



## AP<sup>®</sup> Biology 2003 Free-Response Questions Form B

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# 2003 AP<sup>®</sup> 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. A difference between prokaryotes and eukaryotes is seen in the organization of their genetic material.
  - (a) **Discuss** the organization of the genetic material in prokaryotes and eukaryotes.
  - (b) **Contrast** the following activities in prokaryotes and eukaryotes:
    - Replication of DNA
    - Transcription or translation
    - Gene regulation
    - Cell division
  
2. Hormones play important roles in regulating the lives of many living organisms.
  - (a) For TWO of the following physiological responses, **explain** how hormones cause the response in plants.
    - increase in height
    - adjustment to change in light
    - adjustment to lack of water
  
  - (b) For TWO of the following physiological responses, **explain** how hormones cause the response in animals.
    - increase in height
    - adjustment to change in light
    - adjustment to lack of water
  
  - (c) **Describe** TWO different mechanisms by which hormones cause their effects at the cellular level.

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3. Water is important for all living organisms. The functions of water are directly related to its physical properties.
- (a) **Describe** how the properties of water contribute to TWO of the following.
- transpiration
  - thermoregulation in endotherms
  - plasma membrane structure
- (b) Water serves as a reactant and a product in the carbon cycle. **Discuss** the role of water in the carbon cycle.
- (c) **Discuss** the impact of one human activity on the water cycle.
4. Biologists are interested in preserving the diversity of living organisms on the planet.
- (a) **Explain** THREE of the following processes or phenomena, using an appropriate example for each.
- mutation
  - adaptive radiation
  - polyploidy
  - population bottlenecks
  - growth of the human population
- (b) For each process or phenomenon you selected in (a), **discuss** its impact on the diversity of life on Earth.

**END OF EXAMINATION**