確？
- A. 競爭能力強
 - B. 生產力低
 - C. 具親代撫育行為
 - D. 體型小
9. 有關 logistic population growth 的敘述，何者正確？
- A. 族群成長模式屬 J 形曲線
 - B. 族群大小接近 carrying capacity 時，成長速率加快
 - C. 族群個體數多時，per capita rate of increase(r)小
 - D. logistic equation 是由 geometric population growth 的公式修飾而來
10. 下列敘述何者正確？
- A. 氣候可以直接影響物種的地理分布
 - B. 生物體藉著調控身體溫度及水含量完全無法補償環境的變化
 - C. 自然環境會限制物種的分布情形
 - D. 氣候不會影響寄生生物病原體的分布情形
11. 下列有關形成“microclimate”的因素中，請選出最正確者。
- (A) 海拔高度 (B) 雨量 (C) 植物相 (D) 濕度 (E) 土表顏色 (F) 地穴
- A. ABCF
 - B. ACDE
 - C. ACEF
 - D. BCDE
12. If community #1 has a higher Shannon-Wiener index than community #2, what does this mean?
- A. community #2 has a greater species diversity than community #1
 - B. community #1 has a greater species diversity than community #2
 - C. community #2 has a greater species numbers
 - D. community #1 has a lower species number
13. Which of the following would be considered a disturbance?
- A. hurricane
 - B. disease
 - C. salinity variations in an estuary
 - D. seasonal temperature variations in the temperate zone
14. Corals induce release of organic compounds with “signal compounds” that alter permeability of zooxanthallae_____.
- A. DNA
 - B. fat body
 - C. protein
 - D. cell membrane
15. 下列為有關於 Strong interaction 的敘述，何者正確？
- A. Feeding activities of a few species that have a dominant influence on community structure.
 - B. Feeding activities of a few species that have a weak influence on community structure.
 - C. Breeding activities of a few species that have a weak influence on community structure.
 - D. Breeding activities of a few species that have a dominant influence on community structure.

16. 關於營養瀑布(trophic cascades)假說，下列敘述何者錯誤？
- A.非常類似關鍵種假說
 - B.說明食物網頂端的消費者造成的效應會往底部傳遞
 - C.可說明消費者如何對初級生產量產生影響
 - D.營養瀑布主要在闡述生態系中食性的關係
17. 下列有關“Biomass accumulation model”的敘述，何者是錯的？
- A.干擾後，biomass 會急劇下降
 - B.在過渡期，biomass 會下降
 - C.在穩定期，biomass 是最高的
 - D.可分為重組期、過渡期和穩定期三時期
18. 下列有關 island biogeography 理論的敘述，何者是對的？
- A.離大陸相等距離的大小島，其 extinction rate 相同
 - B.二個面積相同的島，較近大陸的，其 extinction rate 較高
 - C.二個面積相同的島，離大陸較遠的島，其 immigration rate 較大
 - D.離大陸近的大島，其物種歧異最大
19. The competitive exclusion principle states
- A.two populations can coexist as long as they occupy separate niches.
 - B.two populations that are competitors cannot coexist.
 - C.two populations that compete will genetically change over a period of time.
 - D.two populations that compete will increase their carrying capacity.
20. The fundamental niche
- A.is the organism's ecotone.
 - B.is the range of environmental conditions an organism actually utilizes.
 - C.is the range of environmental conditions in which an organism can survive.
 - D.cannot be effected by symbiotic relationships.
21. If you began with 1000 calories stored in a few blades of grass, how many calories would you expect to be passed on to the primary consumer?
- A.1
 - B.10
 - C.100
 - D.1000
22. Intermediate disturbance hypothesis 說明生物歧異度最高，下列敘述何者與這假說有關？
- A.predation and parasitism
 - B.competition and colonization
 - C.functional response and numerical response
 - D.top_bottom control and key stone species
23. 南非的 Fynbos 被 *Acacia saligina* 入侵，也改變了 Fynbos 的營養循環方式，下列何者不包含在內？
- A.提高磷含量
 - B.提高氮含量
 - C.提高分解率
 - D.提高枯枝落葉產量

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共 4 頁 第 4 頁

24. When the predator population evolves in response to prey and the prey population evolves in response to the predator. What is said to have occurred?
- A.co_evolution
 - B.directional selection
 - C.predator_prey oscillation
 - D.Hardy_Weinberg evolution

25. A survivorship curve of type III functional response
- A.is linear
 - B.never reaches an asymptote
 - C.may result from predator satiation
 - D.results from a decrease in handling time

二、簡答題：共 50 分，答題請寫在答案卷。

1. 請解釋哈溫平衡定律 (Hardy-Weinberg Equilibrium Law) (10 分)，在生態學上如何運用哈溫平衡定律來解釋一個族群的狀況(10 分)。
2. 請說明族群成長(population growth)? 請分別畫出和簡述(1)培養在一個培養皿中的細菌族群成長曲線，和(2)目前人類的族群成長曲線，並說明其各屬於哪一類型的族群成長曲線，曲線的橫軸和縱軸都須寫上說明和單位。(15 分)
3. 請分別簡述下列三個生態學的專有名詞(每個 5 分，共 15 分)。
 - A. Abundance :
 - B. Species richness :
 - C. Biodiversity :