

本試題是否可以使用計算機： 可使用， 不可使用（請命題老師勾選）

考試日期：0302，節次：2

~~Department of Life Sciences 2008 Graduate School Test — Ecology~~

I. Multiple-choice questions. Circle all correct matches in the following multiple choice questions. Please note that any number of answers may be correct, including none and all of them. (total 25%)

(1) Acid rain is:

- a. caused by gases such as NO_2 and SO_3 in rainwater
- b. any precipitation with a pH less than 7.0
- c. is harmful where buffering materials are present
- d. is most harmful where cations such as aluminum and lead are common

(2) Evolution of longevity is promoted by increases in:

- a. parental care;
- b. body mass
- c. iteroparity;
- d. number of offspring per reproductive attempt

(3) In extremely dense populations (i.e., those exceeding carrying capacity):

- a. emigration must occur;
- b. decreases in reproduction must eventually occur
- c. increased death rates must eventually occur;
- d. none of these must occur

(4) Rapidly changing habitats generally are favorable to:

- a. K-selected species;
- b. species which reproduce numerous times in their lives
- b. small organisms;
- d. organisms which practice exploitative competition

(5) A population growing exponentially:

- a. has a constant r value;
- b. increases at a predictable rate
- c. increases at a constant N/t ;
- d. increases at a rate dependent upon N

(6) Which of the following is/are characteristic of long-lived species?

- a. lack of disease;
- b. parental care;
- c. large body size;
- d. semelparity

(7) Coexistence of closely related species having similar niches:

- a. is promoted by niche displacement

(背面仍有題目,請繼續作答)

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- b. is more likely when there is significant intra-specific variation in one or more of the species
- c. can't happen because of Gause's Rule
- d. can result in character displacement

(8) Species diversity increases:

- a. with time in a stable environment;
- b. with increased stratification of a community
- c. with succession of an ecological community;
- d. with amount of energy in an ecosystem

(9) Areas with low primary production include:

- a. estuaries;
- b. tundra;
- c. desert;
- d. coral reefs

(10) Primary productivity in grassland is 2000 Kcal/m² per year. How much energy reaches the C4 trophic level in this grassland?

- a. 2-16 Kcal/m²;
- b. 20-80 Kcal/m²;
- c. 0.2-3.2 Kcal/m²;
- d. < 0.2 Kcal/ m²

II. Short answer questions (total 25%)

- (1). What do survivorship curves tell us about a species' life history characteristics? What do the 3 different classes of curves mean for plant species? (5%)
- (2). Under what kind of environmental conditions would you expect to find "r-selected" versus "K-selected" species? (5%)
- (3). What are the costs and benefits of sexual and clonal reproduction? (5%)
- (4). Define "disturbance" in an ecological context. Give three examples of types of common disturbances. (5%)

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(5). Define "succession" in an ecological context. What is the difference between primary and secondary succession? (5%)

III. Definition and short answer questions (total 25%)

- (1) Define **directional selection** with examples, and discuss its effects on population (8%)
- (2) Define **sexual selection** with examples, and discuss its effects (8%)
- (3) Define the following terms: (3% each)
 - A. balanced polymorphism
 - B. keystone species
 - C. invasiveness

IV. Short answer questions (total 25%)

- (1) What is character displacement and what is limiting similarity? (6%)
- (2) Distinguish two types of life tables (6%)
- (3) Distinguish Bottom-up and top-down effects in ecology (6%)
- (4) At which three aspects resource partitioning has most often been observed? (7%)