



AP[®] Biology 2002 Free-Response Questions Form B

The materials included in these files are intended for use by AP teachers for course and exam preparation in the classroom; permission for any other use must be sought from the Advanced Placement Program[®]. Teachers may reproduce them, in whole or in part, in limited quantities, for face-to-face teaching purposes but may not mass distribute the materials, electronically or otherwise. These materials and any copies made of them may not be resold, and the copyright notices must be retained as they appear here. This permission does not apply to any third-party copyrights contained herein.

These materials were produced by Educational Testing Service[®] (ETS[®]), which develops and administers the examinations of the Advanced Placement Program for the College Board. The College Board and Educational Testing Service (ETS) are dedicated to the principle of equal opportunity, and their programs, services, and employment policies are guided by that principle.

The College Board is a national nonprofit membership association dedicated to preparing, inspiring, and connecting students to college and opportunity. Founded in 1900, the association is composed of more than 4,200 schools, colleges, universities, and other educational organizations. Each year, the College Board serves over three million students and their parents, 22,000 high schools, and 3,500 colleges, through major programs and services in college admission, 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 equity and excellence, and that commitment is embodied in all of its programs, services, activities, and concerns.

Copyright © 2002 by College Entrance Examination Board. All rights reserved. College Board, Advanced Placement Program, AP, SAT, and the acorn logo are registered trademarks of the College Entrance Examination Board. APIEL is a trademark owned by the College Entrance Examination Board. PSAT/NMSQT is a registered trademark jointly owned by the College Entrance Examination Board and the National Merit Scholarship Corporation. Educational Testing Service and ETS are registered trademarks of Educational Testing Service.

2002 AP® BIOLOGY FREE-RESPONSE QUESTIONS (Form B)

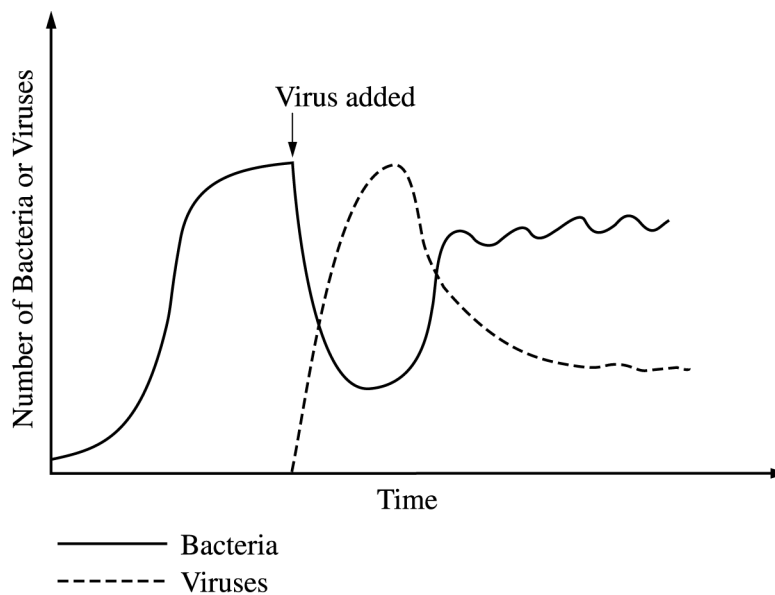
BIOLOGY SECTION II

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 this booklet.

1. Bacteria were cultured in a system that allowed for the continual addition of fresh nutrients and the removal of waste products. Bacteriophage (virus) were added at the time shown and the following population changes were observed.



- (a) **Describe** and explain the observed results.
- (b) **Discuss** the infection cycle of a DNA virus from attachment to lysis.
- (c) **Describe** how the genome of a retrovirus like HIV (Human Immunodeficiency Virus) becomes incorporated into the genome of the host cell.

2002 AP® BIOLOGY FREE-RESPONSE QUESTIONS (Form B)

2. In mammals, heart rate during periods of exercise is linked to the intensity of exercise.
- (a) **Discuss** the interactions of the respiratory, circulatory, and nervous systems during exercise.
 - (b) **Design** a controlled experiment to determine the relationship between intensity of exercise and heart rate.
 - (c) On the axes provided below, **indicate** results you expect for both the control and the experimental groups for the controlled experiment you described in part B. Remember to label the axes.



3. The physical form of cells and organisms is often influenced by special structural polymers. Choose **one** polymer from **each** of the following three pairs of polymers:

Pair 1: tubulin . . myosin

Pair 2: cellulose . . chitin

Pair 3: messenger RNA . . transfer RNA

For each of the three polymers you have chosen, **describe** its

- (a) structure, and
 - (b) role in a cell or organism.
4. A triploblastic animal is one in which three germ layers form during embryonic development. Triploblastic animals include acoelomate, pseudocoelomate, and coelomate (eucoelomate) organisms.
- (a) **Identify** the three germ layers of a triploblastic embryo and **discuss** the fates of these germ layers in embryonic development.
 - (b) **Describe** acoelomate, pseudocoelomate, and coelomate body plans. **Identify** an animal that is representative of **each** of these types of body plan.
 - (c) **Compare and contrast** the digestive systems of an acoelomate and a coelomate organism.

END OF EXAMINATION