



AP[®] Biology
2007 Free-Response Questions
Form B

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2007 AP[®] BIOLOGY FREE-RESPONSE QUESTIONS (Form B)

BIOLOGY
SECTION II

Time—1 hour and 30 minutes

Directions: Answer all questions.

Answers must be in essay form. Outline form is not acceptable. Labeled diagrams may be used to supplement discussion, but in no case will a diagram alone suffice. It is important that you read each question completely before you begin to write. Write all your answers on the pages following the questions in the goldenrod booklet.

1. Without adaptive behaviors, animals would not survive.
 - (a) **Describe** what innate and learned behaviors are. **Explain** the adaptive value of each of these two categories of behavior to an individual animal.
 - (b) During mating season, male snakes exhibit tracking behavior when they follow chemical pheromone trails deposited on the ground by females. **Design** a controlled experiment to determine whether a male garter snake will track only a female of his species or will also follow the female of a related species.
2. The defenses of the human body to the entry and establishment of a pathogen (disease-causing organism) can be divided into nonspecific responses and specific responses.
 - (a) **Explain** how THREE types of nonspecific defenses can prevent the entry and/or establishment of a pathogen in a person's body.
 - (b) **Discuss** how the immune system responds to an initial pathogenic exposure, and how this initial exposure can lead to a quicker response following a second exposure to the same pathogen.
 - (c) **Explain** the biological mechanisms that lead to the rejection of transplanted organs.

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3. A molecule of messenger RNA (mRNA) has just been synthesized in the nucleus of a human cell.
- (a) What types of modifications may occur to this RNA before it leaves the nucleus?
 - (b) Once in the cytoplasm, how is the mRNA translated to a protein?
 - (c) If the cell is a secretory cell, how is the protein from part (b) eventually targeted, packaged, and secreted to the exterior of the cell?
4. The energy flow in ecosystems is based on the primary productivity of autotrophs.
- (a) **Discuss** the energy flow through an ecosystem and the relative efficiency with which it occurs.
 - (b) **Discuss** the impact of the following on energy flow on a global scale.
 - Deforestation
 - Global climate change

STOP

END OF EXAM