



AP[®] Biology 2006 Free-Response Questions

The College Board: Connecting Students to College Success

The College Board is a not-for-profit membership association whose mission is to connect students to college success and opportunity. Founded in 1900, the association is composed of more than 5,000 schools, colleges, universities, and other educational organizations. Each year, the College Board serves seven million students and their parents, 23,000 high schools, and 3,500 colleges through major programs and services in college admissions, guidance, assessment, financial aid, enrollment, and teaching and learning. Among its best-known programs are the SAT[®], the PSAT/NMSQT[®], and the Advanced Placement Program[®] (AP[®]). The College Board is committed to the principles of excellence and equity, and that commitment is embodied in all of its programs, services, activities, and concerns.

© 2006 The College Board. All rights reserved. College Board, AP Central, APCD, Advanced Placement Program, AP, AP Vertical Teams, Pre-AP, SAT, and the acorn logo are registered trademarks of the College Board. Admitted Class Evaluation Service, CollegeEd, connect to college success, MyRoad, SAT Professional Development, SAT Readiness Program, and Setting the Cornerstones are trademarks owned by the College Board. PSAT/NMSQT is a registered trademark of the College Board and National Merit Scholarship Corporation. All other products and services may be trademarks of their respective owners. Permission to use copyrighted College Board materials may be requested online at: www.collegeboard.com/inquiry/cbpermit.html.

Visit the College Board on the Web: www.collegeboard.com.

AP Central is the official online home for the AP Program: apcentral.collegeboard.com.

2006 AP[®] BIOLOGY FREE-RESPONSE QUESTIONS

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 pink booklet.

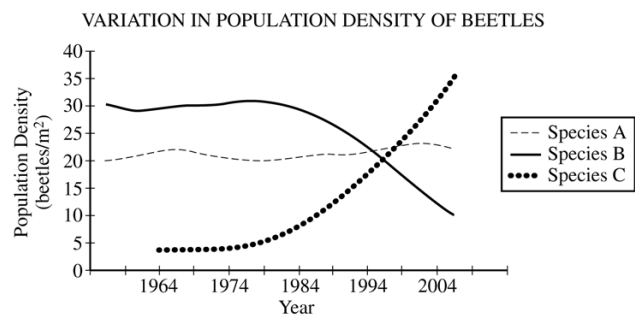
1. A major distinction between prokaryotes and eukaryotes is the presence of membrane-bound organelles in eukaryotes.
 - (a) **Describe** the structure and function of TWO eukaryotic membrane-bound organelles other than the nucleus.
 - (b) Prokaryotic and eukaryotic cells have some non-membrane-bound components in common. **Describe** the function of TWO of the following and **discuss** how each differs in prokaryotes and eukaryotes.
 - DNA
 - Cell wall
 - Ribosomes
 - (c) **Explain** the endosymbiotic theory of the origin of eukaryotic cells and **discuss** an example of evidence supporting this theory.

© 2006 The College Board. All rights reserved.

Visit apcentral.collegeboard.com (for AP professionals) and www.collegeboard.com/apstudents (for students and parents).

GO ON TO THE NEXT PAGE.

2006 AP® BIOLOGY FREE-RESPONSE QUESTIONS



2. According to fossil records and recent published observations, two species of leaf-eating beetles (species A and B) have existed on an isolated island in the Pacific Ocean for over 100,000 years. In 1964 a third species of leaf-eating beetle (species C) was accidentally introduced on the island. The population size of each species has been regularly monitored as shown in the graph above.

- Propose** an explanation for the pattern of population density observed in species C.
- Describe** the effect that the introduction of beetle species C has had on the population density of species A and species B. **Propose** an explanation for the patterns of population density observed in species A and in species B.
- Predict** the population density of species C in 2014. Provide a biological explanation for your prediction.
- Explain** why invasive species are often successful in colonizing new habitats.

3. The movement of water through vascular plants is important to their survival.

- Explain** the mechanism of water movement through vascular plants during transpiration. Include a discussion of how the anatomy of vascular plants and the properties of water contribute to this process.
- Explain** how gas exchange affects transpiration.
- Describe** TWO adaptations that affect the rate of transpiration in desert plants.

4. The evolution of circulatory systems allowed larger and more-complex animals to arise.

- Describe** the respiratory and digestive systems' specialized structures that facilitate the movement of oxygen and glucose into the circulatory system of mammals.
- Explain** how oxygen and glucose are transported within the circulatory system of mammals.
- Explain** the transfer of oxygen and glucose from the blood and into the active cells of mammals.

END OF EXAM

© 2006 The College Board. All rights reserved.

Visit apcentral.collegeboard.com (for AP professionals) and www.collegeboard.com/apstudents (for students and parents).