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ABSTRACT

Advanced Placement serves the interests of three groups: (1) high school students capable of pursuing college-level studies, (2) secondary schools that desire to offer these students the opportunity of working at an advanced level, and (3) colleges that wish to encourage and recognize such achievement. Professional consensus on the form that these college-level studies can most usefully take is therefore basic to the program. This consensus, maintained and reviewed by the committees of examiners, is stated as the course description for each of the 11 fields of study presently included in the program: American history, biology, chemistry, English, European history, French, German, Latin, mathematics, physics, and Spanish. The examining committees of school and college teachers that prepare the course descriptions have allowed for differences in the patterns of study that may be developed by participating schools. Each description contains basic concepts in the course, the basic course approach, the level of quality, examination, and answers. (Author/KJ)

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*College
Entrance
Examination
Board*

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1968-70
ADVANCED
PLACEMENT
COURSE
DESCRIPTIONS

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U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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Separate leaflets for each subject are available at 50 cents per copy. These leaflets contain the course description and examination questions as published in this book.

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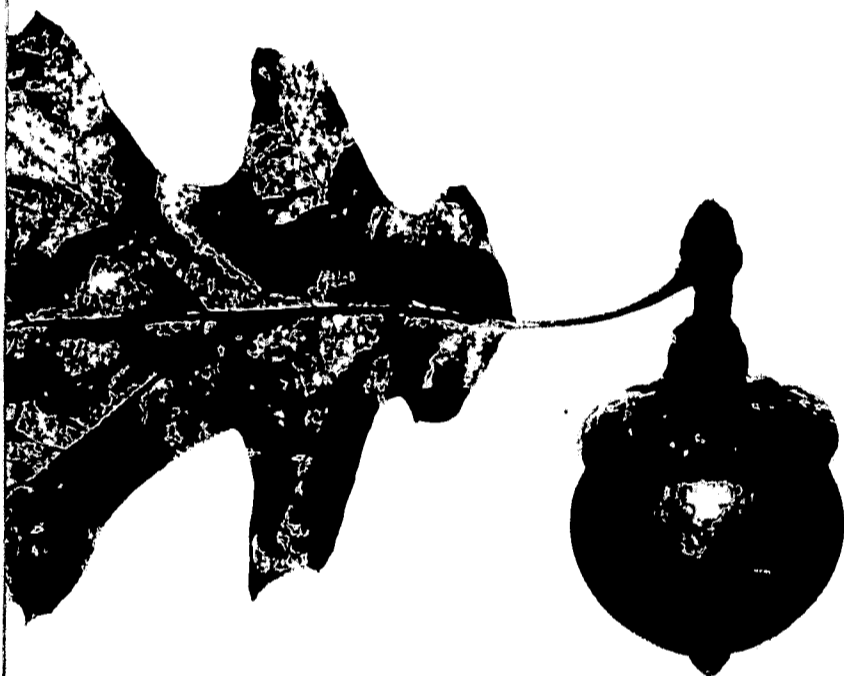
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Advanced Placement Program



The Advanced Placement Program of the College Entrance Examination Board offers an effective way to strengthen both the quality of American education and the articulation between the nation's secondary schools and colleges. Like other programs of the Board, this program is national, its policies are determined by educators, and its operational services are provided by Educational Testing Service (ETS).

Advanced Placement serves the interests of three groups: high school students capable of pursuing college-level studies, secondary schools that desire to offer these students the opportunity of working at an advanced level, and colleges that wish to encourage and recognize such achievement. It is specifically designed to stimulate secondary school students and teachers to higher achievement and, then, to help eliminate the wasteful and depressing duplication of studies at college by providing professional descriptions of college-level courses and the results of the examinations based on these courses to the colleges of the students' choice.

Participating colleges, in turn, consider granting appropriate placement and credit to students who have taken the examinations. Thus the Advanced Placement Program is an instrument of cooperation that extends the educational opportunities available to able, ambitious students by effectively coordinating their individual progression from college-level courses at thousands of schools to appropriate placement at hundreds of colleges.

The course descriptions

Professional consensus on the form that these college-level studies can most usefully take is therefore basic to the Program. This consensus, maintained and reviewed by the committees of examiners, is stated in the following pages as the course description for each of the 11 fields of study presently included in the Program: American history, biology, chemistry, English, European history, French, German, Latin, mathematics, physics, and Spanish. The examining committees of school and college teachers that prepare the course descriptions have allowed for differ-

ences in the patterns of study that may be developed by participating schools. The outlines are kept as general as possible, so that secondary school teachers may enjoy the same creative freedom within the restraints of their disciplines that college teachers require. Thus the teacher is both free and, indeed, obliged to follow his own choices within the Program's general pattern. He must exercise his personal initiative and call upon his individual strengths.

It is important to understand both the necessity of these course descriptions to the Program and the lack of presumption with which they are presented. For, just as it is clearly impossible for participating schools to anticipate the expectations of every department at each college, so too it is impossible for colleges to respond effectively to the results of special programs at hundreds of different schools unless these programs have common goals. The course descriptions are, therefore, not designed to tell schools what they must teach, but rather to explain what form of advanced preparation is most likely to lead to a student's advanced placement in college. Similarly, the descriptions are not meant to indicate what colleges should require, but rather to outline the preparation that can be expected from a recommended candidate.

Thus the Advanced Placement Examinations, based upon the course descriptions, neither measure every form of advanced achievement at school nor identify candidates for every area of possible placement at college. They serve, rather, to distinguish those candidates whose preparation, on the strength of their examination and in the judgment of the readers, can best be likened to the course description. In this respect, as in others, the Program has developed directly and logically from its twin sources.

The background

The Advanced Placement Program grew out of two experiments supported financially by the Fund for the Advancement of Education: the School and College Study of General Education and

the School and College Study of Admission with Advanced Standing. In the early 1950s, these experiments introduced course descriptions and examinations for advanced standing. The Board's Advanced Placement Program, initially assisted by a grant from the Fund, has grown steadily since 1955; and, although it can no longer be regarded as an experiment, it still retains much of the vigor and flexibility of the projects from which it stemmed.

The following table illustrates the growth of the Program under the Board's direction:

<i>Year</i>	<i>Schools</i>	<i>Students taking examinations</i>	<i>Examinations taken</i>	<i>Colleges entered</i>
1955-56	104	1,229	2,199	130
1956-57	212	2,068	3,772	201
1957-58	335	3,715	6,800	279
1958-59	560	5,862	8,265	391
1959-60	890	10,531	14,158	567
1960-61	1,126	13,283	17,603	617
1961-62	1,358	16,255	21,451	683
1962-63	1,681	21,769	28,762	765
1963-64	2,086	28,874	37,829	888
1964-65	2,369	34,278	45,110	994
1965-66	2,518	38,178	50,104	1,076
1966-67	2,746	42,383	54,812	1,133

Establishing the courses

The emphasis of the Advanced Placement Program is on the individual, able student: it serves as a stimulus to his achievement, as an aid for the identification of his academic strengths, and as encouragement for his continuous development through school and college. The basic tenet of advanced placement is that all students do not have equal abilities that develop at the same rate in all subjects. As the weaker student requires a slower pace if he is to learn effectively, so the stronger student should be permitted to proceed more swiftly and meaningfully. It is the Pro-

gram's purpose to provide appropriate examples and examinations of advanced work for the stronger student in order that the college of his choice may recognize what he has, in fact, accomplished.

The Advanced Placement Examinations are open to any student, wherever he may be, and whether he achieved his advanced preparation through special courses, tutorial assistance, or independent effort. The examinations presume, however, a deliberate preparation with reference to the college-level courses outlined here.

There is no formal membership required for a school's participation in the Program. Schools that wish to present candidates are urged to write to their College Board regional office for answers to questions they may have and for information on any of the Program's services. Schools are not expected to submit credentials nor to meet any criteria of accreditation. On the contrary, a participating school is simply one that deliberately prepares a meaningful number of its students for the Advanced Placement Examinations through college-level courses, tutorial instruction, or other means.

Outstanding teachers and students at schools of widely varying size and quality have achieved equally excellent results. Homogeneous grouping, by specific ability and with a specific purpose, is recommended as an important step in the establishment of Advanced Placement classes. But even in schools too small for such divisions, good college-level work has been done.

Such special efforts, of course, are not without expense. Most participating schools have found it necessary to make special financial provision for this advanced work. Teachers who undertake the extra preparation and responsibilities are often relieved of part of their normal teaching load. More and better counseling, new books and laboratory equipment, perhaps additional teachers are needed. Where there is no financial provision for such expenditures, the attainment of the Program's goals is impeded.

Each school will learn best how to select its students and, ac-

ording to its own strengths and facilities, which courses it can best establish. Experience indicates that students chosen on the basis of high intellectual ability and strong motivation are likely to profit most from the challenge of advanced studies. When a school offers an extensive range of Advanced Placement courses, care is often taken lest a student participate in too many. Yet it is just as important that a student with the ability and desire to undertake advanced work be given the opportunity as it is that an overambitious one be restrained.

Small classes are recommended. The teacher of an advanced course needs a lighter teaching schedule to allow for the greater demands of preparation required. Some schools begin advanced work in the junior or sophomore year—or even earlier—and continue advanced work for these students for two or three more years. In schools that are unable to provide special courses, students accomplish their advanced studies through individual tutorial work, often in connection with a regular course. But even if a school can establish only one Advanced Placement course, it will discover that this course has a salutary effect on other courses in the department and on the entire school.

The teachers in a school considering the introduction of advanced courses will wish to consult the course descriptions in this book and the essay sections of recent examinations. They should feel free to communicate with their regional College Board office and the director of the Advanced Placement Program at any time. The Program's examiners and readers, the ETS consultants, other schools already offering the courses, and the faculties of nearby colleges, all constitute important and ready stores of experience and facts. College Board Advanced Placement Program representatives are available for visits to schools with specific problems.

**The school and
the college**

Advanced placement is only one of the many ways that American secondary schools have chosen to accomplish the appropriate education of the stronger student. Under the general

rubric of honors work there is refreshing, fruitful diversity. But one important quality of the Program is that it provides a national link between secondary and higher education. The Advanced Placement Program offers, therefore, through the range of advanced courses at separate schools and colleges, a workable plan for the education of our stronger students.

In addition to sharing this concern for the superior students, schools and colleges that participate in the Advanced Placement Program become partners in its growth, development, and direction. The director of the Program consults with both schools and colleges. The standing committee on Advanced Placement, appointed by the Board to determine Program policy, is composed of teachers and administrators from colleges and schools. The Program is further strengthened by the collaboration of school and college teachers who serve as examiners, readers, and participants at the annual conference in each field of study.

These annual conferences provide an unusual opportunity not only for the teachers to meet and discuss their disciplines, but also for them to learn more about the Program and to help shape it to their needs. It is here that the course descriptions, the examinations, and the grading of papers are reviewed. The Program has been called "the cutting edge of curriculum change," and it is at these annual conferences that the advantages and implications of such changes are considered.

The examinations

The Advanced Placement Examinations are administered once each year in May. The best guide to them, other than the questions from former years, are the course descriptions and sample questions that appear in the following pages. The examinations are prepared in accordance with the definition of the aims and scope of each course as stated by the examining committee.

The choice of test methods may vary from committee to committee and from year to year. But in all examinations essay questions predominate, combined with multiple-choice questions. In the modern foreign languages, listening comprehension sections

are included. Each examination lasts three hours, except for the four Latin examinations, each of which is an hour and a half in length. All examinations are graded on a five-point scale with reference to the content of the course description.

**The student and
his college**

Information concerning the student's promise and performance is provided to the college by the Program and the school. In July the college receives for each student not only a school report, which includes a description of the course, the course grade, and the school's recommendation, but also the student's essay booklet, his examination grade, and a guide to the grade's interpretation and use. Final decisions are then made by the college on the basis of this evidence. In the fall, the college returns the examination, as well as a report of its decision on placement and credit, directly to the candidate's secondary school.

Students who undertake advanced studies with the hope of receiving credit and advanced placement at college must realize that, although the Program provides professional curricular standards and examinations, all colleges do not follow the same, or even similar, procedures. Many colleges grant credit and placement for satisfactory work on the examinations; some grant placement only; others are still establishing their policies. It is clear, however, that greater regularity in the determination and administration of Advanced Placement policies is obtained as colleges gain experience with the Program. Although participating colleges often include clear policy statements in their catalogs, schools that offer advanced courses or are planning to establish them may wish to communicate directly with the colleges that their students plan to attend. And it often remains the candidate's responsibility to apply for credit or proper placement.

Experience has shown that a student, placed appropriately ahead, will benefit appreciably. If, as a freshman, he takes sophomore- or even junior-level courses, he performs as well as or better than many upperclassmen. For there are no longer "freshman" and "sophomore" courses, but rather different kinds of

freshmen, for whom different kinds of courses are required.

The typical candidate for advanced placement will have had one or two college-level courses at his school. Very few, therefore, plan to finish college in less than four years. But the courses completed at school give the college student an opportunity to choose additional electives or to do further study in his major field.

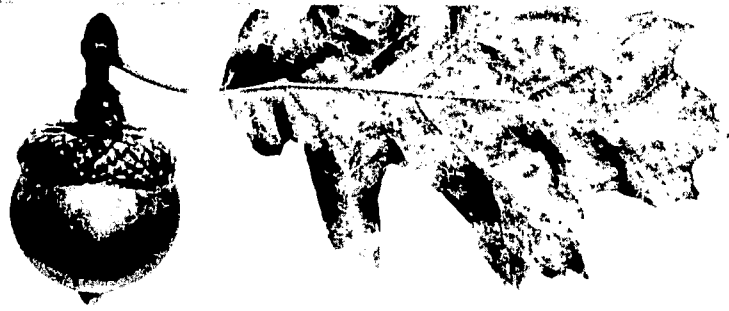
Information

General information about the Program is published in the Board's *Guide to the Advanced Placement Program*. Information of interest to students on all matters relating to the administration of the examinations is available in the *Bulletin for Students* that is distributed in the fall on the basis of orders received from schools. Individual candidates, teachers, and colleges may request copies of either publication directly from College Board Advanced Placement Examinations, Box 592, Princeton, New Jersey 08540.

A special booklet, giving detailed instructions for school coordinators of the Advanced Placement Examinations, is routinely sent to schools that submit a preliminary estimate of the number of candidates they expect to take the examinations the following May. The following brief bibliography lists further titles that supplement the Program's own publications.

- Conant, James B., *The American High School Today*. New York: McGraw-Hill Book Company, Inc., 1959. 140 pp.
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- General Education in School and College*. A committee report by members of the faculties of Andover, Exeter, Lawrenceville, Harvard, Princeton, and Yale. Cambridge, Mass.: Harvard University Press, 1952. 142 pp.
- Paschal, Elizabeth, *Encouraging the Excellent*. New York: Fund for the Advancement of Education, 1960. 80 pp.
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- State Education Department, *Bibliographic Guide for Advanced Placement Spanish*. Albany, N.Y.: State Education Department, 1965. 26 pp.



Course and examination descriptions

The course descriptions and examinations of the Advanced Placement Program, as explained before, are prepared by committees of examiners under the general policy direction of the Committee on Advanced Placement. The descriptions and examinations are continually reviewed on the basis of suggestions and criticisms made throughout the year and at the subject conferences held in June.

The following chapters have been revised for this edition and some new sample examination questions have been added.

AMERICAN HISTORY



An Advanced Placement course in American history should make demands on students that are equivalent to those of an introductory college course. It must give students a thorough grounding in facts, but should go on from these facts to examine their context and significance. Students should learn how to read historical material analytically and critically, to weigh historical evidence and interpretations, and to arrive at conclusions on the basis of informed judgment.

Course American history courses differ from college to college, and teachers in secondary schools should feel free to show initiative and to experiment in their courses. The chronological coverage of an Advanced Placement course varies with the teacher, as is the case with college courses. Teachers are encouraged to be both selective and innovative in the chronological organization of their courses. Although many schools are able to set up special college-level courses, in some schools Advanced Placement study consists of tutorial work that may be associated with a regular course.

Secondary school teachers, like their colleagues in the colleges, differ as to which aspects of American history they consider most important. Almost all teachers avoid giving exclusive attention to any one aspect of American history. But some stress political history; others, economic development; others, intellectual, social, cultural, or diplomatic history; still others, various interpretive themes or historiography. Some of the most successful teachers emphasize materials and concepts from the humanities and the behavioral sciences.

A college textbook may well provide the background for an advanced course, but students should also acquire some knowledge of major documents, historians, and interpretations of American history. They should become familiar with essay examinations, the use and interpretation of maps and other graphic materials, the lecture method of presenting material, note-taking from both printed materials and lectures, and the writing of short research papers. Students should also learn how to cite sources and to credit the ideas and phrases of others. They should be able to express themselves well in correct English.

Most Advanced Placement courses make extensive use of paperback editions of historical works. In addition, students in Advanced Placement courses in American history should have access to an adequate library. The committee recommends that the school subscribe to several scholarly journals, such as the *American Historical Review*, the *Journal of American History*, the *William and Mary Quarterly*, the *Pacific Historical Review*, and the *Journal of Southern History*, as well as a journal of the local state or city historical association. Besides textbooks, the library should contain several hundred carefully selected, important scholarly works in American history that would be augmented annually by new book purchases.

Advanced Placement classes require extra time on the part of the instructor for preparation, personal consultation with students, and correction of a much larger amount of written work than is expected from students in regular classes. The Advanced Placement Committee of Examiners for American History strongly urges that no teacher offer such a class or classes without some reduction in teaching load.

Examination

There will be a substantial choice of essay questions on the examination. The range and open-endedness of these questions make it possible for students from widely differing courses to demonstrate their mastery of information, ideas, and skills. The multiple-choice section consists largely of interpretative questions

designed to test both the students' understanding and the breadth of their preparation. Topics not covered in the essays may be dealt with in the multiple-choice section; for example, while both sections require knowledge of American history since 1750, the multiple-choice section may also include several questions on the seventeenth and first half of the eighteenth centuries. The examiners expect that few students will be able to answer correctly more than two-thirds of the multiple-choice questions. Some questions designed to test the results of curricular innovations may be included in both the essay and multiple-choice examinations, but the examiners will announce in advance in the course description any basic changes in the nature of the examination.

The examination will be three hours in length, with about 45 minutes for the multiple-choice section, 15 minutes for selection of essay questions and organization of answers, and two hours for writing the essays. The sample questions below illustrate the nature of the content, the range of difficulty, and the types of questions used in the examination.

Multiple-choice questions

Following are multiple-choice questions of the kind appearing in the objective section of the examination.

Directions: Each of the questions or incomplete statements is followed by five suggested answers. Select the one which best answers the question or completes the statement.

1. An accurate discussion characterizing the status of American labor during the second half of the nineteenth century might include all of the following EXCEPT the
 - (A) adoption of the eight-hour day in a majority of industries
 - (B) decay of the Knights of Labor
 - (C) organization of the American Federation of Labor
 - (D) use of federal troops to break strikes
 - (E) issuance of injunctions in labor disputes

2. The policies of Franklin D. Roosevelt differed most consistently from those of Theodore Roosevelt with respect to
- (A) actions toward Latin America
 - (B) control of monopolies
 - (C) conservation of natural resources
 - (D) the role of the United States as a world power
 - (E) the need for naval preparedness
3. Which of the following is a correct statement about Roger Williams?
- (A) He strongly objected to the excessive religiosity of the Puritans.
 - (B) He settled in Rhode Island primarily to found a secular community.
 - (C) He began the Great Awakening.
 - (D) He established the principle of separation of church and state in order to protect the Indian and Quaker settlers in Providence Plantations.
 - (E) He advanced the cause of religious toleration and freedom of thought.
4. "The United States is practically sovereign on this continent, and its fiat is law upon the subjects to which it confines its interposition."
- This position was enunciated because of
- (A) Britain's attitude toward the Venezuelan boundary dispute in 1895
 - (B) Spain's attempted suppression of the Cuban Revolution in 1895
 - (C) Russian activities along the west coast of the United States in the 1820's
 - (D) France's activities in Mexico in the 1860's
 - (E) Secretary of State Blaine's desire to clarify United States Pan-American policy

5. "If a merchant surmounted the obstacle placed in his way by anarchy in the currency and confusion in tariff schedules and succeeded in building up an interstate business, he never could be sure of collections, for he was always at the mercy of local courts and juries, agencies that were seldom tender in dealing with the claims and rights of distant creditors as against the clamors of their immediate neighbors."

The conditions described above best characterize the

- (A) colonies between 1763 and 1775
- (B) United States between 1781 and 1789
- (C) western states during the presidency of Andrew Jackson
- (D) Great Plains during the Populist Revolt
- (E) economic situation that was remedied by the Federal Reserve System

6. "We early found ourselves spending many hours in efforts to secure support for deserted women, insurance for bewildered widows, damages for injured operators, furniture from being taken by the installment store. We constantly acted between the various institutions of the city and the people for whose benefit these institutions were erected. Hospitals, county agencies, and state asylums are often but vague rumors to the people who need them most."

This statement was probably made by

- (A) Emily Dickinson
 - (B) Harriet Beecher Stowe
 - (C) Jane Addams
 - (D) Frances Willard
 - (E) Elizabeth Cady Stanton
7. "The administration proceeded from the first on the theory that the economic structure of the country was fundamentally sound. It brought pressure to bear upon industrialists to check

the discharge of employees and wage cutting, issued optimistic statements from time to time, and refused to resort to federal aid to the unemployed."

The administration thus described was that of

- (A) Theodore Roosevelt
- (B) Grover Cleveland
- (C) Martin Van Buren
- (D) Herbert Hoover
- (E) Franklin D. Roosevelt

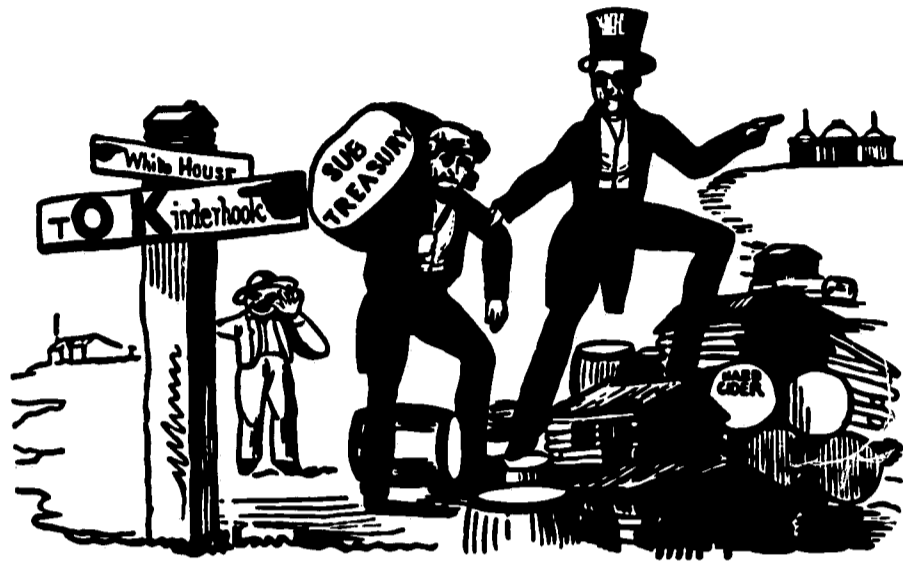
8. The Truman Doctrine and the Marshall Plan had which of the following in common?
- (A) They went into effect during the administration of President Truman.
 - (B) They excluded military aid in favor of economic aid.
 - (C) They excluded economic aid in favor of military aid.
 - (D) They applied to free peoples everywhere.
 - (E) They cost about the same to finance.

Questions 9-11 refer to the following.

- (A) Lincoln Steffens
- (B) Ida Tarbell
- (C) David G. Phillips
- (D) John Spargo
- (E) Upton Sinclair

- 9. Published an exposé of the Standard Oil Company
- 10. Pointed to the corruption linking business and municipal governments
- 11. Described conditions in the meat-packing industry

Questions 12–13 refer to the following cartoon.



12. In which of the following years was this cartoon published?
- (A) 1832
 - (B) 1836
 - (C) 1837
 - (D) 1840
 - (E) 1854
13. The stumbling blocks on the road to the White House were placed there by
- (A) prohibitionists
 - (B) frontiersmen
 - (C) Whigs
 - (D) Democrats
 - (E) Know-Nothings

Questions 14–16 are based on the following statement.

“Upon these considerations, it is the opinion of the court that the act of Congress which prohibited a citizen from holding and

owning property of this kind in the territory of the United States north of the line therein mentioned, is not warranted by the Constitution, and is therefore void; and that neither the plaintiff himself, nor any of his family, were made free by being carried into this territory; even if they had been carried there by the owner, who intended to become a permanent resident.”

14. The congressional act referred to in the passage was the
 - (A) Kansas-Nebraska Act
 - (B) Missouri Compromise
 - (C) Northwest Ordinance
 - (D) Compromise of 1850
 - (E) Fugitive Slave Act

15. The line referred to in the passage was
 - (A) 54° 40'
 - (B) the Mason-Dixon Line
 - (C) 36° 30'
 - (D) the 49th parallel
 - (E) the southern boundary of the Northwest Territory

16. The ideas contained in this decision had earlier been advocated by
 - (A) Stephen A. Douglas
 - (B) Robert E. Lee
 - (C) Daniel Webster
 - (D) Henry Clay
 - (E) John C. Calhoun

Essay questions

The essay portion of the Advanced Placement Examination in American History consists of a list of questions from which three are to be answered with essays of approximately 40 minutes each. The following are sample questions.

17. Select TWO of the following interpretations of an event in American history. Present the evidence for and against each interpretation, and explain your own conclusion.
- (a) "The Republicans' desire to retain political power was responsible for Radical Reconstruction."
 - (b) "Stephen A. Douglas introduced the Kansas-Nebraska Bill because he wanted to win the support of the South for his presidential ambitions."
 - (c) "Woodrow Wilson was responsible for the Senate's rejection of the Treaty of Versailles."
 - (d) "Economic factors caused the American Revolution."
18. "Since 1890, American foreign policy has been dedicated to the proposition that Eastern Asia must not be controlled by a formidable nation." Evaluate the validity of this generalization.
19. What was the effect of the War of 1812 upon the Federalist party; of the Civil War upon the Republican party; and of the First World War upon the Democratic party? In the light of your answer, what generalization can you make about the effect of war upon our political parties?
20. "European culture has both fascinated and repelled Americans." Discuss this generalization with reference to any TWO of the following periods.
- (a) The early years of the American Republic
 - (b) The late nineteenth century
 - (c) The period between the First and Second World Wars
21. To what extent did the measures of the New Deal reflect a coherent economic philosophy?
22. "The large corporations and the unions bear, in certain respects, a similar relation to the American political system. Their advocates believe in associated action for themselves and in com-

petition for their adversaries. They both demand governmental protection and recognition, but resent efficient governmental regulation." Indicate the extent of your agreement or disagreement with this position by reference to the periods 1880-1910 and 1930-1945.

23. "Opposition to the immigrant was primarily rooted in economics and politics." Evaluate this generalization as applied to TWO of the following periods, one before and one after the Civil War.
- (a) The 1790s
 - (b) The 1850s
 - (c) The 1880s
 - (d) The 1920s
24. To what degree were the political ideas and institutions of America in the period 1763-1787 merely transplantations or adaptations of English ideas and institutions? To what degree were they American developments?
25. "Leaders during the 1780s appeared able to dominate events; in the period of the 1850s events seemed to dominate leaders." Do you agree? Explain.

Candidates' answers to essay questions

The Committee of Examiners for American History wants students and teachers to be informed about the types of essay responses that have received certain grades in the past. For that reason, the following examples of two actual answers submitted in the 1965 Advanced Placement Examination in American History are reprinted here without alteration, except for changes in spelling. The candidates, no doubt, would have written in a much better style, had they been able to do a second draft. Even in this examination, however, both candidates might have given more thought to the need for topic sentences and conclusions.

These answers are only two of the thousands that candidates wrote in response to this question. Many other answers received equally high grades. The Advanced Placement readers, a carefully selected group of college professors and secondary school teachers, reach group agreement on grading standards only after careful evaluation of many papers. They reach agreement about the various ways a question might be answered and are always prepared to give high grades to markedly different approaches. No one, therefore, should consider the following samples as "the" answers; because of the thousands of other answers some were graded as high, and many lower, than these. These two answers, therefore, should be considered in this light rather than as ideal answers, flawless in mechanics and perfect in content. For the question below, the readers assigned the first answer a grade of 3 (qualified) and the second answer a grade of 5 (extremely well qualified) on the Advanced Placement scale.

26. Describe and account for the change in reputation of any two of the following Presidents during their terms of office.
- (a) Thomas Jefferson
 - (b) Ulysses S. Grant
 - (c) Woodrow Wilson
 - (d) Harry S. Truman

ESSAY I

"In 1869 the Republicans nominated Grant for President; he was the best vote getter there was and it was feared that the Democrats might gain control of the government again. Grant was elected; he was the 'Savior of the Union.' Once in office Grant proved to be one of the worst presidents ever. He let the Radical Republican Congress do what it wanted to; there was wholesale corruption which took on the name of 'Grantism.' When running for a second term Grant's party split. A number of Republicans were tired of the government corruption

and formed the Liberal Republican party. Grant, however, was elected again in 1873. During his administration there was a depression which Grant failed to do anything about. By the time he was out of office many onetime admirers were his enemies.

"Why did this happen? Grant was a general, he wasn't a politician. His political convictions were not strong and he was easily won over to one side or the other. He didn't attempt to run the government; he let others do what they wanted with it.

"Woodrow Wilson came to office in 1913 advocating what he called the New Freedom. He accomplished his main objectives and reforms in the first part of his administration. (Federal Reserve Act, 1913; Clayton Antitrust Act, 1913; the FTC, 1914; Underwood Tariff, 1913.) When war broke out in Europe the American people counted on Wilson to keep the United States out of the conflict. He was re-elected with the slogan 'He kept us out of war' (1917). After submarine attacks on American ships and foreign ships carrying Americans (Lusitania, 1915) Wilson went before Congress in 1917 and asked that war be declared on Germany. This didn't hurt or change popular opinion of Wilson. The Zimmerman Note and the continued U-boat attacks (after repeated warnings to Germany) had brought many United States citizens to the opinion that Germany wanted war. What really hurt Wilson's reputation was the League of Nations issue. After the war the United States began to isolate itself from the rest of the world. Many people felt that Wilson shouldn't have gone to Paris, where the Versailles Treaty was signed and the League of Nations was founded. When Wilson came back from Europe, he found popular opinion against him. Leading isolationists, like Lodge, had succeeded in getting Congress against the League of Nations plan. Wilson wouldn't compromise, however, and membership in the League of Nations was rejected by the United States.

"The cause for this change in the popular opinion of Wilson was mainly due to Americans' indifference to the rest of the world. The United States wanted to be left alone; she wanted

no more war. Wilson made a mistake in not sensing popular opinion on the League of Nations issue and in not adapting his policies to popular feeling."

ESSAY II

"Ulysses Grant suffered a damaging change in his reputation during the time of his presidency. He entered the White House in 1868 as a war hero. He had won a decisive mandate to lead the country over Horatio Seymour. Although he had no previous political experience, his war record was admirable. When his two terms had finished (in 1876) he was considered a fool and one of the country's worst Presidents ever.

"This was for good reason. He had been shown to have an irregular lack of administrative ability and a great capacity for being duped by his friends. Although never proved to be personally dishonest, he ushered in an era of graft and fraud. Credit Mobilier was probably the most infamous of his scandals. In this scandal, several congressmen were given stock by Congressman Ames to give the Northern Securities Company special rights. Future President Garfield was involved as was the Vice-President. Another incident of this sort occurred when Jim Fisk, a friend of Grant's, and Jay Gould were almost allowed to corner the gold market. Their attempt caused a brief panic. The President's cabinet, a generally undistinguished crew, also indulged in fraud. One example of this was in the Department of the Interior and of War in the treatment of Indians. The President also sanctioned an inconsistent monetary stand that brought on the Panic of 1873. It was not until the second term that the President's reputation really suffered however. In 1872 he smashed the Liberal Republican candidate, Horace Greeley, a reformer. But by the end of Grant's last term even the admired foreign relations gains administered by Hamilton Fish were not enough to save his reputation of stupidity and dishonesty.

"Woodrow Wilson entered the White House on a wave of

progressivism in 1912 (though he received only 42% of the vote). He had been the popular governor of New Jersey. Though somewhat overly intellectual, he had a reputation for efficiency and reform. He certainly reflected the progressive spirit of the people. By the time he left the White House, he was discredited as a hopeless idealist and rejected by the people.

"His first term was triumphant. His progressive reforms, including the Underwood-Simmons Tariff cut, the Federal Reserve Act, the creation of the Federal Trade Commission, enjoyed acclaim. In 1916, he won a slim victory (though the country was basically Republican) for keeping the country out of war. His administration did an admirable job running the war. But after the war, while negotiating the peace, Wilson was caught in the isolationistic tide and his reputation suffered. He made the mistake of appealing for a Democratic Congress (1918) and in bringing no Republicans to the Paris Conference. His idealism was found wanting negotiating in Paris with Clemenceau and Lloyd George and in America gaining Senate ratification. When the treaty was defeated in Congress (in the Wilson form), so was Wilson's reputation. His collapse shrouded the last year of his administration. His reputation was no longer a triumphant Progressive; but a defeated idealist and moralist."

ANSWER KEY TO MULTIPLE-CHOICE QUESTIONS, AMERICAN HISTORY

1-A, 2-A, 3-E, 4-A, 5-B, 6-C, 7-D, 8-A, 9-B, 10-A,
11-E, 12-D, 13-C, 14-B, 15-C, 16-E

BIOLOGY



An Advanced Placement course in biology should meet the objectives of a general biology course on the college level. The aim of the course should be to develop an understanding of the following.

1. *Unity and diversity in living things.* Unity can easily be recognized at the molecular and cellular levels of organization. The occurrence of molecules such as proteins (including enzymes), nucleic acids, and carbohydrates is universal. The pathways of energy metabolism and of synthesis of macromolecules are common to almost all organisms. Cells of widely diverse organisms have common structures and similar mechanisms for uptake of compounds from the environment (selective permeability) and for reproduction. Diversity can be illustrated by comparative studies of cells, tissues, organ systems, organisms, and societies.

2. *The process of inquiry.* Evidence obtained by experiment and observation is used to formulate hypotheses. Hypotheses may eventually become principles or concepts if the supporting evidence becomes extensive enough. The student should be familiar with the evidence that supports the major concepts in biology.

3. *The concept of evolution as an explanation of unity and diversity.*

4. *How to apply biological concepts to new situations and the limits or restrictions on these concepts.*

5. *Homeostasis as a basic biological phenomenon.* Homeostatic mechanisms can be recognized at all levels of biological organization. The student should know how homeostatic mechanisms

involving feedback control operate in mammalian organ systems.

6. *Quantitative measurements made with biological systems.* The following are examples of what can be done in the laboratory to achieve this aim: (a) at the molecular level, studies of enzyme action; (b) at the organismal level, measurements of growth rate, using optical methods for determining either cell number or cell mass of microorganisms (bacteria or yeast, for example); (c) at the population or society level, studies of the distribution of phenotypes. Laboratory experience should also emphasize the collection, analysis, and interpretation of data.

Since a thorough presentation of biology involves the use of concepts learned in chemistry, students taking an advanced course in biology should first complete a course in chemistry.

Good *college* textbooks should be used in an advanced biology course. Some schools may want to use college texts in both zoology and botany. Teachers are urged to seek guidance in selecting texts by writing to the biology departments of the colleges and universities that their students are likely to attend.

Course Introductory college biology courses differ widely in content. Each course represents an attempt to meet the needs, interests, and abilities of a particular group of students. Moreover, the emphasis of a course will vary from year to year depending upon the qualifications of the instructor and the advances being made in research. Despite the many variations, the committee feels that it is possible to describe a representative course.

The course description that follows is to serve as a guide to the secondary school teacher who should feel free to add or substitute materials of his own selection to achieve the aims of the course. The sequence of topics and subtopics does not necessarily represent the order in which they should be presented.

The course description serves as the basis for the construction of the Biology Advanced Placement Examination. A course covering this material should have the equivalent of three class meetings and three laboratory hours a week for 30 weeks.

I. Unity among living things

A. Cell structure and physiology

- 1. Structure as revealed by the light and electron microscopes**
- 2. Localization of cell activities: function of mitochondria, ribosomes, polysomes, centrioles, Golgi bodies, and so forth, and methods of isolation of structures for biochemical study**
- 3. Limitations of the present techniques of cell study in revealing the function of a structure in the living cell**
- 4. Relation of membrane structure to permeability, properties of penetrating particles (such as size, solubility, and charge) and how these are related to passage through membranes, processes of diffusion, osmosis, and active transport**

B. Cell division

- 1. Phases of cell division visible under the microscope**
- 2. Biochemical events such as duplication of DNA and function of mitotic apparatus**

C. Biochemistry

- 1. The student should have an understanding of the following basic aspects of chemistry.**
 - a. Concepts of stoichiometry and chemical equilibria**
 - b. Energetics: free energy change, entropy, and so forth**
 - c. Chemical bonds: covalent, ionic, and hydrogen bonds and relative strength of these bonds (particular emphasis on covalent bonds)**
- 2. Familiarity with properties of water**
- 3. Basic structure of proteins, carbohydrates, lipids, and nucleic acids and methods of isolation of these substances**
- 4. Enzymes**
 - a. Methods of isolation**
 - b. Effect on rate of reaction as opposed to equilibrium**
 - c. Mechanism of action: Formation of enzyme-substrate**

- complex and enzyme turnover, competitive and non-competitive inhibition
- d. Denaturation of enzymes, role of coenzymes, and properties of enzymes that indicate they are proteins
5. Origin of energy sources and their transformation in cells
- a. Photosynthesis
- (1) Structure of chloroplasts, structure of grana, chemistry of chlorophyll, factors affecting synthesis of chlorophyll
 - (2) Dark and light phases of photosynthesis: important chemical reactions in CO₂ fixation, role of light, phosphorylation
 - (3) History of major experiments
- b. Metabolism of carbohydrates, fats, and proteins
- (1) Function of ATP and phosphagens
 - (2) Important chemical reactions of glycolysis, alcoholic fermentation (anaerobic metabolism), and aerobic metabolism (Krebs cycle)
 - (3) Relative efficiency of ATP production in aerobic and anaerobic phases of carbohydrate metabolism
 - (4) Hydrogen and electron transfer systems
 - (5) Types of enzymes
 - (a) Dehydrogenases, carboxylases, oxidases, phosphorylases
 - (b) Major coenzymes and their functions
 - (c) Vitamins in relation to enzymes and coenzymes
 - (6) Fats: beta oxidation, relation to the Krebs cycle and acetyl-CoA, glycerol in relation to enzymes and coenzymes
 - (7) Proteins: deamination and transamination, formation of urea (arginine-ornithine cycle), relation of amino acids to metabolites of Krebs cycle

(8) Synthesis of carbohydrates, fats, nucleic acids, and proteins

(a) Carbohydrates—general structure, synthesis of polymers

(b) Fats—relation to Krebs cycle and acetyl-CoA

(c) Nucleic acids—enzymic methods of DNA and RNA synthesis from nucleotides

(d) Protein synthesis

1) Amino acids derived from Krebs cycle intermediates and essential amino acids

2) Activation of amino acids

3) Role of S-RNA, ribosomes, polyribosomes, and messenger RNA, and familiarity with experiments that led to determination of genetic code (how synthetic polynucleotides direct polypeptide synthesis)

4) Biochemical genetics as it relates to protein synthesis

(9) The use of isotopic tracer techniques in elucidating pathways of metabolism (degradation and biosynthesis)

II. Diversity among living things: structure, function, nutrition

A. Viruses (including phages)

B. Bacteria

1. Aerobic, facultative, and obligate anaerobic respiration

2. Heterotrophic and autotrophic nutrition

3. Role in the carbon and nitrogen cycles

C. Slime molds and true fungi

D. Green algae

1. Reproductive methods

2. Relationship to the evolution of higher plants

3. Alternation of generations

E. Bryophyta

1. Alternation of generations

2. Adaptations to a terrestrial environment both in the vegetative structures and in the methods of reproduction
- F. Tracheophyta: Emphasis should be placed on evolutionary adaptations which improved the adjustment to a terrestrial environment.**
1. Alternation of generations in ferns, gymnosperms, and angiosperms
 2. Angiosperm structure
 - a. Monocot-dicot differences
 - b. Root, stem, leaf, flower—including adaptations for insect pollination, seed, and fruit
 3. Angiosperm physiology
 - a. Water and mineral absorption and transport
 - b. Food translocation and storage
 - c. Growth from seed, cell enlargement and differentiation, maturation—including primary and secondary tissues
 - d. Responsiveness—tropisms and other movements; role of auxins; photoperiodism
- G. Invertebrates: A study of the invertebrates should illustrate the uniformity of animal function that relates diverse forms to each other. It should also trace through various interrelated phyla the adaptive changes that have led to progressive structural specializations. Some of these developments include: multicellularity, tissue and organ differentiation, bilateral symmetry, cephalization, segmentation, and coelom. Organisms demonstrating these changes may be selected from the following phyla.**
1. Protozoa
 2. Coelenterata
 3. Platyhelminthes
 4. Annelida
 5. Arthropoda
 6. Echinodermata

- H. Chordates: structure, function, reproduction, development, and classification. Laboratory study of the structure and function of organ systems of some vertebrate such as a frog, rat, or fetal pig. The student is expected to acquire some familiarity with the invertebrate chordates, the notochord of invertebrate chordates and of vertebrates, and various vertebrate classes. Material from the classes should be used to increase the student's understanding of man.**
- 1. Digestive system: structure, enzymes, nervous and hormonal control, absorption**
 - 2. Respiratory system: the breathing mechanism in an amphibian and in a mammal; gaseous exchange in lungs, gills, and skin; relationship to cellular respiration**
 - 3. Circulatory system: composition and functions of blood and lymph, immunity, homeostatic control of blood composition, patterns of circulation in an amphibian and in a mammal, renal and hepatic portal systems**
 - 4. Excretory system: general structure; detailed structure of a nephric unit and functions performed in each part; relationship of the kidney to homeostasis; sweat glands; the liver as an excretory organ, including urea formation**
 - 5. Skeletal and muscular system: the basic structural plan of the skeleton and the relation of muscles to skeletal movements, ligaments, tendons, antagonistic action of muscles, muscle physiology**
 - 6. Integrative systems**
 - a. Central nervous system: the five major divisions of the brain, functions of parts of the brain and spinal cord, cranial and spinal nerves, types and structure of neurons, nature of the nerve impulse, synaptic transmission, reflex arc, conditioned reflex**
 - b. Autonomic nervous system: structure, function, and neurohumors of sympathetic and parasympathetic divisions; relationship of the sympathetic division to the adrenal medulla**

- c. Endocrine glands: pituitary, thyroid, islets of Langerhans (alpha and beta cells), parathyroids, gonads, adrenals, hormones affecting the digestive glands, relationship of the pituitary to the brain
- 7. Reproductive system
 - a. Structure
 - b. Details of oogenesis and spermatogenesis
 - c. Hormonal control of sperm and egg production and uterine development in mammals
 - d. Fertilization in land and water organisms
 - e. Natural and artificial methods of parthenogenesis
- 8. Development of an animal embryo
 - a. Effects of yolk upon embryological development
 - b. Early embryology of a homolecithal egg
 - c. Early embryology of an amphibian egg through the neurula stage
 - d. Germ layer origins of organ systems
 - e. Formation and function of four extra-embryonic membranes of a reptile or bird
 - f. Formation of the placenta and umbilical cord and their functions
 - g. Pattern of circulation in a mammalian embryo and the changes occurring at birth

III. Continuity of living things

- A. Genetics: Examples from microorganisms, plants, animals, and human beings should be used whenever possible.
 - 1. The primary genetic material: DNA
 - a. Demonstrations of genetic role
 - b. Distribution in cells
 - c. Chemical nature, molecular structure, spatial configuration
 - 2. Transmission genetics: patterns of inheritance
 - a. Mendelian ratios
 - b. Sex-linkage and sex determination

- c. Penetrance and expressivity
- d. Probability
- 3. Chromosomes
 - a. Location, structure, size
 - b. Function in cell reproduction: mitosis and meiosis (involvement in carrying and distributing genes)
 - c. Gross modifications: inversions, translocations, duplications, deletions, ploidy
- 4. Mutations: causative agents, kinds, effects
- 5. Linkage, recombination, chromosome mapping, giant chromosomes
- 6. Gene structure: fine structure analysis in microbial systems
- 7. Gene function: RNA involvement (messenger, transfer, ribosomal) in protein synthesis; gene-enzyme relationships
- 8. The genetic code: nature, reading, universality
- 9. Extrachromosomal inheritance (cytoplasmic, organelar); transformation, transduction
- 10. Population genetics: allele frequency analyses, applications in evolutionary theory
- B. Evolution: Central to the main theme of evolution is the concept of mutation as the ultimate source of genetic change and the diversity of adaptations that result from these changes.
 - 1. Theories of the origin of life
 - 2. Evidence for evolution from biochemistry, morphology, embryology, physiology, paleontology, and geographical distribution
 - 3. Theories of the mechanisms of evolution
 - a. Inheritance of acquired characteristics
 - b. Natural selection as a process of differential reproduction
 - 4. Hardy-Weinberg law: evolution as a change in gene frequencies

5. Role of isolation, ecological opportunity, and adaptive radiation

6. Speciation

IV. Ecological relationships among living things: It is assumed that the relationship between the organism and its environment has received attention throughout the course. The purpose of this section is to summarize the information thought desirable.

A. Physical factors: soil, water, temperature, light, atmosphere, radiation

B. Biotic factors

1. Cycle of the elements (especially carbon and nitrogen)

2. Food chains—relationships with regard to numbers, mass, size, energy flow

3. Symbiosis: mutualism, parasitism, commensalism

4. Succession

5. Social relationships (ants, bees, birds, deer)

Examination The three-hour examination is designed to give students an adequate opportunity to demonstrate their knowledge and understanding of biology. The examination time is equally divided between an objective section, part of which includes experimental situations, and an essay section that offers some choice of questions.

Multiple-choice questions

Examples of the kinds of objective questions that may be used in the examination follow.

Directions: Each of the questions or incomplete statements below is followed by five suggested answers or completions. Select the one which is best in each case.

1. Transplantation experiments involving the dorsal blastoporal lip of an amphibian gastrula indicate that this bit of tissue
 - (A) is destined to be ectoderm
 - (B) does not differ from other tissues of the blastula in any significant manner
 - (C) will cause a concentration of yolk in adjacent cells
 - (D) has the power to organize the axis of symmetry of the developing embryo
 - (E) is so sensitive to its surroundings that it will develop into any embryonic structure depending on its surroundings

2. The group of plants that are the important primary producers in the food chain of the open ocean are the
 - (A) diatoms
 - (B) brown algae
 - (C) red algae
 - (D) dinoflagellates
 - (E) green algae

3. If a large excess of both substrate and activator is present in a mixture containing an enzyme, the rate of breakdown of substrate is likely to be proportional to the
 - (A) substrate concentration
 - (B) free energy change of the reaction
 - (C) product concentration
 - (D) enzyme concentration
 - (E) activator concentration

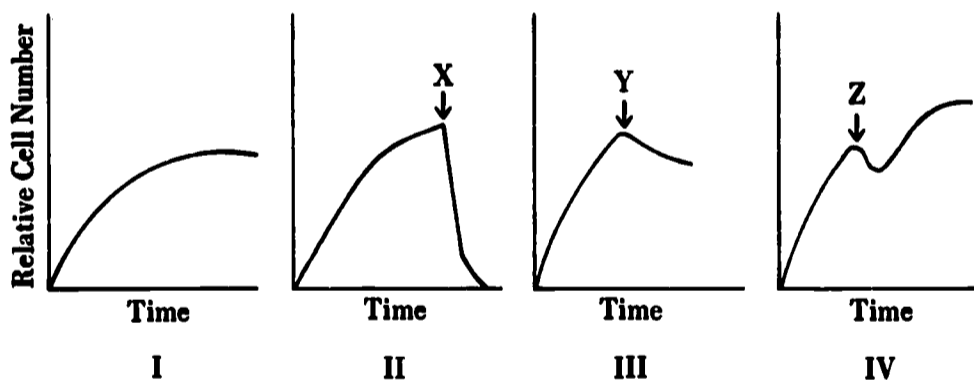
4. The phenomenon which best explains the presence of an extra chromosome in the cells of a human being is
 - (A) inversion
 - (B) linkage
 - (C) segregation
 - (D) nondisjunction
 - (E) crossing-over

5. All of the following statements concerning the light phase of photosynthesis are true EXCEPT:
- (A) An initial event is the excitation of electrons from chlorophyll by light energy.
 - (B) The excited electrons are raised to a higher energy level.
 - (C) If not captured in the reaction, the excited electrons drop back to their initial energy levels.
 - (D) If captured in this reaction, some of the energy of the excited electrons is used to split carbon dioxide to carbon and oxygen.
 - (E) The reaction occurs in grana.
6. The addition of glucose to red blood cells suspended in isotonic salt solution causes the cells to shrink rapidly and then slowly to swell until they return to their initial volume. The most plausible explanation for this behavior is that the
- (A) cell membranes allow water to diffuse more readily than glucose
 - (B) cell membranes are impermeable to water
 - (C) cell membranes are impermeable to glucose
 - (D) cell membranes are permeable to the salt solution
 - (E) cells do not metabolize glucose
7. During the Carboniferous period, all of the following kinds of plants existed EXCEPT
- (A) ferns
 - (B) gymnosperms
 - (C) club mosses
 - (D) angiosperms
 - (E) horsetails

8. Which of the following is **LEAST** consistent with the heterotroph hypothesis of the origin of life?
- (A) There was little, if any, free oxygen in the original atmosphere of the earth.
 - (B) Ammonia and methane were probably the substances from which amino acids were synthesized.
 - (C) The original replicating structure that can be called a cell contained chlorophyll.
 - (C) Natural selection was operating in the chemical evolution of life.
 - (E) Organisms having the ability to carry on fermentation arose earlier than those having the ability to carry on aerobic respiration.

Directions: The group of questions below concerns a laboratory situation. In each case, first study the description of the situation. Then choose the **ONE** best answer to each question following it.

Questions 9–12



The four diagrams above represent growth curves of a certain species of bacterium grown under identical conditions in a liquid medium. In II, III, and IV, substances X, Y, and Z were added at the times indicated by the arrows.

9. If the purpose of the experiment was to determine what effect any one of the substances (for instance, X) had on this bacterium, necessary and sufficient control would be furnished by
- (A) I only
 - (B) IV only
 - (C) I and II only
 - (D) II and IV only
 - (E) I, III, and IV only
10. On the basis of the data given, the bacteria overcame the effects of
- (A) X only
 - (B) Y only
 - (C) Z only
 - (D) Y and Z only
 - (E) X, Y, and Z
11. It was thought that one of the substances X, Y, or Z might act by blocking protein synthesis. Which of the following substances would be most useful in testing this hypothesis?
- (A) C^{14} -labeled proteins
 - (B) C^{14} -labeled amino acids
 - (C) P^{32} -labeled RNA
 - (D) A poison known to inhibit protein synthesis
 - (E) A poison known to inhibit RNA synthesis
12. In order to study the effects of X, Y, and Z on the structure of the bacterial cell wall, which of the following would be the most suitable instrument to use?
- (A) A pH meter
 - (B) An electron microscope
 - (C) A microbalance
 - (D) A spectrophotometer
 - (E) A Geiger counter

Directions: The group of questions below consists of five lettered headings followed by a list of numbered phrases. For each numbered phrase select the one heading which is most closely related to it. One heading may be used once, more than once, or not at all in each group.

Questions 13-16

- (A) Diffusion
- (B) Osmosis
- (C) Active transport
- (D) Pinocytosis
- (E) Sperm and virus penetration

- 13. Movement of dissolved substances (solutes) from regions of higher concentration to regions of lower concentration of the substance
- 14. Mediated by action of lysozyme on cell membranes
- 15. Movement of water across a membrane from a region of higher water concentration to a region of lower water concentration
- 16. Movement of dissolved substances across cell membranes from a region of lower concentration to a region of higher concentration of the substance

Essay questions

Examples of essay questions follow.

- 17. Biologists and biochemists have made outstanding progress within the past quarter century in elucidating the principles and structures which govern the activities of living matter. These areas of progress include:
 - A. the structure and code of the DNA molecule
 - B. the use of radioactive isotopes as tracers in biological processes

- C. the citric acid cycle and its relationship to mitochondria
- D. the use of electron microscopy in revealing the ultrastructure of the cell

Discuss any ONE of these developments and its impact on biological thought and progress. Your answer should include:

- (a) a brief account of the development
- (b) the names of the most prominent investigators involved
- (c) the nature of its impact on biology

18. Irritability or responsiveness to stimuli is a common characteristic of living organisms. Among many others these responses include

- A. geotropic responses in plants
- B. simple reflex responses in animals

Discuss each of these responses. Your answer should include a description of:

- (a) the responses
- (b) an experiment which will demonstrate the responses
- (c) the mechanisms involved in the responses

19. When a cell that is metabolizing in the absence of oxygen is exposed to an oxygen-containing environment, a series of oxidation-reduction reactions is initiated which enables the cell to increase its activities.

- (a) Outline the oxidation-reduction reactions that are initiated under these conditions and indicate the point at which molecular oxygen interacts with the oxidative system.
- (b) Explain how the cell derives additional energy by switching from nonoxidative to oxidative metabolism.

20. Compare the intermediate steps in the fermentation of a molecule of sugar by yeast with respiration in a muscle tissue cell. Include in your answer the role of ATP in energy transfer and the approximate amount of ATP formed in each of these two processes.

21. A major concept of the gene theory of inheritance is that the genes are located in chromosomes. Explain how each of the following helps to establish this idea:
- (a) a genotypic ratio of 1:2:1 in the offspring of heterozygotes
 - (b) the phenomenon of crossing-over
 - (c) other chromosomal aberrations
 - (d) the phenomenon of sex determination, as in man
22. The theory of organic evolution is based on interpretation of observations from diverse areas. Describe the observations from each of the following areas and explain how they support the theory:
- (a) paleontology
 - (b) comparative anatomy *or* embryology
 - (c) biochemistry *or* genetics
23. Discuss the effect of each of the following factors on the rate of photosynthesis in a living plant:
- (a) carbon dioxide
 - (b) light intensity
 - (c) temperature
 - (d) mineral nutrition
 - (e) water concentration
-

ANSWER KEY TO MULTIPLE-CHOICE QUESTIONS, BIOLOGY

1-D, 2-A, 3-D, 4-D, 5-D, 6-A, 7-D, 8-C, 9-A,
10-C, 11-B, 12-B, 13-A, 14-E, 15-B, 16-C



CHEMISTRY

The advanced chemistry course should meet the objectives of a general chemistry course on the college level. Such a course provides an introduction to chemistry by presenting descriptive material as the framework of a discussion of fundamental principles and concepts. The emphasis is on chemistry as an intellectual activity and on the rigorous training in fundamentals needed for future work in it or in related fields.

Students should attain a depth of understanding of fundamentals and a competence in dealing with chemical problems that will enable them to undertake further work in chemistry or related fields with confidence. Students should also develop the ability to think clearly and to express their ideas, orally and in writing, with clarity and logic.

The college elementary chemistry course differs from the usual first secondary school course with respect to the kind of textbook used, the amount and kind of laboratory work done by the student, the amount of time spent by the student on his course, and the emphasis on mathematical formulation of principles and on the solution of arithmetical problems. Qualitative differences appear in the level of textbook and of laboratory work. College textbooks assume a more mature handling of principles and theories than do high school texts. College laboratory work places the emphasis on experimental problems rather than on "exercises"; it assumes a better mastery of theory. Quantitative differences appear in the number of topics treated in the textbook and in the variety of experiments in the laboratory.

The college elementary course also differs from the beginning

high school course in the amount of time spent by the student in class and laboratory, as well as in the vigor and the extent of independent study. If a school wishes to present a course comparable to one that would be offered in a college, it will need to provide not less than 150 minutes for lecture and 180 minutes for laboratory per week. It is assumed that the student will spend approximately six hours a week in unsupervised, individual study.

It is the opinion of many experienced teachers that a greater percentage of Advanced Placement students will be successful if they have had one or two semesters of high school chemistry preceding the college-level course. However, a very good student should not hesitate to take Advanced Placement chemistry as a first course if his schedule will not permit an extra semester or two in a preparatory course.

The advanced work in chemistry should not displace any other part of the student's science curriculum. It is highly desirable that a student have a course in secondary school physics and an uninterrupted program of mathematics. The physics could well precede the college-level chemistry.

Course The level of work expected may best be described in terms of the newer textbooks now being used in the colleges. These indicate the level of achievement but not necessarily the quality of work required. Colleges do not cover in detail all the material in the larger texts. A modern college chemistry text, stressing principles and concepts, with enough descriptive chemistry for illustrative purposes, should be selected. Teachers and administrators who are considering texts are encouraged to visit or correspond with members of the Committee of Examiners for Chemistry, neighboring colleges, and schools where advanced-level chemistry courses have been successfully introduced.

The importance of the theoretical aspects of chemistry has brought about an ever-increasing emphasis on these aspects at the elementary level. Topics such as the structure of matter,

kinetic theory of gases, solution chemistry, chemical kinetics, and the basic concepts of thermodynamics are now being presented in the elementary course in depth approaching that formerly associated with the physical chemistry course. Consequently, if the objectives of a college-level general chemistry course are to be achieved, the teaching *must* be done by a teacher who has completed an undergraduate major program in chemistry, including a year's work in physical chemistry or its equivalent. Only teachers with such training are able to provide adequate breadth and depth in the course and to develop the student's ability to think and reason with the fundamental facts of the science. Because of the breadth and depth of the Advanced Placement course and the extra preparations necessary, the high school teacher of this course should have a teaching load that is lighter than normal.

Chemistry is broad enough and rich enough in detail to permit alternatives in its teaching, and college teachers exercise considerable freedom in methods and arrangements of topics in the effort to reach the objectives of the course. There is no desire to impose greater uniformity on the secondary schools than now exists in the colleges. The following list of topics for an Advanced Placement course in chemistry is intended to be a guide to the level of treatment expected, rather than a syllabus. Level of treatment is more important than the kind of illustrative material used. Probably the best way for the secondary school teacher to understand the level of achievement desired in such courses is for him to discuss the matter with a college teacher of general chemistry.

I. Structure of matter

A. Atomic theory and atomic structure

- 1. Evidence for the atomic theory**
- 2. Atomic weights; determination by chemical and physical methods**
- 3. Properties of nuclei and of electrons**

4. Atomic number and mass number; isotopes and mass spectrography
5. Electron energy levels: atomic spectra, quantum numbers, atomic orbitals
6. Periodic relationships including, for example, atomic radii, ionization energies, electron affinities, electronegativities

B. Chemical bonding

1. Types of bonds; polarity of bonds
2. Geometry of molecules and ions; structural isomerism
3. Relation of geometry to polarity of molecules; dipole moment
4. The hydrogen bond
5. Molecular models
 - a. Valence bond theory: hybridization of orbitals, resonance, sigma and pi bonds
 - b. Molecular orbitals
 - c. Valence-shell electron-pair repulsion theory
6. Binding forces in solids and liquids: molecular, ionic, metallic, and macromolecular (or network)

C. Nuclear chemistry: mass-energy equivalence, transmutation, radioactivity, fission and fusion

II. States of matter

A. Gases

1. Laws of ideal gases; equation of state for an ideal gas; behavior of real gases
2. Kinetic-molecular theory
 - a. Interpretation of ideal gas laws on the basis of this theory
 - b. Dependence of kinetic energy of molecules upon temperature: Boltzmann distribution
 - c. Deviations from ideal gas laws

B. Liquids and solids

1. Differences among solids, liquids, and gases from the kinetic-molecular viewpoint

2. Important physical properties
 3. Phase diagrams of one-component systems
 4. Liquefaction of gases and critical temperatures
- C. Solutions
1. Methods of expressing concentration
 2. Phase diagrams of two-component systems; Raoult's law
 3. Colligative properties: determination of molecular weights; effect of interionic attractions
 4. Types of solutions and factors affecting solubility
- D. Colloidal and macromolecular dispersions
- III. Reactions
- A. Reaction types
1. Formation and breaking of covalent bonds
 - a. Acid-base reactions; theories of Arrhenius, Brønsted-Lowry, and Lewis
 - b. Formation of complexes, amphoterism
 2. Precipitation reactions
 3. Oxidation-reduction reactions
 - a. Oxidation number and the role of the electron in oxidation-reduction
 - b. Electrochemistry; electrolytic and voltaic cells; standard electrode potentials, effect of concentration changes, prediction of the direction of redox reactions
- B. Equations
1. Ionic and molecular species present in chemical systems
 2. Stoichiometry; weight and volume relations, with emphasis on the mole concept
 3. Balancing of equations for redox reactions
- C. Equilibrium
1. Concept of dynamic equilibrium, physical and chemical; LeChatelier's principle; equilibrium constants defined in terms of activities and fugacities

2. Quantitative treatment

- a. Equilibrium constants for gaseous reactions in terms of both molar concentrations and partial pressures
- b. Equilibrium constants for reactions in solution
 - (1) Constants for acids and bases, both molecular and ionic species; pH
 - (2) Solubility product constants and their application to precipitation and the solution of precipitates
 - (3) Constants for complex ions
 - (4) Application to solutions with common ions, for example, buffers

D. Kinetics

1. Concept of rate of reaction
2. Order of reaction and rate constant: their determinations from experimental data
3. Effect of temperature change on rates
4. Energy of activation, transition state theory, and the role of catalysts
5. The rate-determining step in deducing reaction mechanisms

E. Thermodynamic relations

1. Functions of state
2. Heat of formation; heat of reaction, change in heat content (ΔH), Hess' law
3. Heat capacity; heats of vaporization and fusion
4. Free energy of formation; free energy of reaction, change in free energy (ΔF or ΔG); relationship to equilibrium constants and electrode potentials
5. Dependence of free energy on entropy and heat content

IV. Descriptive chemistry

- A. Periodic relationships, both horizontal and vertical
- B. Important elements and typical periodic table families:



oxygen, hydrogen, noble gases, halogens, sulfur family, nitrogen family, carbon, silicon, aluminum, alkaline-earth metals, alkali metals, transition metals

Note: The accumulation of specific facts of chemistry is essential to enable the student both to demonstrate applications of principles and to relate fact to theory in a logical, orderly manner.

- C. Organic chemistry: The study of bonding, bond angles, orbitals, isomerism (cis-trans, optical), unsaturation, aromaticity, and inductive effects can be included under the topic of chemical bonding. As an alternative, these topics can be included as a separate unit which might also include homology and functional groups.
- V. Chemical calculations: The following list summarizes types of problems either explicitly or implicitly included in the preceding material. Proper attention to significant figures and precision of measured values should be observed.
- A. Percentage composition
 - B. Empirical and molecular formulas from experimental data
 - C. Molecular weights from gas density, freezing-point, and boiling-point measurements
 - D. Stoichiometric relations using the concept of the mole; titration calculations
 - E. Gas laws, including the ideal gas law, Dalton's law, and Graham's law
 - F. Molar and molal solutions; mole fraction; normality optional
 - G. Faraday's laws of electrolysis
 - H. Equilibrium constants and their applications including their use for simultaneous equilibria
 - I. Standard electrode potentials and their use; Nernst equation
 - J. Thermodynamic calculations
 - K. Simple kinetic calculations

Laboratory

Because the differences between college and secondary school chemistry are especially evident in the individual laboratory work, the following discussion of desired laboratory work is given in some detail.

There should be a minimum of three hours each week of the school year devoted to the laboratory. Time devoted to class and laboratory demonstrations or to reactions described in the text should not be counted in this three hours each week. Some directed exercises that involve individual observations of chemical substances and reactions, the recording and interpretation of data, and the calculation of results based on individually obtained quantitative data should be carried out. Other investigations that emphasize experimental procedures designed by the individual students should be included. Usually only the question to be studied would be given to the student; the task of planning the steps to be carried out (perhaps eventually modified) and the evaluation and interpretation of the results obtained would be assumed by the student. Some quantitative experiments, done to a precision of within 1 percent, must be performed individually. This will require the use of triple-beam balances sensitive to one centigram or, preferably, analytical balances sensitive to at least one milligram. It is desirable that many of the following areas be represented by experiments.

1. Determination of the formula of a compound, for example, that of silver chloride or of a hydrate.
2. Determination of molar weight by gas density, freezing-point depression, or boiling-point elevation.
3. Determination of equivalent weight by hydrogen displacement, combination with oxygen, acid-base titration, or electrolysis, and so forth.
4. Determination of weight and mole relations in a chemical reaction such as the reaction of carbonate or bicarbonate with hydrochloric acid.

5. Determination of the rate of a reaction.
6. Determination of the equilibrium constant for a reaction.
7. Determination of the energy change associated with a reaction such as that of an acid reacting with a base.

The student should develop an understanding of the experimental meaning of a number of such terms as amphotericism, weak electrolyte, complex ion, oxidation-reduction, shifting of equilibrium, and solution of a precipitate. Before the student has completed his Advanced Placement chemistry course, he should also have had experience with glass working, filtration, titration, the collection and handling of gases, colorimetry, and potentiometric measurements.

Reactions should be performed that illustrate the important descriptive chemistry of oxygen, hydrogen, halogens, sulfur, nitrogen, phosphorus, and the common metals (including a representative or two of transition elements such as copper, chromium, and manganese).

Some of the laboratory work devoted to descriptive chemistry ought to involve analysis of unknown mixtures partially by individually devised schemes and partially by systematic qualitative analysis. The former is more important than the latter.

Throughout the work, emphasis should be on accurate, truthful, and complete observations of experimental results (such as the observation that when water is electrolyzed, the volume of hydrogen as collected is not exactly twice the volume of oxygen). It would be best in the reactions used for descriptive purposes to do others than those described in detail in the text (for example, to dissolve lead rather than copper in nitric acid if the text describes the reaction of the latter metal). Wherever possible, reaction behavior should be related to chemical principles, with emphasis on molecular and electronic structure.

Colleges have reported that some Advanced Placement candidates, while doing well on the examination, have been at a disadvantage because of too little laboratory experience. The report of the high school teacher regarding laboratory work is

important in evaluating the student's readiness for sophomore-level chemistry courses in college.

Examination

The Advanced Placement Examination in Chemistry is divided into two parts. The first part is an hour in length and consists of an objective test with broad coverage. Teachers should not try to prepare students to answer every question on a test of this kind. In order to be broad enough in scope to give every student who has covered an adequate amount of material an opportunity to make a good showing, the test must be so comprehensive that no student would be expected to make a perfect or near-perfect score. Thought-provoking problems and questions based on fundamental topics of beginning chemistry are included.

The second part of the examination is two hours in length and consists of a number of more difficult problems to solve, essay topics to discuss, and chemical equations to complete and balance. The student is allowed some choice among the questions of each type included in the examination. The essays give him an opportunity to demonstrate his ability to think clearly and to present his ideas in a logical, convincing, and coherent fashion. This is an ability that the student must have in order to take his place successfully in advanced undergraduate college courses.

Multiple-choice questions

The following multiple-choice questions are typical of those used in a recent Chemistry Advanced Placement Examination. Each of the questions or incomplete statements is followed by five suggested answers or completions. The student is instructed to select the one that is best in each case.

1. It is found that in 0.01-molar solution the weak acid HA is 1 percent ionized. The value of the ionization constant K_a is approximately
(A) 10^{-2} (B) 10^{-3} (C) 10^{-4} (D) 10^{-5} (E) 10^{-6}

2. A comparison of the electron configurations and atomic radii of beryllium and magnesium (Be: $1s^2 2s^2$; 1.11\AA and Mg: $1s^2 2s^2 2p^6 3s^2$; 1.60\AA) would lead a chemist to expect that
- (A) the ionization potentials of the two elements are the same
 - (B) the Mg atom is a better reducing agent than the Be atom
 - (C) BeCl_2 is more saltlike than is MgCl_2
 - (D) the Mg^{++} ion readily accepts electrons from metallic beryllium
 - (E) both elements form amphoteric hydroxides
3. A 170-gram sample of a dilute aqueous solution of hydrogen peroxide liberated 5.6 liters of oxygen gas (S.T.P.) after complete decomposition in water and oxygen. The concentration of the hydrogen peroxide solution, expressed in percent H_2O_2 by weight, was
- (A) 1
 - (B) 3
 - (C) 5
 - (D) 10
 - (E) 20
4. When solid silver chloride is shaken with a 0.1-molar solution of potassium iodide, most of the silver chloride is converted to silver iodide. This transformation takes place because
- (A) I^- is a better reducing agent than Cl^-
 - (B) silver iodide is less soluble than silver chloride
 - (C) the K_{sp} of AgI is larger than the K_{sp} of AgCl
 - (D) I^- has a larger radius than Cl^-
 - (E) the bond between silver and iodine has less partial ionic character than the bond between silver and chlorine
5. $5 \text{Br}^- + \text{BrO}_3^- + 6 \text{H}^+ = 3 \text{Br}_2 + 3 \text{H}_2\text{O}$

In the rate law $\frac{d[\text{Br}_2]}{dt} = k[\text{Br}^-][\text{BrO}_3^-][\text{H}^+]^2$

for the reaction above, the reaction order with respect to the bromide ion is

- (A) 0
- (B) 1
- (C) 4
- (D) 5
- (E) $k[\text{Br}^-]$

6. The addition of a suitable catalyst to a reaction-mixture of substances J and K which are capable of reacting reversibly to form products L and M
- (A) may increase the proportion of L and M present when equilibrium has been reached
 - (B) catalyzes forward and reverse reactions unequally
 - (C) has no effect on the time required to reach equilibrium but only upon the relative concentrations of substances present at equilibrium
 - (D) has no effect upon the mechanism of the reaction but only upon its rate
 - (E) may lower the activation energy of the reaction

Essay questions

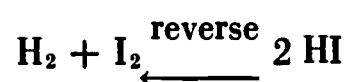
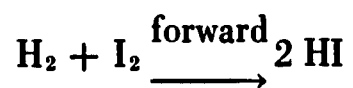
A set of questions that might represent a complete Section II of the Chemistry Examination is reproduced below. Most of the questions are from the May 1967 examination. Students are provided with a periodic chart, a table of logarithms, a table of oxidation potentials, the values for certain constants, and a table showing the vapor pressure of water at various temperatures. The percentages given represent possible score weightings on this section of the examination.

Part A (15 percent): Solve the following problem.

1. When propane is burned in pure oxygen, the reaction proceeds according to the equation
- $$\text{C}_3\text{H}_8(\text{g}) + 5 \text{O}_2(\text{g}) = 3 \text{CO}_2(\text{g}) + 4 \text{H}_2\text{O}(\text{g})$$
- If such an oxidation is carried out on a gaseous mixture prepared by mixing 6.1 grams of C_3H_8 and 11.0 liters of O_2 measured at 1.0 atmosphere and 150°C , what will be the total final volume under the same conditions of measurement after the reaction is complete?

Part B (20 percent): Solve ONE of the two problems. (A second problem will not be scored.)

2. (a) What is the pH of a solution which is 0.030 molar with respect to ammonia and 0.050 molar with respect to ammonium chloride?
- (b) If 0.20 liter of this solution is mixed with 25 milliliters of 0.084-molar sodium hydroxide solution, what is the resulting pH?
- (c) Carry out calculations to determine whether a precipitate of magnesium hydroxide should be expected to form if equal volumes of the solution prepared in (b) and a 0.020-molar solution of magnesium chloride are mixed.
3. The reaction of H_2 and I_2 was studied at $590^\circ C$.



A 500-milliliter steel vessel was charged with 3.02 grams of hydrogen and 25.4 grams of iodine, and the mixture was brought to equilibrium at $590^\circ C$. The equilibrium concentration of HI in the vessel was found to be 0.380 mole/liter.

- (a) What is the equilibrium constant for the reaction at $590^\circ C$?
- (b) If 0.50 mole of hydrogen and 0.50 mole of iodine are mixed in a 3.0-liter flask at $590^\circ C$, how many moles of hydrogen iodide will be present in the mixture when equilibrium is established at this temperature?

Part C (15 percent): Solve ONE of the two problems. (A second problem will not be scored.)

4. The table below shows data obtained from a study of the reaction of components A and B to form C.

	[A], mole/liter	[B], mole/liter	Initial Rate of Formation of C, mole C/(liter)(min.)
Experiment 1	0.0025	0.10	0.0160
	0.0050	0.10	0.0325
	0.0075	0.10	0.0478
Experiment 2	0.20	0.0025	8.0×10^{-4}
	0.20	0.0050	32×10^{-4}
	0.20	0.0075	72×10^{-4}

- (a) What is the order of the kinetics of the reaction with respect to component A; with respect to component B? What is the overall order of the reaction? What is the kinetic rate expression?
- (b) What would be the approximate value of the rate constant if the initial rate for the formation of C is 3.0×10^{-2} mole C/(liter) (min.) with starting concentrations of 0.075 mole/liter of A and 0.025 mole/liter of B?
5. This problem concerns a compound BrCl(g) formed by mixing bromine gas and chlorine gas at 25°C.

	$\text{Br}_2(\text{g}) + \text{Cl}_2(\text{g}) = 2 \text{BrCl}(\text{g})$		
	ΔH_f° , kcal/mole	$^*\Delta G_f^\circ$, kcal/mole	ΔS° , cal/deg.mole
Br ₂ (g)	7.34	0.75	58.64
BrCl(g)	3.51	-0.21	57.34
Cl ₂ (g)	0.0	0.0	53.29

Using the data above, evaluate the following for 25°C:

- (a) The change in standard heat content (enthalpy) $\Delta H^\circ_{22^\circ}$ for the reaction given.
- (b) The equilibrium constant for the reaction given.

$^*\Delta G_f^\circ$ is sometimes designated as ΔF_f° .

Part D (10 percent): Answer FIVE of the eight options given in this part. (Additional choices will not be scored.)

Use appropriate ionic and molecular formulas to show the products of the following reactions which occur in aqueous solution except as indicated. Omit any ionic or molecular species which do not take part in the reaction. You need not balance.

6. $\text{PbCl}_2(\text{s}) \text{ moist} + \text{H}_2\text{S}(\text{g}) \rightarrow$
7. $\text{NaOH}(\text{s}) \text{ moist} + \text{CO}_2(\text{g}) \rightarrow$
8. $\text{AgCl}(\text{s}) + \text{NH}_3(\text{aq}) \rightarrow$
9. $\text{MnO}_4^-(\text{aq}) + \text{H}^+(\text{aq}) + \text{I}^-(\text{aq}) \rightarrow$
10. $\text{PCl}_3 + \text{H}_2\text{O} \rightarrow$
11. $\text{H}_2\text{O}_2(\text{aq}) \text{ (heated)} \rightarrow$
12. $\text{Hg}(\text{l}) + \text{HNO}_3 \text{ (concentrated)} \rightarrow$
13. $\text{BF}_3(\text{g}) + (\text{CH}_3)_3\text{N}(\text{g}) \rightarrow$

Part E (20 percent): Select THREE from the following six topics.

Spend about 30 minutes on this part of the examination. Brief and specific answers are preferable to broad, diffuse responses. Illustrative examples and equations may be helpful.

14. The equation of state, $pV = nRT$, applies to an ideal gas. Discuss two factors which cause nonideality.
15. Cite some of the facts that support the theory of hydrogen bonding.

16. Suppose that you are given the value of the first ionization potential for a metal. Using this factor, what other information would you need to determine the value of the oxidation potential for the formation of the univalent cation of the metal?
17. In general, the value of the equilibrium constant for any chemical system in equilibrium varies with the temperature. For a specific system in equilibrium, what determines the effect a temperature increase will have on the value of the equilibrium constant?
18. For the titration of 0.1-molar acetic acid with 0.1-molar sodium hydroxide, what factors need to be considered in selecting an indicator?
19. Two substances with the formula $[\text{Co}(\text{NH}_3)_4\text{Cl}_2]\text{Cl}$ have been isolated. Both have the same magnetic susceptibility. What structures consistent with these data can you suggest for the two substances?

Part F (20 percent): Select one of the essay topics presented below and spend about 30 minutes on it. The essay question is included to give you an opportunity to demonstrate your ability to think clearly and to present your material in logical, convincing, and coherent English. The essay will be judged on the basis of the accuracy and the importance of detail cited, the appropriateness and the scope of the descriptive material used, and its organization. The use of diagrams, equations, or tables may help.

20. You are given a good voltmeter, some sheet zinc and sheet silver, solid zinc nitrate and silver nitrate, and access to other materials and apparatus you may need.
 - (a) Describe how you would set up a silver-zinc cell.
 - (b) Discuss the means you would use to obtain quantitative measurements of E° for your cell, the equilibrium constant

of the cell reaction, and the solubility product constant of silver chloride.

21. The elements in the first period of eight exemplify the variation of physical and chemical properties of the elements.
- (a) Select two or three physical properties and two or three chemical properties; discuss the nature of the variation of each of these selected properties among the elements in the first period of eight.
 - (b) Select any two elements in the first period of eight and compare the chemical properties of their oxides and hydrides (binary compounds with hydrogen) with the similar compounds of the corresponding elements in the first period of eighteen.

**ANSWER KEY TO MULTIPLE-CHOICE
QUESTIONS, CHEMISTRY**

1-E, 2-B, 3-D, 4-B, 5-B, 6-E

ENGLISH



A student in an Advanced Placement course in English reads literature and writes about it as well as do students in introductory college courses in literature and composition.

Criteria for selecting students

Candidates for an Advanced Placement course in English should have superior aptitude for reading literature perceptively and for expressing their responses to what they have read. To be ready for the course in the twelfth grade, most students need to have studied literature intensively for at least two years, during which time they must have had continuous practice in organizing information and using language critically. Candidates also need to be doing well enough in their other courses to give to the Advanced Placement English course the additional time and effort it requires of them.

The teacher

The teacher of an Advanced Placement English course needs to create within his section the flexibility and intimacy of a seminar. To give adequate instruction he should work with a small group of 10 to 15 students, certainly not more than 20. In conducting an Advanced Placement class, the teacher functions in a sensitive and responsive manner as discussion leader, questioner, critic, and scholar, helping the members of his class to assume much of the responsibility for their own learning. Occasionally he lectures. In class, he should encourage each student to par-

ticipate thoughtfully and effectively in the discussions. Outside of class, he should confer frequently with each student to assist him with his writing and rewriting. At least once a week the teacher assigns a short paper. Occasionally he asks for essays to be written in class. Longer writing assignments lead the student to schedule his preparation, writing, and revision over several weeks.

The Advanced Placement reading list need not differ entirely from that followed in regular sections, but the Advanced Placement teacher and his students must have access to a good library. In selecting the books to be studied in class, the teacher should be guided by the following principles: (1) the student should be able to rely on his own reading rather than on secondary sources; and (2) the student should be expected to read only that number of works that can be studied well, although he is encouraged to undertake wider, independent reading.

Course Literature

In the Advanced Placement course in English, the student learns how to read and respond to works of literature and how to express himself about them. He studies the work itself: its use of literal and figurative language; its characters, action, and themes. From his observation of details he moves to a consideration of structure and meaning. The student uses the historical context and the author's life as background for his understanding of a work of literature.

The student should learn the difference between a primary and a secondary source. After he has read a work and begun to formulate his own response to it (and perhaps discussed it with his fellow students and his teacher), he may wish to supplement his response by reading secondary material: By using the work of others, properly acknowledged, the student learns how scholarly papers are written. However, his concern is with reading the text as well as he can, and only sometimes will he find it useful

to read and to use secondary material. He will be discouraged from referring to popular outlines.

In the Advanced Placement course, the student reads poems, plays, prose fiction, and expository literature. He studies intensively a representative sampling from the various genres and periods to prepare himself for wider independent reading. Through the study of more than one work of an author, the student may also observe consistency and variety in the use of themes and language within that author's canon. In class discussion and in critical writing he is responsible for showing that he has read perceptively and for presenting and defending his insights. He demonstrates his development by his growing ability to work with what he has read.

The Advanced Placement student's literary background should include a knowledge of the Bible, Homer, and Greek and Roman mythology. Most of his assigned reading will be in texts originally written in English, but works in translation of such authors as Sophocles, Cervantes, Molière, Chekhov, Ibsen, Dostoevsky, and Tolstoy are appropriate and helpful corollary reading.

The following list suggests authors and works for reading in Advanced Placement English. *If the list is read as a prescriptive syllabus, it will be misunderstood. It is a series of appropriate examples of authors and of works.* The arrangement is chronological within each genre. Probably the most useful syllabus designed from these suggestions will include a few works from each of the genres. Another syllabus might place greater emphasis on some genres than on others, might select works comparable to those suggested, might select reading related to a particular theme, or might follow a chronological course through a variety of genres.

POETRY

Narrative

Milton, Pope, Wordsworth, Browning, Tennyson, Hardy, Robinson, Eliot

Lyric

Wyatt, Sidney, Jonson, Shakespeare, Donne, Herrick, Herbert, Milton, Marvell, Blake, Burns, Wordsworth, Byron, Keats, Tennyson, Browning, Arnold, Dickinson, Hardy, Hopkins, Yeats, Frost, Auden, Roethke, Lowell

DRAMA

Tragedy

Shakespeare, *Romeo and Juliet*, *Othello*
O'Neill, *Desire Under the Elms*, *A Long Day's Journey into Night*
Miller, *Death of a Salesman*, *A View from the Bridge*
Williams, *A Streetcar Named Desire*

Comedy

Shakespeare, *Twelfth Night*, *The Tempest*
Jonson, *Volpone*, *The Alchemist*
Congreve, *The Way of the World*
Goldsmith, *She Stoops to Conquer*
Sheridan, *The School for Scandal*
Wilde, *The Importance of Being Earnest*
Shaw, *Man and Superman*, *The Devil's Disciple*

History

Shakespeare, *Henry IV, Part I*
Shaw, *St. Joan*

PROSE FICTION

Novel

Fielding, *Joseph Andrews*
Austen, *Pride and Prejudice*, *Emma*
Hawthorne, *The Scarlet Letter*
Dickens, *Hard Times*
Brontë, *Jane Eyre*
Brontë, *Wuthering Heights*
Eliot, *Adam Bede*
Twain, *Huckleberry Finn*
Hardy, *Tess of the D'Urbervilles*, *The Mayor of Casterbridge*
James, *Washington Square*, *The Portrait of a Lady*
Conrad, *Victory*, *Heart of Darkness*

Joyce, *A Portrait of the Artist as a Young Man*
Fitzgerald, *The Great Gatsby*
Faulkner, *The Bear, Light in August*
Hemingway, *The Sun Also Rises, A Farewell to Arms*
Greene, *The Power and the Glory, The Heart of the Matter*
Malamud, *The Natural*
Bellow, *Seize the Day*

Short story

Hawthorne, Melville, Conrad, Crane, Joyce, Lawrence, K. A. Porter, Faulkner, Hemingway, McCullers

Allegory and satire

Bunyan, *The Pilgrim's Progress, I*
Swift, *Gulliver's Travels*

EXPOSITORY LITERATURE

Addison, Steele, Johnson, Boswell, Lamb, Hazlitt, Carlyle, Emerson, Mill, Thoreau, Arnold, T. H. Huxley, Mencken, E. B. White, Orwell, James Baldwin

Composition and language

The Advanced Placement student learns to write clearly and logically about his understanding of themes and of the specific details that embody those themes. He learns to select and introduce quotations from a text and to illustrate his statements with specific details. Through his reading, and also through the experience of his own writing and rewriting, he develops sensitivity to nuances in the use of language; to connotation, metaphor, irony, paradox; to patterns and shifts in syntax, in tone, in point of view.

Writing assignments need not always cover a literary topic. They may also include personal essays, narrative or descriptive compositions, expository and argumentative essays, and paragraphs in which the student comments on a selected passage. In general, class discussions and writing assignments require the

student to demonstrate both his sensitivity to the language and structure of a piece of writing and his own power and precision in organizing, revising, and expressing ideas. As speaker and writer, he is aware of his own voice and of the intellect and sensibility of his audience. He tries to be honest, exact, and concise in his use of language.

Examination Yearly, the Committee of Examiners for English prepares a three-hour examination that gives the student the opportunity to demonstrate his mastery of the competencies described in the course of study. Each year's examination asks new questions, but from year to year the level and scope of the examination remain the same. Except for a short multiple-choice section that tests the student's reading of a selected passage, the examination calls for essay responses. Students are expected to use as examples works of recognized literary merit.

The primary value of an Advanced Placement Program lies in the course itself and in the experience it offers the student whether or not he ultimately receives credit or advanced placement or both in his college. Although a teacher in the program should not teach for a specific Advanced Placement Examination, his teaching should reflect an awareness of the kinds of questions that are asked on Advanced Placement Examinations.

Questions from previous examinations, including the 1966 examination in full, are presented here as examples of the kinds of questions asked.

Sample essay questions

1. "In many novels and plays, minor characters contribute significantly to the total work. They often have particular functions, e.g., as instruments in the plot, foils to the main characters, commentators on the action and theme, and the like."

Write a well-organized essay showing how three minor characters function in the works in which they appear. Select the

characters from two or three works (novels or plays). You must use works by one or more of the following authors:

Jane Austen	Ernest Hemingway
Joseph Conrad	Henry James
Charles Dickens	Herman Melville
George Eliot	Eugene O'Neill
William Faulkner	William Shakespeare
F. Scott Fitzgerald	George Bernard Shaw
Thomas Hardy	Richard Brinsley Sheridan
Nathaniel Hawthorne	Mark Twain

2. The following poem refers to these circumstances:

Ulysses has been gone so long from Ithaca that many presume him dead. Penelope, his wife, is being wooed by persistent suitors who carouse in Ulysses' house. She has promised to choose one of them after she has finished the garment she is weaving. Every night she undoes the work she has completed during the day.

*The Return**

The doors flapped open in Ulysses' house,
The lolling latches gave to every hand,
Let traitor, babbler, tout and bargainer in.
The rooms and passages resounded
With ease and chaos of a public market,
The walls mere walls to lean on as you talked,
Spat on the floor, surveyed some newcomer
With an absent eye. There you could be yourself.
Dust in the nooks, weeds nodding in the yard,
The thick walls crumbling. Even the cattle came
About the doors with mild familiar stare
As if this were their place.
All round the island stretched the clean blue sea.

*From *Collected Poems* by Edwin Muir. Copyright © 1960 by Willa Muir. Reprinted by permission of Oxford University Press, Inc.

Sole at the house's heart Penelope
Sat at her chosen task, endless undoing
Of endless doing, endless weaving, unweaving,
In the clean chamber. Still her loom ran empty
Day after day. She thought: 'Here I do nothing
Or less than nothing, making an emptiness
Amid disorder, weaving, unweaving the lie
The day demands. Ulysses, this is duty,
To do and undo, to keep a vacant gate
Where order and right and hope and peace can enter.
Oh will you ever return? Or are you dead,
And this wrought emptiness my ultimate emptiness?'

She wove and unwove and wove and did not know
That even then Ulysses on the long
And winding road of the world was on his way.

—Edwin Muir

Write a carefully planned essay intended to help another reader to understand the poem. In your essay you should consider the organization of the elements of the poem.

- (a) What is the major contrast between Stanza 1 and Stanza 2?
- (b) What particular uses of language express this contrast?
- (c) What is the poet's attitude toward the situation he describes, and how is it expressed?

3. Read the passage and all the questions carefully before you begin to write your answers.

It was eight o'clock in the evening before the door opened and his wife entered. He dared not look up at her. He sat with his eyes bent down, and as she went towards him she thought he looked smaller—he seemed so withered and (5) shrunken. A movement of new compassion and old tenderness went through her like a great wave, and putting one hand on his which rested on the arm of the chair, and

the other on his shoulder, she said, solemnly but kindly—

(10) "Look up, Nicholas."

He raised his eyes with a little start and looked at her half amazed for a moment: her pale face, her changed, mourning dress, the trembling about her mouth, all said, "I know"; and her hands and eyes rested gently on him.

(15) He burst out crying and they cried together, she sitting at his side. They could not yet speak to each other of the shame which she was bearing with him, or of the acts which had brought it down on them. His confession was silent, and her promise of faithfulness was silent. Open-

(20) minded as she was, she nevertheless shrank from the words which should have expressed their mutual consciousness, as she would have shrunk from flakes of fire. She could not say, "How much is only slander and false suspicion?" and he did not say, "I am innocent."

(a) Answer the following questions in a sentence or two.

1. In the first four sentences, how is the wife made to seem superior to the husband?
2. What do the author's comments throughout the passage reveal about the character of the wife?
3. What is achieved by having neither character speak except for the three words the wife says?
4. What effect does the author achieve by his emphasis on physical movements and gestures?
5. To what use is the word *and* put in lines 14, 19, and 24?

(b) Considering your study of the entire passage, decide upon the attitude of the wife to the husband, and of the husband to the wife. In a paragraph or two, contrast and compare their attitudes toward each other.

1966 examination

SECTION I

Part A

Read the following poem several times before you attempt to answer the questions that follow. Then, for each question, select the answer that you think best, and blacken the corresponding space on the answer sheet.

Like as the waves make towards the pebbled shore,
So do our minutes hasten to their end;
Each changing place with that which goes before,
In sequent toil all forwards do contend.

- (5) Nativity, once in the main of light,
Crawls to maturity, wherewith being crown'd,
Crooked eclipses 'gainst his glory fight,
And Time that gave doth now his gift confound.
Time doth transfix the flourish set on youth
- (10) And delves the parallels in beauty's brow,
Feeds on the rarities of nature's truth,
And nothing stands but for his scythe to mow:
And yet to times in hope my verse shall stand,
Praising thy worth, despite his cruel hand.

1. When does the speaker first indicate that the poem is a compliment to someone?
- (A) At the beginning of the first quatrain
(B) At the end of the first quatrain
(C) In the second quatrain
(D) In the third quatrain
(E) In the concluding couplet

2. The image in the first two lines suggests all of the following EXCEPT:
- (A) Life has a regularity and rhythm of its own.
 - (B) The course that life follows is beyond the control of man.
 - (C) Life moves hurriedly toward its end.
 - (D) The will to live is fundamental to man's accomplishments.
 - (E) The end toward which all men move is natural and unavoidable.
3. Throughout the poem, the poet expands his ideas chiefly by means of
- (A) simile (B) paradox (C) hyperbole
 - (D) antithesis (E) personification
4. Line 3 can best be interpreted as meaning that
- (A) life is monotonous
 - (B) the world is constantly changing
 - (C) no moment of life is ever repeated
 - (D) man is helpless against the forces of nature
 - (E) no moment of life is without a struggle
5. "In sequent toil all forwards do contend" (line 4) is an accurate description of all of the following EXCEPT the
- (A) movement of the waves toward the shore
 - (B) succession of the moments of our lives
 - (C) movement of life toward its close
 - (D) progression of time
 - (E) struggle between the waves and the shore
6. "Nativity" (line 5) can best be interpreted to mean
- (A) birth and infancy
 - (B) ignorance
 - (C) Christ's birth
 - (D) the rising of the sun
 - (E) innocence

7. In lines 5–7, the speaker describes life as a
- (A) movement from illusion to reality
 - (B) movement from promise to promise without sign of fulfillment
 - (C) movement that is unpredictable in its course
 - (D) struggle to secure a mature outlook despite constant lack of fulfillment
 - (E) struggle to maintain achievements despite adverse fortune
8. Which of the following comparisons is NOT made in the poem?
- (A) Sea . . . time
 - (B) Youth . . . age
 - (C) Past . . . future
 - (D) Light . . . darkness
 - (E) Destruction . . . immortality
9. The words “being crown’d” (line 6) can best be interpreted to mean
- (A) reaching old age
 - (B) reaching fulfillment
 - (C) achieving wisdom
 - (D) adjusting to life
 - (E) completing the struggle of life
10. The major images in lines 5–7 involve
- (A) hope and despair
 - (B) appearance and reality
 - (C) light and darkness
 - (D) glory and ignominy
 - (E) straightness and crookedness

11. The metaphor in line 10 refers specifically to a
(A) philosopher's probing an idea
(B) farmer's plowing a field
(C) mathematician's drawing lines
(D) man's seeking his reflection
(E) warrior's stabbing with a spear
12. Lines 9-10 can best be interpreted to mean that Time
(A) permits no man to enjoy his youth
(B) strikes at the vigor and success of youth
(C) is an enemy to all who prize only physical beauty
(D) prefers the signs of age to the signs of youth
(E) allows even the young to die
13. Line 11 suggests that Time
(A) preys upon the best in nature
(B) exists to support the superior and the beautiful
(C) yields only to the best in nature
(D) is the guardian of the natural order
(E) is the greatest enemy of those who seek knowledge
14. Which of the following is the best interpretation of line 12?
(A) Everything ends at its appointed time.
(B) Time begins things, even as it ends them.
(C) Death is all that man looks forward to.
(D) Everything lives to be destroyed.
(E) Nature's truth ultimately cuts down all mortal things.
15. In the concluding couplet, the speaker hopes that
(A) he will survive the ravages of time
(B) his poem will be immortal
(C) his friend will not lose youth too quickly
(D) his friend will continue to deserve the praise the speaker is giving him
(E) his poem is worthy of the virtues his friend represents

16. The images of the third quatrain serve primarily to
- (A) provide emotional relief from the tension developed in the first two quatrains
 - (B) reinforce the meaning of the poem by understating the main idea
 - (C) provide a generalization derived from the examples presented in lines 5-8
 - (D) elaborate upon the personification introduced in line 8
 - (E) provide a contrast with the images used in the first two quatrains
17. Which of the following is the major idea developed in lines 1-12?
- (A) The inexorable movement of time destroys all.
 - (B) Age withers the beauty of man.
 - (C) Death destroys whatever glory a man has achieved.
 - (D) Death and decay lie in wait for all.
 - (E) The poet confers immortality on man.
18. The mood of lines 1-12 can best be described as
- (A) consistent, but intensified as the poem develops
 - (B) moving from the impersonal to the intensely personal
 - (C) shifting with each quatrain without any intensification
 - (D) consistent for the first two quatrains, but shifting in the third
 - (E) shifting after the first quatrain, but consistent for the next two

19. Which of the following best describes the speaker's approach to his subject in lines 1-12?
- (A) He states his theme in general terms in the first quatrain and expands it by using specific, personal illustrations in the second and third quatrains.
 - (B) He states his theme in the first quatrain, explaining it first in terms of the natural world and then in terms of a stylized world; in the third quatrain he moves back to the natural world to make the general statement of the theme and its relationship to all men.
 - (C) He states his theme in the first quatrain and expands upon it in succeeding quatrains, each time becoming more explicit about the relationship of the theme to man.
 - (D) He introduces the theme in the first quatrain, but does not fully state it until the second; the third quatrain is a further expansion of the second.
 - (E) He introduces the theme in the first quatrain and expands the introduction in the second; the third finally states the theme in general terms.

Part B

- Like as the waves make towards the pebbled shore,
So do our minutes hasten to their end;
Each changing place with that which goes before,
In sequent toil all forwards do contend.
- (5) Nativity, once in the main of light,
Crawls to maturity, wherewith being crown'd,
Crooked eclipses 'gainst his glory fight.
And Time that gave doth now his gift confound.
Time doth transfix the flourish set on youth
- (10) And delves the parallels in beauty's brow,
Feeds on the rarities of nature's truth,
And nothing stands but for his scythe to mow:
And yet to times in hope my verse shall stand,
Praising thy worth, despite his cruel hand.

In the multiple-choice questions, you have examined many aspects of this poem. Now, in a short essay, discuss the relationship of the final two lines to the first twelve. In your answer, consider the poet's attitude (emotional response) toward the central concerns of the poem.

Do NOT quote phrases and sentences found in the multiple-choice questions.

SECTION II

Part A

"Comedy, in a sense, is no less serious than tragedy. Where tragedy shows us the god-like qualities of man, comedy shows us his humanity. Tragedy is personal; comedy is social."

In a unified essay, examine the validity of this statement. To substantiate your argument, use specific illustrations from TWO plays of literary merit, one a tragedy and one a comedy. Do NOT merely summarize the plots.

Part B

I never lost as much but twice,
And that was in the sod.
Twice have I stood a beggar
Before the door of God!

Angels, twice descending,
Reimbursed my store.
Burglar, banker, father!
I am poor once more!

After several careful readings of this poem, write an essay organized according to the following plan:

1. Make a literal paraphrase (full prose statement) of the events described in lines 1 through 6.

2. Paying particular attention to the choice and the order of words, analyze the speaker's attitudes toward God and toward himself as they are revealed in lines 7 and 8.

Part C

"An individual's struggle toward understanding and awareness is a traditional subject for the novelist."

In an essay apply this statement to ONE novel of literary merit. Organize your essay according to the following plan:

1. Compare the hero as we see him in an early scene with the hero as we see him in a scene near the end of the novel.
2. Describe the techniques that the author uses to reveal the new understanding and awareness the hero has achieved.

Do NOT merely summarize the plot. Be specific in your illustrations.

GUIDELINES TO ESSAY ANSWERS

The members of the Committee of Examiners for English offer the statements below as brief descriptions of how the essay questions on the 1966 examination were answered.

- IB. Although no one particular interpretation of the poem was expected, the successful candidates identified, in well-written paragraphs, the images of water, light, and earth. They commented on the destructiveness of time and on the contrast between the first twelve and the last two lines (the power of verse to confer immortality).
- IIA. In addition to writing about a comedy as well as a tragedy, the successful candidates, in well-written essays, took the opportunity to examine and evaluate the statement. They wrote about such apparent opposites as tragedy and comedy, and god-like and human qualities. They also related the apparent opposites to one another.

- IIB.** The successful candidates understood the figurative uses of language in the poem and saw the poem as an expression of repeated losses through death. Those candidates who could not understand the figurative uses of language saw the poem as an expression of crop failure and the like. The successful candidates interpreted the speaker's contradictory and complementary attitudes toward God in the last two lines.
- IIC.** The successful candidates chose acceptable novels and, in well-written essays, compared specific scenes. They showed their ability to work with literary techniques. The less able candidates did not focus on early and late scenes, but merely summarized, and did not work with techniques.

**ANSWER KEY TO MULTIPLE-CHOICE
QUESTIONS, ENGLISH**

**1-E, 2-D, 3-E, 4-C, 5-E, 6-A, 7-E, 8-C, 9-B, 10-C,
11-B, 12-B, 13-A, 14-D, 15-B, 16-D, 17-A, 18-A, 19-C**

EUROPEAN HISTORY



The Committee of Examiners in European History of the College Board's Advanced Placement Program believes that however much introductory college courses in the subject may differ they demonstrate a common level of quality and approach. In drafting a description of an Advanced Placement course in European history, therefore, the committee has not attempted to describe a particular Advanced Placement course in detail. It has tried instead to indicate the general coverage and the common elements of quality and approach characteristic of any course properly qualifying students for college credit.

Experience suggests that the school course should be taken in the senior year, although it has been offered successfully in the junior year or even spread over both years. It may be conducted in a variety of ways. Some schools have organized special courses or advanced sections. Others have not found that possible and instead have made extra guided work available only to exceptionally promising students.

The committee makes three recommendations to any school that decides to prepare students for the College Board's Advanced Placement Examination in European History. First, the school library should be regularly reviewed and materials added to it that would enrich the course. Second, teachers should encourage students to work independently to the fullest extent that circumstances and materials permit. Third, school administrators, if it is at all possible, should give teachers of Advanced Placement courses additional time for their work with students and for their own study.

Course Coverage

The scope of an Advanced Placement course in European history may best be described by two aspects of the study of European history that will be tested by the examination.

First, the student should have a reasonably detailed knowledge of the narrative of European history from 1500 to 1945 as presented in any college-level textbook. In respect to the years before 1500 (Prologue) and after 1945 (Epilogue), he need have only such general knowledge of ideas and institutions as the topics listed below suggest. He will not be expected to answer essay questions on the material in the Prologue or in the Epilogue.

Second, the student should have a specific and intensive knowledge of whichever one of the following periods of European history, exclusive of the Prologue and Epilogue, he has selected as his period of concentration. Although each student must select one period for concentration, he will also be tested on how well he understands its relation to the general narrative of European history from 1500 to 1945. Under each heading the committee has suggested a list of topics, more as an indication of the scope and intensity desired than as the prescription of an irreducible minimum.

Prologue: the later Middle Ages and the Italian Renaissance to 1500

1. The medieval background: village economy and manorial organization; feudal relations and the structure of feudal monarchies; the universal church; technological changes; commerce and towns; the social hierarchy; intellectual and artistic developments
2. The Renaissance in Italy before 1500: individualism, secularization, humanism, and art

1500-1660

1. The Renaissance in Italy and Northern Europe after 1500
2. The Protestant Reformation and Catholic reform
3. The emergence of the modern state
4. Religious and dynastic wars
5. European discovery and expansion overseas
6. Economic change and the development of mercantilism
7. Continental absolutism and constitutional conflicts in England

1660-1789

1. The continuing growth of mercantilism and capitalistic society
2. Constitutional developments in Great Britain
3. The age of Louis XIV
4. The rise of Prussia and Russia; the consolidation of Austria
5. The scientific revolution, Copernicus to Newton; the Enlightenment
6. The enlightened despots and the bureaucratic state
7. The balance of power in Europe and overseas
8. The *ancien régime* and the background of the French Revolution

1789-1870

1. The French Revolution; Napoleon and the French imperium
2. The age of Metternich
3. The industrial transformation of Europe
4. Romanticism, nationalism, liberalism, and socialism (Utopian and Marxian)
5. The revolutions of 1848
6. Unification movements
7. Political and social developments to 1870
8. Science and thought

1870-1945

1. The new imperialism
2. Changing concepts of the universe, man, society, and the arts
3. The expanding role of government in society
4. The background and results of the First World War; the search for security
5. The Russian Revolution and the rise of communism
6. Fascist regimes
7. Impact of the worldwide depression
8. The background and outcome of the Second World War

Epilogue: Europe from 1945 to 1955

1. The spread of communism and the cold war
2. Reconstruction and cooperation in Western Europe
3. The end of colonial empires
4. Europe and the United Nations

Level of quality

The examination tests the capacity of the student in a variety of respects: his ability to generalize, his ability to interpret, and his ability to analyze and weigh evidence. The committee believes that these are the skills of a well-prepared student, one who can read in a discriminating way and express his ideas with precision and clarity. The ability to express ideas clearly and precisely is especially important. Past examinations have demonstrated that many students have not been adequately trained in the definition and accurate use of the terms they encounter in historical literature.

Approach

The committee hopes to encourage flexibility of approach. Any college-level textbook may well be the basis for a course, but the course will necessarily include other kinds of materials. Some

teachers may want students to read extensively in special studies, biographies, or primary sources. Others may prefer to work intensively with historical problems, documents, or conflicting interpretations. Still others may wish to concentrate for several weeks on special topics, perhaps emphasizing the relation of the material to the humanities or the social sciences. The committee cannot recommend the adoption of any one approach, for experience has shown that different kinds of courses are equally successful in preparing students for the examination.

Examination

The examination is divided into three parts to which the student will devote nearly equal amounts of time. The first part, composed of multiple-choice questions, tests his knowledge of material in the Prologue, in all the four periods from 1500 to 1945, and in the Epilogue from 1945 to 1955. A second part, comprising two essays, enables the student to show his knowledge and understanding of his chosen period of specialization. In a third part, consisting of one longer essay, he is asked to demonstrate a comprehension of major aspects of European history from 1500 to 1945.

Multiple-choice questions

Questions 1 through 12, following, are examples of multiple-choice questions.

1. Which of the following was indispensable to the political aspect of feudalism as it developed in Western Europe in the Middle Ages?
 - (A) The three-field system
 - (B) The concept of divine right of kings
 - (C) Reciprocal personal obligations
 - (D) The concept of chivalry
 - (E) The support of the Church



2. Which of the territories on the map above was acquired by Italy after the First World War?
(A) I (B) II (C) III (D) IV (E) V



I

The Louvre, Paris. Photographie Giraudon



II

Alinari—Art Reference Bureau



III

Reproduced by courtesy of the Trustees,
The National Gallery, London

3. Beginning with the earliest, which is the correct chronological order of the pictures on the opposite page?
(A) I, II, III (B) I, III, II (C) II, I, III
(D) II, III, I (E) III, II, I
4. All of the following contributed to the commercial revolution that took place in Europe between the fourteenth and the seventeenth centuries EXCEPT
(A) the development of the domestic system
(B) a rapid rise in prices
(C) a shift of the center of trade from the Mediterranean to the Atlantic seaboard
(D) the expansion of productive capital
(E) a laissez-faire attitude on the part of governments
5. Which of the following was among the beliefs of Copernicus?
(A) The planets followed circular paths.
(B) The sun revolved around the earth.
(C) To every action there was always an equal reaction.
(D) The Ptolemaic system satisfactorily explained planetary motion.
(E) An infinite universe was held together by the force of gravity.
6. "The aim of all political association is the conservation of the natural and imprescriptible rights of man. These rights are liberty, property, security, and resistance to oppression."
This statement is excerpted from the
(A) Declaration of the Rights of Man and the Citizen
(B) Petition of Right
(C) Bill of Rights
(D) Communist Manifesto
(E) Russian emancipation edict of 1861

Questions 7-10 refer to the following passage.

The first and greatest concern for the immense majority of every nation is the stability of the laws, and their uninterrupted action—never their change. Therefore, let the governments govern, let them maintain the groundwork of their institutions, both ancient and modern; for if it is at all times dangerous to touch them, it certainly would not now, in the general confusion, be wise to do so.

Let them in these troublous times be more than usually cautious in attempting real ameliorations, not imperatively claimed by the needs of the moment, to the end that good itself may not turn against them—which is the case whenever a government seems to be inspired by fear.

Let them be just, but strong; beneficent, but strict.

Let them maintain religious principles in all their purity, and not allow the faith to be attacked and morality interpreted according to the social contract or the visions of foolish sectarians.

Let them suppress secret societies, that gangrene of society.

In short, let the great monarchs strengthen their union, and prove to the world that if it exists, it is beneficent, and ensures the political peace of Europe: that it is powerful only for the maintenance of tranquillity at a time when so many attacks are directed against it; that the principles which they profess are paternal and protective, menacing only the disturbers of public tranquillity.

7. The passage above reflects most closely the views of
- (A) Louis XVI
 - (B) Napoleon I
 - (C) Metternich
 - (D) Palmerston
 - (E) Bismarck

8. The author of the passage appears to be influenced by the ideas of
- (A) Edmund Burke
 - (B) Jeremy Bentham
 - (C) Joseph Mazzini
 - (D) Karl Marx
 - (E) Charles Darwin
9. In urging the governments of Europe to "suppress secret societies, that gangrene of society," the passage seems to be attacking the
- (A) Anti-Corn Law League
 - (B) Empiricists
 - (C) Ultramontanes
 - (D) Carbonari
 - (E) Jesuits
10. Which of the following would most likely support the opinions voiced in the passage?
- (A) The Decembrists
 - (B) The Third Coalition
 - (C) The North German Confederation
 - (D) Young Europe
 - (E) The Holy Alliance
11. Who said that he only wanted to play "the role of an honest broker," and under what circumstances was he speaking?
- (A) Talleyrand at the Congress of Vienna
 - (B) Disraeli in connection with negotiations for shares in the Suez Canal Company
 - (C) Alexander II in reference to his activities in aid of Serbia
 - (D) Bismarck in reference to discussions following the Treaty of San Stefano
 - (E) Sir Edward Grey in attempting to prevent war between Germany and France

12. Which of the following settlements were approved by the peace treaties of 1814–1815?
- I. Russia retained Finland.
 - II. The Austrian Netherlands were annexed to Holland.
 - III. Britain kept Cape Town.
 - IV. Prussia gained land on the left bank of the Rhine.
 - V. Sardinia was enlarged to make it a stronger buffer state.
- (A) I, II, and III only
 - (B) I, IV, and V only
 - (C) II, IV, and V only
 - (D) II, III, IV, and V only
 - (E) I, II, III, IV, and V

Essay questions

Half-hour essay questions such as the following are based on the period of concentration selected by the student. A choice of questions is given in the examination.

1500–1660

13. Why did Luther break with the Church and Erasmus remain within it?
14. How do you account for the shift in the balance of power between Spain and France in the period 1556–1648?

1660–1789

15. By the end of the seventeenth century, the individual became a much smaller object in a much enlarged world and an infinitely enlarged universe. Do you agree with this statement? Illustrate your answer with relevant detail.
16. Why did the regime of Louis XVI fail to solve the problems of France before 1789?

1789-1870

17. What forms did the protests against the character and policies of the Russian government take between 1815 and 1870? Why were these protests ineffective?
18. Between 1815 and 1870 the French changed governments several times. How do you account for the change on any TWO of the following occasions?

1830


1848

1852

1870-1945

19. The totalitarian revolutions of the twentieth century were the direct result of war. Evaluate this statement with reference to TWO of the following:
Communist Russia
Fascist Italy
Nazi Germany
20. Aside from its purely scientific implications, what was the influence of Darwinism on European thought after 1870?

Longer essay questions such as the following are designed to test the student's comprehension of major aspects of European history from 1500 to 1945. A choice of questions is given in the examination.

21. Does a man shape his time or do the conditions of his time shape his destiny? Answer this question for any TWO of the following.
Philip II of Spain
Oliver Cromwell
Napoleon I 
Benito Mussolini

22. "The past has a remarkable power to assert itself. Even the most determined breaks with it have often been followed by a compromise with tradition."

Discuss the validity of this statement with reference to the following.

The English Reformation from 1534 to 1563

The France of Napoleon I

Stalinist Russia

**ANSWER KEY TO MULTIPLE-CHOICE
QUESTIONS, EUROPEAN HISTORY**

1-C, 2-C, 3-D, 4-E, 5-A, 6-A, 7-C, 8-A, 9-D, 10-E,
11-D, 12-E



FRENCH

The Advanced Placement Program in French is intended for highly qualified students in the final stages of their secondary school training. These students should be interested in and capable of completing a course that is comparable in content and in difficulty to a college-level Introduction to French Literature.

The Program consists of: (1) a *course* designed to provide the competent student with a challenging and stimulating context in which to develop his intellectual potential through advanced study of French literature and language, and (2) an *examination* that measures achievement in that course.

In some schools the Program may prove most effective if students are selected on a preliminary basis by the end of the second year and given guidance in special work as early as possible.

Course The primary objective of the course is the development and application of a discriminatory appreciation of the French language and some of its literary expressions. This appreciation includes the following.

- A. Proficiency in the fundamental language skills to a degree that enables the student
 1. To understand what an educated native speaker of French is saying when he speaks at a normal speed and at some length on a subject of a nonspecialized nature
 2. To read with comprehension at sight, prose and verse passages of moderate difficulty and mature content

3. To express in speech and in writing, mature reactions, opinions, and sound critical judgments phrased in correct contemporary French
- B. A knowledge of selected major works representative of the principal genres and major trends and periods in French literature. This knowledge should include an understanding of events in the life of the author or in the period in which he lived or about which he wrote to the extent that is essential to the comprehension of the work involved. Students are not expected to have an extensive knowledge of literary history, nor should the course in any way be understood to be a general survey of French literature.

Reading list The course and the literary portions of the examination are based on the following reading list.

*Villon, selected poems: from *Le Grand Testament*—"Je plains le temps de ma jeunesse . . . Mort saisit sans exception," "Ballade des dames du temps jadis," "Ballade à Notre Dame à la requête de sa mère"; "Ballade des pendus"

Rabelais: *Pantagruel*

Corneille: *Le Cid* or *Polyeucte*

Molière: *Le Misanthrope* or *Tartuffe*

Racine: *Andromaque* or *Phèdre*

*Pascal, selected *Pensées* including the following notions: "L'Esprit de géométrie et l'esprit de finesse," "Les Deux infinis," "Les Puissances trompeuses," "L'Imagination," "L'Amour propre," "Le Pari," "Le Coeur et la raison"

Prévost: *Manon Lescaut*

Voltaire: *Candide*

Rousseau: *Discours sur les sciences et les arts*

*Vigny, selected poems: "Moïse," "Le Cor," "Les Destinées," "La Maison du Berger," "La Mort du Loup," "Le Mont des Oliviers"

*Hugo, selected poems from *Les Contemplations*: "La Vie aux champs," "Elle était déchaussée," "Melancholia," "Elle avait pris ce pli," "Demain dès l'aube," "A Villequier," "Mors," "Paroles sur la dune," "Ce que dit la bouche d'ombre," "A celle qui est restée en France"

*The selections given for these authors represent a minimal list; candidates are strongly encouraged to read others.

*Baudelaire, selected poems: "Préface au lecteur," "L'Albatros," "Elévation," "Correspondances," "La Vie antérieure," "Hymne à la beauté," "Une charogne," "Harmonie du soir," "Invitation au voyage," "La Cloche fêlée," "Spleen" (Quand le ciel . . .), "Le Voyage," "Recueillement"

Balzac: *Le Père Goriot*

Flaubert: *Madame Bovary*

Sartre: *Les Mouches*

Camus: *L'Etranger*

The reading list is panoramic since it encompasses the broad spectrum of French literature from the late Middle Ages to the contemporary period. It is representative of the major genres and authors whose art is universally considered to exemplify the higher forms of expression of French language and thought. The list is selective rather than inclusive in order to ensure similarity of course content and facilitate accurate measurement on the examination.

Except where specific selections have been indicated, the works should normally be read in their entirety. Reading should include both intensive classwork and extensive reading outside of class. It is recommended that part of the student's preparation include frequent question and answer periods, listening comprehension practice, oral content quizzes, and oral and written discussions based on analysis of the situations, emotions, ideas, and implications found in the works. The student should also master the basic terms and techniques of literary analysis of both prose and verse.

Examination

The Advanced Placement Examination in French is three hours in length. Questions may vary in form and type from year to year. The examination is intended to measure the student's competence in the use of language (listening comprehension, reading comprehension, and writing), his knowledge of the works on the reading list, and his ability to apply his skills and knowledge to

*The selections given for this author represent a minimal list; candidates are strongly encouraged to read others.

the interpretation of literary texts. Students are required to write in French. A single score, which is a composite score based on the student's performance in both language and literature, is reported. Students are not permitted to use dictionaries or other reference works during the examination. The examination consists of the following sections.*

Section I

PART A. LISTENING COMPREHENSION

The listening comprehension test is a recorded lecture on a topic of interest on which the students should take notes. The lecture is approximately 12 minutes in length. A series of questions based on the content of the lecture is printed in the examination book; each question is followed by four choices from which the student is expected to select the correct answer.

PART B. READING COMPREHENSION

The student is required to read one or more passages in French and answer multiple-choice questions intended to measure the depth and accuracy of his understanding. The passages are not taken from the works on the reading list but are of comparable sophistication and difficulty. An example of such a text and a few sample questions follow.

De quel droit cette critique s'autorise-t-elle à prononcer un verdict finalement assez redoutable, puisqu'il ne vise à rien de moins qu'à faire naître, ou, au contraire, à écraser presque dans l'oeuf, le fruit de beaucoup de veilles et de quelque ambition. A la vérité,

*A complete examination was published as part of an article on Advanced Placement in the December 1965 issue of the *French Review*. Although some aspects of the examination have been modified (in particular the essay questions of Section III are now usually more tightly related to the reading list and the directions for them are more precise and less ambitious), the published examination is representative of the scope and difficulty of the present forms. A tape of the recorded material from that examination and a reprint of the article are available for \$6 from: College Board Advanced Placement Examination, Box 977, Princeton, New Jersey 08540.

le critique, en tant qu'individu, ne parvient que bien rarement—et c'est fort heureux—à un pareil résultat; mais *la* critique, dans son ensemble—et c'est grave—l'obtient presque toujours.

L'attitude des créateurs à l'égard de ce pouvoir dont ils dépendent plus qu'ils ne veulent l'avouer, est souvent contradictoire: lorsque la critique les encense, ils en font le plus grand cas—et quand elle les gronde, ils affectent de la mépriser. Ce point de vue trop compréhensible ne prouve évidemment rien. L'honnête homme qui n'est ni juge, ni partie, mais seulement, si j'ose ainsi parler, consommateur, a plus de titres à demander des comptes. Il aimerait savoir, au nom de quoi on lui commande ou lui gâte son plaisir, comme d'ailleurs son déplaisir. La critique est-elle un art, une science, une technique? Elle est un peu tout cela à la fois, et plus ou moins selon les cas. Étrange art qui à besoin d'un autre, préalable, pour faire son miel, mais art incontestable si l'on prend seulement la peine de lire une page de Sainte-Beuve ou de Thibaudet. Science incertaine à coup sûr, qui repose sur des bases toujours remises en question, mais science, cependant, puisqu'elle vise, et parfois réussit, non à dégager les lois du beau (c'est le domaine de l'esthétique), mais à éclairer, en allant du particulier au général, puis du général au particulier, les processus de la création. Technique douteuse, parfois, quand l'humeur ou la brigue viennent en fausser les règles, d'ailleurs mal codifiées; mais technique en ce qu'elle réclame un long apprentissage et ce "flair" que connaît seul l'homme de métier.

1. Dans ce passage, l'auteur
 - (A) se plaint de la sévérité excessive de toute critique
 - (B) prend le parti des auteurs contre les critiques
 - (C) soumet à l'examen les bases de la critique
 - (D) considère que la critique est trop technique pour être codifiée

2. L'auteur pense que la critique
- (A) prétend décider de la vie ou de la mort d'une oeuvre
 - (B) ne joue pas un rôle très décisif dans la vie d'une oeuvre
 - (C) ne veut guère faire naître le fruit de quelque ambition
 - (D) cherche moins à faire naître une oeuvre qu'à l'écraser dans l'oeuf
3. La critique est un art qui
- (A) n'est peut-être pas un art véritable
 - (B) est plus technique que les autres arts
 - (C) présuppose l'existence d'autres arts dont il dépend
 - (D) existe surtout pour adoucir l'existence

Section II

This section consists of a series of multiple-choice questions designed to measure the student's knowledge and understanding of the works on the reading list; each question is followed by four choices from which the student is to select the correct answer.

4. Villon et Baudelaire se ressemblent quelquefois à cause de leurs
- (A) souvenirs sereins et nostalgiques
 - (B) traits saillants et réalistes
 - (C) allusions mythologiques
 - (D) sentiments d'indifférence vis à vis de la mort
5. Une des qualités remarquables des contes philosophiques de Voltaire, c'est
- (A) l'in vraisemblance voulue de l'intrigue
 - (B) la peinture recherchée des personnages
 - (C) la sauté musicale du style
 - (D) la description abondante de la nature

6. Dans le *Cid* et *Polyeucte* de Corneille l'amour est une passion qui
(A) écrase aveuglément ses victimes
(B) est strictement gouvernée par la raison
(C) est souvent un attachement légitime, mais subordonnée à d'autres obligations
(D) est sans valeur positive dans le code d'honneur cornélien
7. Les poésies de Vigny sont quelquefois développées d'une façon
(A) mystique
(B) classique
(C) symbolique
(D) lyrique
8. Lorsque Pascal parle de la misère de l'homme, l'image centrale s'emprunte
(A) aux sciences biologiques
(B) à la géographie
(C) à la médecine
(D) aux sciences optiques

Section III

PART A. ESSAY

The student is required to write in French on *one* of a series of literary topics. He is expected to make specific references to his readings and to limit his essay to the scope and intent of the topic.

- A-1. Les héroïnes du *Cid* et d'*Andromaque* (Chimène, Andromaque et Hermione). Comparez leur caractère, leur rôle dans chaque pièce et leur attitude envers l'amour.
- A-2. Par quels moyens Voltaire arrive-t-il à unifier les aventures disparates de *Candide*?

- A-3. Quelle est l'attitude de Flaubert en face de l'héroïne de *Madame Bovary*, et comment l'exprime-t-il?

PART B. LITERARY INTERPRETATION

The student is asked to read several short passages from the works on the reading list and answer in French the questions following them. His answers should be brief and relevant and should take into account the relative importance attached to each question as indicated by the percentages in parentheses.

- B-1. *Andromaque*
- Pyrrhus: Hé bien, Madame, hé bien, il faut vous obéir:
Il faut vous oublier, ou plutôt vous haïr.
Oui, mes vœux ont trop loin poussé leur violence
Pour ne plus s'arrêter que dans l'indifférence.
- (5) Songez-y bien: il faut désormais que mon cœur
S'il n'aime avec transport, hâisse avec fureur.
Je n'épargnerai rien dans ma juste colère:
Le fils me répondra des mépris de la mère;
La Grèce le demande, et je ne prétends pas
- (10) Mettre toujours ma gloire à sauver des ingrats.
- (20%) 1. Expliquez la situation dans laquelle Pyrrhus prononce ces paroles.
- (40%) 2. Qu'est-ce que le langage de Pyrrhus nous apprend sur son caractère?
- (40%) 3. Quelles seront les réponses d'Andromaque à cet ultimatum?

B-2. *Discours sur les sciences et les arts*

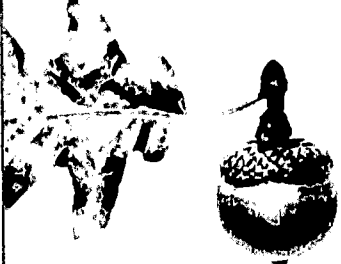
Voilà comment le luxe, la dissolution et l'esclavage ont été de tout temps le châtiment des efforts orgueilleux que nous avons faits pour sortir de l'heureuse ignorance où la sagesse éternelle nous avait placés. Le voile épais dont elle a couvert

- (5) toutes ses opérations semblaient nous avertir assez qu'elle ne nous a point destinés à de vaines recherches. Mais est-il quelque'une de ses leçons dont nous ayons su profiter, ou que nous ayons négligée impunément? Peuples, sachez donc une fois que la nature a voulu vous préserver de la
- (10) science, comme une mère arrache une arme dangereuse des mains de son enfant; que tous les secrets qu'elle vous cache sont autant de maux dont elle vous garantit, et que la peine que vous trouvez à vous instruire n'est pas le moindre de ses bienfaits. Les hommes sont pervers; ils seraient pires
- (15) encore s'ils avaient eu le malheur de naître savants.
- (30%) 4. Quels sont, selon Rousseau, les dangers de la science?
- (40%) 5. Quel rapport pouvez-vous établir entre la "sagesse éternelle" (ligne 3-4) et la "nature" (ligne 9)?
- (30%) 6. En vous basant sur les idées exposées dans ce passage, expliquez l'opinion qu'a Rousseau de l'homme en général.

**ANSWER KEY TO MULTIPLE-CHOICE
QUESTIONS, FRENCH**

1-C, 2-A, 3-C, 4-B, 5-A, 6-C, 7-C, 8-D

GERMAN



A German course leading to advanced placement should encourage superior students to achieve a high degree of competence in the language skills—understanding, speaking, reading, and writing German—and to develop their ability to read and interpret German literature.

A four-year sequence is generally required to achieve the aims set forth in this course description, but a number of variations are possible. For example: (1) Advanced Placement students may receive special training within or outside the regular fourth-year course; (2) superior students may be permitted to bypass one or two semesters, thus reaching the fourth-year course after only two or two and a half years of study; (3) if more than two sections of second- and third-year German exist, a special section may be established for superior students to cover the work of second- and third-year German in one year; or (4) where no provisions can be made for a fourth-year course, outstanding students may be prepared for the Advanced Placement Examination by special tutorial work.

As longer sequences of language classes, beginning in junior high school, are established, more and more Advanced Placement candidates will be trained in regular fourth- or fifth-year courses. It should be borne in mind, however, that an Advanced Placement course can only be as good as the foundation on which it rests. The Committee of Examiners for German feels very strongly that any school embarking upon an Advanced Placement program in German should thoroughly examine the content of its basic courses. Academic excellence should be the

main goal, even in beginning German classes; high achievement in an introductory literature course is possible only when there has been high achievement in the acquisition of language skills. Within a strong four-year sequence, work toward the German Advanced Placement Examination can well begin in the eleventh grade.

The German Advanced Placement course description stresses a balance of linguistic and literary achievement, based on the assumption that language work beyond the acquisition of basic skills has a rightful place beside literary analysis as "college-level work." The examination will clearly reflect this conviction. Candidates should have the linguistic training equivalent to the first two years of a strong college German course and the experience of applying this linguistic achievement to the work done in a third-year introduction-to-literature course. Candidates are not expected to have the training equivalent to a third-year college course in composition and conversation.

The September 1965 issue of *The German Quarterly* was devoted entirely to Advanced Placement; it contains articles by college and high school teachers, as well as a complete reprint of an Advanced Placement Examination including the script for the tape-recorded parts of the examination.*

Course Ideally the preparation of Advanced Placement students should begin in the first-year course in order to achieve the highest possible degree of language proficiency. By the time they start their last year of German in secondary school, candidates should be able (1) to understand German spoken in connected discourse or in simple lectures at normal speed; (2) to express themselves in idiomatic German on everyday conversational topics as well as on general literary themes; (3) to read German literary works of moderate difficulty; and (4) to write simple German with reasonable ease and accuracy.

*The tape recording can be purchased for \$6. Address your orders, accompanied by payment, to College Board Advanced Placement Examinations, Box 977, Princeton, N.J. 08540.

Beyond the acquisition of these basic skills, Advanced Placement candidates should develop an increasing familiarity with the German language as a mode of expression distinctly different from English, and a capacity for literary interpretation and critical analysis of representative works by major German authors. Both of these aims can be achieved by reading works suggested in the two lists below.

Reading lists

The authors represented in these reading lists range chronologically from Lessing to contemporary writers such as Böll and Grass. Under no circumstances, however, should an Advanced Placement course represent a survey of German literary history, nor should it unduly stress the authors' biographies. The starting point for any interpretation should be the language of the work itself, leading to a discussion of style, imagery, symbolism, techniques, and aesthetic qualities. Students should then go on to consider the historical background and the moral, philosophical, and social issues that may be involved.

Reading only for comprehension and factual information is typical of most third-year courses. However, some of the techniques suggested for the Advanced Placement course, for example, identification of stylistic features characteristic of an author or a period, comparison of poems or of prose passages, or discussion of narrative techniques, can be used as early as the third year of study. Close coordination and cooperation with the English department often prove very valuable in introducing such techniques. A number of the works listed below can easily be read in a third-year course. The following works must be read in preparation for the examination:

Goethe, selected poems, *Urfaust*
Schiller, selected ballads, *Maria Stuart*
Kleist, *Prinz Friedrich von Homburg*
Heine, selected poems
Keller, *Kleider machen Leute*

Mann, *Tonio Kröger*
Rilke, selected poems
Kafka, *Ein Hungerkünstler, Das Urteil*

The committee does not consider these to be the most outstanding works of German literature, but they are works of indubitable importance that are commensurate with the candidates' age level and linguistic capacities in German. These works need not be read in chronological order; in fact, it may be pedagogically sounder to proceed from the easier reading to the more difficult reading.

In addition, reading in breadth should be developed through selected works from the list below that includes further works by the above authors as well as those of other writers. At least *four* authors from the list below should be covered; the titles, however, are merely suggestions and are intended to be guidelines rather than directives. The works in this second list will not be tested specifically. Candidates will be required to demonstrate what they are able to do as a result of their reading experience rather than merely what they have done with works they have studied in class. In selecting works for supplementary reading, teachers should make sure that the works chosen represent a variety of genres, styles, and historical periods. The committee also strongly recommends the use of an anthology of poetry.

Lessing, *Minna von Barnhelm, Nathan der Weise, or Emilia Galotti*
Goethe, *Egmont or Die Leiden des jungen Werther*
Schiller, *Die Jungfrau von Orleans, or Wilhelm Tell**
Kleist, *Michael Kohlhaas, or Das Erdbeben in Chili*
Tieck, *Der blonde Eckbert**
Eichendorff, *Aus dem Leben eines Taugenichts,** selected poems
E. T. A. Hoffmann, *Der goldene Topf, or Das Fräulein von Scuderi*
Chamisso, *Peter Schlemihl**
Heine, *Die Harzreise*

*Suitable for reading as early as the third year.

Stifter, *Bergkristall*,* or *Brigitta*
 Keller, *Romeo und Julia auf dem Dorfe*,* or *Die drei gerechten Kammacher**
 Mörike, *Mozart auf der Reise nach Prag*
 Grillparzer, *Der arme Spielmann*, or *Sappho*
 Hebbel, *Maria Magdalena*
 Meyer, *Der Heilige*, or *Gustav Adolfs Page**
 Storm, *Immensee*,* *Aquis Submersus*, or *Der Schimmelreiter*
 Fontane, *Irrungen Wirrungen*
 Hauptmann, *Bahnwärter Thiel*, or *Einsame Menschen*
 Schnitzler, *Der grüne Kakadu*, *Leutnant Gustl*, or *Der blinde Geronimo**
 Hofmannsthal, selected poems, *Der Tor und der Tod*
 Mann, *Tristan* or *Mario und der Zauberer*
 Hesse, *Knulp*,* or *Siddharta*
 Kafka, *Die Verwandlung*
 Rilke, *Die Weise von Liebe und Tod des Cornet Christoph Rilke*
 Brecht, *Der gute Mensch von Sezuan*, *Mutter Courage*, or *Galileo*
 Borchert, *Draussen vor der Tür**
 Dürrenmatt, *Der Besuch der alten Dame*, or *Der Richter und sein Henker**
 Frisch, *Biedermann und die Brandstifter*, or *Andorra*
 Contemporary short stories and *Hörspiele* by authors such as Aichinger,
 Bachmann, Böll, Eich, Grass, Lenz, and Schnurre

The number of pages read is not a decisive factor. Close reading and detailed analysis of short works—for example, Kafka's *Vor dem Gesetz*—can be excellent preparation for comprehensive reading of longer works.

The works contained in the first list can easily be read in any regular fourth-year secondary school course. When there is no provision for a special advanced section of fourth-year German, the Advanced Placement candidates in the regular course may be given the reading from the second list as special work in addition to the basic reading from the first list.

The special issue of *The German Quarterly* mentioned above contains a bibliography of available texts and of secondary sources useful to the Advanced Placement teacher.

*Suitable for reading as early as the third year.

Examination

The examination is designed to test the student's linguistic competence and his capacity for literary interpretation and critical judgment. In terms of literary content, the level of the examination is comparable to the level of examinations given in colleges and universities after third-year introductory literature courses. The language proficiency required for participation in such a course is tested explicitly and implicitly as it is applied to literary topics. The required level of language achievement is intended to be comparable to the outcome of a second-year college-level course in German, not to a third-year course in composition and conversation. Consequently, the candidate is permitted to write certain parts of the examination where subtle insights and complex thoughts need to be communicated either in German or in English, whichever enables him to express himself most effectively. In other parts of the examination, however, the candidate is required to answer in German. Students will be tested on their knowledge of the works in the first list, on their familiarity with some works from the second list (or similar works), and on their ability to discuss comparable literary material with which they are presumably not familiar.

Basic changes in the examination will not be made without appropriate prior announcement. The questions outlined below give an indication of a typical examination; future examinations will, of course, vary in detail.

Listening comprehension

The candidate may hear a series of short conversations and be asked to select, from among four printed choices, the response that most appropriately continues the conversation.

For instance, the candidate may hear:

"Du, Ernst, der Gustav hat schon wieder ein Buch von uns mitgenommen, ohne vorher zu fragen."

"Ich sage ja, der weiß nicht, was sich gehört."

In his examination book, the candidate reads the four choices that follow and selects the appropriate response.

(A) Hat er ihn denn wenigstens gefragt?

(B) Wir hätten ihn nicht mitnehmen sollen.

(C) Ich hoffe nur, er bringt es wieder.

(D) Von wem hat er es denn gehört?

Obviously, the correct response is (C). Other questions of this type may refer to general literary or cultural topics.

The candidate may be asked to listen to and take notes on a brief recorded lecture on a literary or cultural topic and then demonstrate his understanding by answering a number of printed multiple-choice questions. Topics discussed in past examinations include: Deutsche Klassik und Romantik; Der Dichter und die Politik; Eichendorff und Heine; Die Rolle der Zeitung in Deutschland; Das deutsche Theater.

The candidate may be asked to write suitable responses to tape-recorded conversational statements. (In the absence of a speaking test, this technique comes closest to testing the candidate's speaking ability.) Each spoken sentence is followed by a pause of 35 seconds during which the candidate writes his response. He may use either phrases or complete sentences in his answers, whichever he finds more suitable.

He may, for example, be told "Zwei amerikanische Jungen sitzen am Radioapparat und hören ein Programm aus Deutschland." If he then hears the remark: "Mensch, die sprechen aber schnell!" he might reply: "Ja, die Deutschen sprechen immer schnell." Or he might answer: "Das finde ich gar nicht; ich konnte jedes Wort verstehen."

Some of these conversational stimuli may also refer to literary topics. If, for example, the statement is made: "Ich finde, daß Kafkas Geschichten furchtbar schwer zu verstehen sind," the candidate might reply: "Gerade das macht Kafka so interessant." A more sophisticated answer might be: "Das kommt daher, daß sein Stil so einfach ist und seine Symbolik so kompliziert."

Writing

Candidates may be asked to write a short composition in German on an assigned topic. For example, candidates may be asked to read a brief prose passage or poem and to comment in German on certain aspects, such as content and form.

Literary interpretation

Candidates may be asked to answer a number of multiple-choice questions based on the works and authors from the first reading list above. For example:

1. Nettchen sagte gerührt: "Ach, das Nationale ist immer so schön!," weil Strapinski
 - (A) viele Jahre in Polen verbracht hatte
 - (B) das polnische Lied ins Deutsche übersetzt hatte
 - (C) soeben ein Volkslied auf polnisch gesungen hatte
 - (D) auch Schweizer geworden war

2. "Hier traf er, da bald darauf ihre erschrockenen Frauen erschienen, Anstalten, einen Arzt zu rufen, versicherte, indem er sich den Hut aufsetzte, daß sie sich bald erholen würde, und kehrte in den Kampf zurück." Dem Stil nach zu urteilen, stammt dieser Satz von
 - (A) Kafka
 - (B) Keller
 - (C) Mann
 - (D) Kleist

3. Kafkas "Urteil" behandelt einen Konflikt zwischen
- (A) Dichter und Bürger
 - (B) Traum und Wirklichkeit
 - (C) Vater und Sohn
 - (D) Einst und Jetzt

Candidates may also be asked to answer essay questions on poems or prose passages from works by the authors on the first list. These questions may be answered in English or in German, but candidates are not given special consideration for answering in German. For example, candidates may be given the following passage from Keller's *Kleider machen Leute*.

Er stürzte vor ihr nieder und rief: "Verzeih mir! Verzeih mir!" "Komm, fremder Mensch," sagte sie mit unterdrückter zitternder Stimme, "ich werde mit dir sprechen und dich fortschaffen." Sie winkte ihm, in den Schlitten zu steigen, was er folgsam tat; sie gab ihm Mütze und Handschuh, ergriff Zügel und Peitsche und fuhr vorwärts.

Nettchen rief: "Keine Romane mehr! Wie du bist, ein armer Wandersmann, will ich mich zu dir bekennen und in meiner Heimat dein Weib sein." Und wie gesagt, so getan! Sie fuhren ihres Weges weiter. Wenzel führte jetzt die Zügel. Nettchen lehnte sich so zufrieden an ihn, als ob er eine Kirchensäule wäre.

4. These two passages precede and follow the turning point of the story. How does the language of these passages reflect the changes that have taken place?

So that the candidates can demonstrate their ability to read German acquired in the Advanced Placement course, they may be asked to read one or two poems or prose passages by authors with whose works they are presumably not familiar and to answer questions about them, in German or in English. For example:

September

Herbst will es werden allerwärts.
Ob Astern auch und Georginen¹
Im Garten glühn mit Freudemienen,
Sie tragen doch geheimen Schmerz.

Die Abendberge träumen nun
So gold und rot am blauen Bande,
Als wär es rings im weiten Lande
Um lauter Glanz und Lust zu tun.

Auch meine Träume schmücken sich
Und summen liebe Jugendweisen²
Und tun bekränzte Heimatreisen
Und blicken still und feierlich.

Und dennoch weiß mein tiefster Sinn:
Von meines Lebens Sonnehzeiten
Ist wieder eine im Entgleiten
Und heute, morgen schon dahin.

¹ *Astern, Georginen*: names of flowers

² *Weisen*: melodies

Jugend und Liebe

Die Jugend folgt, ein Rosenblatt, den Winden;
Wenn, jung getrennt, sich wiedersehn die Alten,
Sie meinen doch, in ihren ernsten Falten
Den Strahl der süßen Jugend noch zu finden.

Des Dauerns Wahn,³ wer läßt ihn gerne schwinden?
Mag auch ein Herz, das uns geliebt, erkalten,
Wir suchen immer noch den Traum zu halten,
Nur stiller sei geworden sein Empfinden.

³ *Wahn*: delusion

Die Jugend folgt, ein Rosenblatt, den Lüften;
Noch leichter als die Jugend flieht die Liebe,
Die nur des Blattes wonnereiches Düften.

Und dennoch an den herben Tod des Schönen,
Im treuen Wahn, als ob es ihm noch bliebe,
Kann sich das Herz auch sterbend nicht gewöhnen.

5. The central theme of these poems is the experience of transitoriness. Trace the development of this theme in each poem with specific references to the images of *Traum* and *Jugend*.
6. In each poem, the turning point is introduced in the fourth stanza by the words *und dennoch*. Show how their conclusions differ.

Candidates may also be asked to write an essay on a given topic, in English or in German, whichever permits them to express themselves more clearly. (They are given no special consideration for answers written in German, however.) They will be asked to relate the theme to one or more of the works from the supplementary list. An example of such a topic might be: In many works of German literature the love of one human being for another stands in a relationship of complication, conflict, or irreconcilability with other issues or goals. Show how this tension operates in at least two of the works you have read.

ANSWER KEY TO MULTIPLE-CHOICE QUESTIONS, GERMAN

1-C, 2-D, 3-C



LATIN

The aims of the four Advanced Placement Latin courses—Vergil, Comedy, Lyric, Prose—are in general conformity with those of corresponding courses taught in American colleges and universities. As in all courses in Latin beyond the elementary level, the basic objective is progress in the ability to read, understand, and interpret Latin literature in the original language. The advanced secondary school student should attain a level of proficiency comparable to that of the college student who has successfully pursued a similar course.

The appreciation of Latin literature calls for an understanding of how Latin writers obtained their effects. Accordingly, a stylistic analysis is an integral part of the advanced work in any of the courses described here.

Advanced Placement courses should also include some study of Roman life as revealed in Roman literature and the cultivation of an awareness of classical influence upon later literature.

There is an appropriate Advanced Placement Examination for each course. Each examination is an hour and a half in length, and a candidate may elect to take any single examination or combination of two examinations in a given year.

The contents of these examinations are rather specifically stated as an aid to teachers in planning the courses and preparing students for the examination. The authors and works selected for emphasis here are among those most frequently read. While it is recognized that there is considerable variation in the reading included in comparable college courses, each is equated with approximately one semester's college work. It is noted,

however, that there is variance in the amount of time allotted to the reading of the *Aeneid* in college curriculums where, in many instances, it is taught in a full year program.

VERGIL

Course The reading in Latin of Books I, II, IV, VI, and either Book III, V, or XII of the *Aeneid* is required. A knowledge of the contents of the remaining books is expected. Appreciation of the *Aeneid* as poetry includes the ability to read aloud, with attention to pauses and phrasing, and to scan Latin hexameter verse. Scansion includes marking the quantity of syllables, division into feet, and indication of elision. The student should be given extensive practice in reading at sight. Study of the ancient epic (especially *The Iliad* and *The Odyssey*) as a literary genre and some acquaintance with Roman social, political, and literary history are assumed. The amount of time devoted to the Vergil course is flexible and will in part depend on such factors as the extent and character of the group's prior training, its general ability, and the teacher's own background and inclinations.

Examination The hour-and-a-half examination will include both multiple-choice questions and questions for which the student writes his own responses. Students may be tested on sight passages for comprehension or translation, familiar passages for detailed criticism or interpretation, and background information. Translations should be as accurate as is consistent with idiomatic English. The exact content and form of the examination will vary from year to year.

The following are sample questions and do not constitute a 90-minute examination. The answer key to the multiple-choice questions is on page 145.

Questions 1-11

Suggested time—15 minutes

Read the following passage carefully for comprehension and then select the best answer or completion to each of the related questions and incomplete statements.

At iuveni oranti subitus tremor occupat artus,
deriguere oculi: tot Erinys sibilat hydris
tantaque se facies aperit; tum flamma torquens
lumina cunctantem et quaerentem dicere plura

- (5) reppulit, et geminos erexit crinibus anguis,
verberaque insonuit rabidoque haec addidit ore:
“En ego victa situ, quam veri effeta senectus
arma inter regum falsa formidine ludit;
respice ad haec: adsum, dirarum ad sede sororum,
(10) bella manu letumque gero.”

—Aeneid 7.446–455

1. The name of the *iuveni* (line 1) is
 - (A) Aeneas
 - (B) Turnus
 - (C) Pallas
 - (D) Triciani

2. *deriguere* (line 2) is
 - (A) a present infinitive
 - (B) present tense, passive voice
 - (C) future tense, passive voice
 - (D) perfect tense, active voice

3. *Erinys* (line 2) is
 - (A) an adjective modifying *hydris*
 - (B) a noun, nominative plural, modified by *tot*
 - (C) a noun, nominative singular, subject of *sibilat*
 - (D) a noun, genitive singular, modifying *hydris*

4. *-que* (line 3) properly connects
(A) *tanta* and *facies*
(B) *tot* and *tanta*
(C) *Erinys* and *facies*
(D) *sibilat* and *aperit*
5. *quaerentem dicere plura reppulit* (lines 4–5) is best translated
(A) while he was trying to say more, she pushed him back
(B) he wanted to speak, but more things stopped him
(C) he was complaining, so she stopped him from saying more
(D) to have spoken further would have repelled his request
6. *verberaque insonuit* (line 6) is best translated
(A) her words re-echoed
(B) she shouted aloud
(C) she cracked her whip
(D) her words were innocent
7. *veri* (line 7) is
(A) ablative singular, modified by *effeta*
(B) first person singular, perfect indicative active, of *verto*
(C) passive infinitive of *vereor*
(D) genitive singular with *effeta*
8. Who speaks lines 7–10?
(A) Juno
(B) Allecto
(C) Amata
(D) Beroe
9. The subject of these lines is best described as
(A) an apparition
(B) death
(C) old age
(D) fear

10. What characteristic of Erinys is NOT described?
(A) Hair
(B) Voice
(C) Walk
(D) Glance
11. Which of the following lines begins with three dactyls?
(A) 3
(B) 5
(C) 7
(D) 9

Questions 12-21

Suggested time—50 minutes

Read but do NOT translate the following familiar passage from the *Aeneid* with a view to answering the questions that follow.

Quaerenti et tectis urbis sine fine ruenti
infelix simulacrum atque ipsius umbra Creusae
visa mihi ante oculos et nota maior imago.
Obstipui, steteruntque comae et vox faucibus haesit.

- (5) Tum sic adfari et curas his demere dictis:
"Quid tantum insano iuvat indulgere dolori,
o dulcis coniunx? Non haec sine numine divum
eveniunt; nec te hinc comitem asportare Creusam
fas, aut ille sinit superi regnator Olympi.
- (10) Longa tibi exsilia et vastum maris aequor arandum,
et terram Hesperiam venies, ubi Lydius arva
inter opima virum leni fluit agmine Thybris:
illic res laetae regnumque et regia coniunx
parta tibi; lacrimas dilectae pelle Creusae.
- (15) Non ego Myrmidonum sedes Dolopumve superbas
aspiciam aut Graeis servitum maribus ibo,
Dardanis et divae Veneris nurus;

sed me magna deum genetrix his detinet oris.
Iamque vale et nati serva communis amorem.”

(20) Haec ubi dicta dedit, lacrimantem et multa volentem
dicere deseruit, tenuesque recessit in auras.
Ter conatus ibi collo dare bracchia circum;
ter frustra compressa manus effugit imago,
par levibus ventis volucrique simillima somno.

Answer in one or two sentences.

12. Name and account for the case of *nota* in line 3.
13. Identify and account for the form of *adfari* in line 5.
14. Give two other instances in which Aeneas has been shown that his actions and fate through this night have been governed *numine divum* (line 7).
15. Account for the epithet *Lydius* in line 11.
16. Identify *regia coniunx* in line 13.
17. Who are the *Myrmidonum* in line 15?
18. In the *Aeneid* who did suffer the fate referred to in line 16?
19. In what situation in the *Aeneid* are lines 22–24 echoed?
20. What is the meter in which the *Aeneid* is written? Copy and scan the following lines.

ubi Lydius arva
inter opima virum leni fluit agmine Thybris:
illic res laetae regnumque et regia coniunx
parta tibi;

How does the rhythm here reinforce the sense of the lines?

21. In this passage, the emotions of the audience are manipulated in Aeneas' favor. Making specific reference to the Latin above, briefly explain three instances where this is done.

Question 22

Suggested time—40 minutes

22. Translate the following passage.

Turnus is trapped in the Trojan camp.

Turnus paulatim excedere pugna
et fluvium petere ac partem quae cingitur unda.
Acrius hoc Teucri clamore incumbere magno
et glomerare manum, ceu saevum turba leonem
cum telis premit infensis: at territus ille,
asper, acerba tuens, retro redit et neque terga
ira dare aut virtus patitur, nec tendere contra
ille quidem hoc cupiens potis est per tela virosque.
Haud aliter retro dubius vestigia Turnus
improperata refert et mens exaestuat ira.
Quin etiam bis tum medios invaserat hostes,
bis confusa fuga per muros agmina vertit;

Question 23

Suggested time—20 minutes

23. Write a brief essay in answer to the question "Why did Vergil intend the second half of the *Aeneid* to be a 'maius opus'?"

. . . maior rerum mihi nascitur ordo,
maius opus moveo.

—Bk. vii. 44–45

COMEDY

Course This course should take about a semester if done as a major course, or it could be taught as a minor course extending over a full year. At least two Roman comedies are to be read in Latin, one each of Plautus and Terence, chosen from the following: Plautus—*Menaechmi*, *Mostellaria*; Terence—*Adelphoe*, *Andria*. It is assumed, for examination purposes, that the student will have read the remaining two in English. The student should also be familiar with Roman stage conventions. It is important that the student receive extensive practice in reading at sight.

Examination The hour-and-a-half examination will include both multiple-choice questions and questions for which the student writes his own responses. Students may be tested on sight passages for comprehension or translation, familiar passages for detailed criticism or interpretation, and background information. Translations should be as accurate as is consistent with idiomatic English. The exact content and form of the examination will vary from year to year.

The following are sample questions and do not constitute a 90-minute examination. The answer key to the multiple-choice questions is on page 145.

Questions 1-10

Suggested time—15 minutes

Read the following passage* carefully and then select the best completion to each of the related incomplete statements.

THEOPROPIDES. Qua in regione istas aedis emit filius?

TRANIO. Ecce autem perii! THEO. Dicitne hoc quod te rogo?

TRAN. Dicam. Sed nomen domini quaero quid siet.

*This selection is given for illustrative purposes. Ordinarily, the objective section of this examination will be based on a passage done at sight.

THEO. Age comminiscere ergo. TRAN. Quid ego nunc agam
nisi ut in vicinum hunc proximum rem conferam?
Eas emisse aedis huius dicam filium?

—Plautus, *Mostellaria* 659–664

1. The word *aedis* (line 1) is
 - (A) nominative case, singular
 - (B) genitive case, singular
 - (C) nominative case, plural
 - (D) accusative case, plural

2. The name of the *filius* (line 1) is
 - (A) Callidamates
 - (B) Philolaches
 - (C) Grumio
 - (D) Simio

3. The sentence *Ecce autem perii* (line 2) is best translated
 - (A) I've had it!
 - (B) Watch it, or I'll finish you!
 - (C) I've got it!
 - (D) Watch how I'll destroy him!

4. The sentence *Dicisne . . . rogo* (line 2) is best translated
 - (A) Are you saying this because I want you to?
 - (B) I wonder whether you are speaking or not?
 - (C) Are you answering my question?
 - (D) Shall I ask after you say this?

5. Tranio is stalling in *Dicam . . . siet* (line 3) because he
 - (A) has not been told the name
 - (B) does not want to give the name away
 - (C) has not yet thought of a name
 - (D) knows that the name will irritate Theopropides

6. *siet* (line 3) in prose of the classical period would be written
(A) *esset*
(B) *sit*
(C) *est*
(D) *erit*
7. *comminiscere* (line 4) is
(A) indicative
(B) subjunctive
(C) infinitive
(D) imperative
8. The words *rem conferam* (line 5) are best translated
(A) I carry my business to
(B) I pay attention to
(C) I push it off to
(D) I speak to
9. Tranio's lines *Quid . . . filium* (lines 4–6) are
(A) spoken directly to Theopropides
(B) not meant to be overheard by Theopropides
(C) meant to be overheard by Theopropides
(D) are spoken to a third party who is present during the whole scene
10. *huius* (line 6) refers to the
(A) son
(B) neighbor
(C) father
(D) property

Question 11

Suggested time—35 minutes

11. Translate the following passage into suitable English.

A soliloquy by Curculio

Antiquom poetam audivi scripsisse in tragoedia
mulieres duas peiores esse quam unam. Res itast.
Verum mulierem peiorem quam haec amica est Phaedromi
non vidi neque audivi, neque pol dici nec fingi potest
peior: quae ubi me hunc habere conspicatast anulum¹
rogat unde habeam. "Quid id tu quaeris?" "Quia mi quaesitost
opus."

Nego me dicere. Ut eum eriperet, manum arripuit mordicus.²
Vix foras me abripui atque ecfugi. Apage istanc caniculam!

—Plautus, *Curculio* 591–598

¹ *anulus*: ring

² *mordicus*: in her teeth

Question 12

Suggested time—20 minutes

12. Discuss what is typical of Roman comedy in the situation described by the speakers in the passage you have just translated.

Questions 13-18

Suggested time—25 minutes

Read, but do NOT translate the following passages, and answer briefly the questions given below each passage.

MEDICUS: Quid esse illi morbi dixerat? Narra, senex.

Num larvatust aut cerritus? Fac sciam.

Num eum veterus aut aqua intercus tenet?

SENEX: Quin ea te caussa duco ut id dicas mihi

(5) atque illum ut sanum facias. MED. Perfacile id quidemst.

Sanum futurum, mea ego id promitto fide.

SE. Magna cum cura ego illum curari volo.

MED. Quin suspirabo plus sescentos in dies:

ita ego eum cum cura magna curabo tibi.

13. Give the author and Latin name of the play from which this scene is taken.
14. Translate *Fac sciam* (line 2).
15. Why does the *senex* ask the *medicus* for help?

DEMEA: vidistin hodie? SYRUS: Tuomne filium?
 abigam hunc rus. Iamdudum aliquid ruri agere arbitror.
 DE. Satin scis ibi esse? SY. Oh, qui egomet produxi.

DE. Optumest.

Metui ne haereret hic. SY. Atque iratum admodum.

(5) DE. Quid autem? SY. Adortust iurgio fratrem apud forum
 de psaltria ista. DE. Ain vero? SY. Vah nil reticuit;
 nam ut numerabatur forte argentum, intervenit
 homo de improvise: coepit clamare "O Aeschine,
 haecin flagitia facere te! Haec te admittere

(10) indigna genere nostro!" DE. Oh, lacrumo gaudio!

16. Give the author and Latin name of the play from which this scene is taken.
17. What character types are represented by Demea and Syrus?
18. What immediate situation underlies the humor of this scene?

LYRIC

Course This course should take about a semester if done as a major course, or it may be taught as a minor course extending over a full year. A substantial amount of the lyric poetry of Catullus and Horace should be read with emphasis on appreciation, critical analysis, and translation of the lyric genre. For examination purposes it is assumed that the following poems have been read in Latin and are familiar to the student.

Catullus (as numbered in Mynors' Oxford Classical Text): 1, 2, 3, 4, 5, 7, 8, 9, 11, 13, 17, 27, 29, 31, 34, 38, 45, 46, 49, 50, 51, 63, 70, 72, 73, 75, 76, 84, 85, 86, 87, 92, 93, 96, 101, 109.

Horace, *Odes*: Book I, 1, 4, 5, 9, 11, 21, 22, 23, 24, 34, 37, 38; Book II, 3, 10, 13, 14, 16; Book III, 1, 3, 4, 5, 6, 9, 13, 26, 30; Book IV, 7.

Scansion of the following meters is expected: the Alcaic and Sapphic strophes; the elegiac distich; iambic (pure iambic, scazon "choliambic," and trimeter), hendecasyllabic, Asclepiadean, Pherecratic, and Glyconic lines. Scansion includes indication of elision, marking the true quantities of the syllables (the natural quantity of the final syllable in each line should be marked), and (for elegiacs and iambics) division into feet.

Examination

The hour-and-a-half examination will include both multiple-choice questions and questions for which the student writes his own responses. Students may be tested for comprehension, translation, detailed criticism, interpretation, and scansion as indicated above. Translations should be as accurate as is consistent with correct English. The exact content and form of the examination will vary from year to year.

The following are sample questions and do not constitute a 90-minute examination. The answer key to the multiple-choice questions is on page 145.

Questions 1-16

Suggested time—20 minutes

Read the following poem* carefully for comprehension and then select the best answer or completion to each of the related questions or incomplete sentences.

*This poem is given for illustrative purposes. Ordinarily, the objective section of the examination will be based on poems selected from the required list.

Catullus writes of his friend's poem, The Magna Mater.

Poetae tenero, meo sodali
velim Caecilio, papyre, dicas,
Veronam veniat, Novi relinquens
Comi moenia Lariumque litus:
nam quasdam volo cogitationes
amici accipiat sui meique.
Quare, si sapiet, viam vorabit,
quamvis candida milies puella
euntem revocet manusque collo
ambas iniciens roget morari,
quae nunc, si mihi vera nuntiantur,
illum deperit impotente¹ amore:
nam quo tempore legit incohatam²
Dindymi Dominam³, ex eo misellae
ignes interiorem edunt medullam.
Ignosco tibi, Sapphica puella
musa doctior: est enim venuste
Magna Caecilio incohata Mater.

—Catullus 35

¹ *impotente*: violent

² *incohatam*, from *incohare*: to begin

³ *Dindymi Dominam*: a poem or play based on the story of Cybele, the Magna Mater.

1. *sodali* (line 1) is
 - (A) nominative
 - (B) genitive
 - (C) dative
 - (D) ablative

2. The meaning would be the same if *dicas* (line 2) were connected to *velim* (line 2) by the conjunction
 - (A) *ut*
 - (B) *ne*
 - (C) *quin*
 - (D) *si*

3. *quasdam cogitationes* (line 5) is the object of
 - (A) *velim* (line 2)
 - (B) *dicas* (line 2)
 - (C) *volo* (line 5)
 - (D) *accipiat* (line 6)

4. *quamvis* (line 8) is best translated
 - (A) although
 - (B) however
 - (C) and yet
 - (D) since

5. *euntem* (line 9) refers to
 - (A) *Caecilio* (line 2)
 - (B) *papyre* (line 2)
 - (C) *amici* (line 6)
 - (D) *puella* (line 8)

6. *quae* (line 11) refers to
 - (A) *puella* (line 8)
 - (B) *manus* (line 9)
 - (C) *vera* (line 11)
 - (D) *amore* (line 12)

7. *misellae* (line 14) is
 - (A) dative singular, modifying *puellae*, understood
 - (B) nominative plural, modifying *ignes*
 - (C) genitive singular, modifying *medullam*
 - (D) genitive singular, modifying *eo*

8. The clause *ex . . . medullam* (lines 14–15) chiefly presents
 - (A) an attack on the content of the work
 - (B) praise for the power of the work
 - (C) an implied criticism of the sensitivity of the reader
 - (D) pity for the author of the work

9. A suitable synonym for *ignosco* (line 16) is
(A) *nescio*
(B) *ignoro*
(C) *parco*
(D) *ardesco*
10. *tibi* (line 16) refers to
(A) *Caecilio*
(B) *Mater*
(C) *musa*
(D) *puella*
11. *venuste* (line 17) is
(A) in the ablative case
(B) in the vocative case
(C) used as a noun
(D) used as an adverb
12. The clause *est . . . Mater* (lines 17–18) emphasizes that the
(A) beginning of the work is good, the rest is poor
(B) work is not bad, considering that Caecilius wrote it
(C) Magna Mater has inspired Caecilius
(D) work has only been begun
13. The tone of the poem is
(A) chiefly light-hearted
(B) heavily sarcastic
(C) predominantly sad
(D) somewhat jealous
14. The meter of this poem is
(A) Sapphic strophe
(B) hendecasyllabic
(C) iambic trimeter
(D) choliambic

15. The most prominent metaphorical language of the poem is drawn from
- (A) travel
 - (B) battle
 - (C) eating
 - (D) religion
16. Which of the following affects the girl's attitude toward the poet?
- (A) The power of the muse
 - (B) The charm of his poetry
 - (C) His willingness to die for her
 - (D) His vow to Magna Mater

Questions 17-24

Suggested time—30 minutes

Read but do NOT translate the following excerpts from familiar poems, answering briefly the questions given below each excerpt.

*Milesne Crassi coniuge barbara
turpis maritus vixit et hostium—
pro curia inversique mores!—
consenuit socerorum in armis?*

17. The phrasing of the first two lines of this excerpt is designed to recall other figures who are not mentioned; who are these?
18. The development of the thought in this poem leads the poet to a stern example from history; what is this example?
19. Copy this excerpt, mark the scansion, and identify the meter of the poem.

*Tua nunc opera meae puellae
flendo turgiduli rubent ocelli.*

20. Who is addressed in the phrase *Tua nunc opera*?
21. What is the effect of the diminutives in this excerpt?
 "Sic," inquit, "mea vita Septimille,
 *huic uni domino usque serviamus,
 ut multo mihi maior acriorque
 ignis mollibus ardet in medullis."
22. What is the structure of the poem from which these lines are taken?
23. Describe two noteworthy sound effects in this excerpt.
24. Copy the second line of this excerpt (marked with an asterisk), mark the scansion, and identify the meter of the poem.

PROSE

Course This course should take about a semester if done as a major course, or it could be taught as a minor course extending over a full year. There are two options: the philosophical works of Cicero or the work of Livy. For examination purposes it will be assumed that the student has read, in Latin, the following works of the author he has studied: Cicero's *Tusculan Disputations* (Book I), *De Senectute*, and *Somnium Scipionis*, or Livy, Book I (praef.-chapter 40) and Book XXI.

It is important that the student receive extensive practice in reading at sight. Some study of relevant aspects of the literary, political, and social background should be included.

Examination The hour-and-a-half examination will include both multiple-choice questions and questions for which the student writes his own responses. Students may be tested on sight passages for comprehension or translation, on familiar passages for detailed

criticism or interpretation, and on background information. Translations should be as accurate as is consistent with correct English. The exact content and form of the examination will vary from year to year.

The following are sample questions and do not constitute a 90-minute examination. The answer key to the multiple-choice questions is on page 145.

Questions 1-10

Suggested time—15 minutes

Read the following passage* carefully for comprehension and then select the best completion to each of the related incomplete statements.

Habet populus Romanus, ad quos gubernacula rei publicae deferat. Habet quidem certe res publica adulescentes nobilissimos paratos defensores. Et nomen pacis dulce est et ipsa res salutaris, sed inter pacem et servitum plurimum interest. Pax est tranquilla libertas, servitus postremum malorum omnium non modo bello, sed morte etiam repellendum.

—Cicero

1. In line 1, *quos*
 - (A) refers to the Roman people
 - (B) refers to the understood object of *Habet* (line 1)
 - (C) is interrogative
 - (D) refers to the object of *deferat* (line 2)

2. *gubernacula* (line 1) is best translated
 - (A) control
 - (B) helmsman
 - (C) governor
 - (D) rubber

*The multiple-choice section of the examination will ordinarily be based on two sight passages, one each from a work similar in style to the required Cicero and Livy readings.

3. *deferat* (line 2) is best translated
(A) to destroy
(B) to drive away
(C) to take away
(D) to confer
4. What is *quidem* (line 2)?
(A) Adjective
(B) Adverb
(C) Pronoun
(D) None of the above
5. The sentence *Habet . . . defensores* (lines 2-3) indicates that the state has
(A) young men ready to defend it
(B) young men and others prepared to defend it
(C) those who are ready to defend its young men
(D) children to be defended by those who are nobly prepared
6. *salutaris* (line 3) describes
(A) the republic
(B) peace
(C) the *gubernacula*
(D) the name of peace
7. *interest* (line 4) is best translated
(A) it makes a difference
(B) there is a difference
(C) it is between
(D) there is between
8. *postremum malorum omnium* (line 5) is best translated
(A) of all the most extreme evils
(B) the most extreme evils of all
(C) the most extreme of all evils
(D) of the most extreme evils of all

9. *non modo* (lines 5–6) is best translated
(A) immoderately
(B) not just
(C) not in any way
(D) not recently
10. In the sentence *Pax . . . repellendum* (lines 4–6) Cicero emphasizes that
(A) peace leads to servitude
(B) peace should be obtained even at the cost of servitude
(C) peace and servitude are opposites
(D) the slavery of war and death must be avoided

Question 11

Suggested time—20 minutes

The concept of the “good Roman citizen” is frequently expressed or implied in Latin literature. Identify two significant qualities essential to this ideal and show how they are presented in the writings of EITHER Cicero OR Livy.

Questions 12-17

Suggested time—20 minutes

Choose ONE of the following two passages. Do NOT translate, but read it through carefully and answer the questions pertaining to the passage you have chosen.

Passage for Questions 12–14

“Sed quo sis, Africane, alacrior ad tutandam rem publicam, sic habeto: omnibus qui patriam conservarint, adiuverint, auxerint, certum esse in caelo definitum locum, ubi beati aevo sempiterno fruuntur. Nihil est enim illi principi deo,
(5) qui omnem mundum regit, quod quidem in terris fiat acceptius, quam concilia coetusque hominum iure sociati,

quae civitates appellantur. Harum rectores et conservatores hinc perfecti huc revertuntur." Hic ego, etsi eram perterritus, non tam mortis metu quam insidiarum a meis, (10) quaesivi tamen viveretne ipse et alii quos nos extinctos esse arbitraremur. "Immo vero," inquit, "hi vivunt, qui e corporum vinculis, tamquam e carcere evolaverunt, vestra vero quae dicitur vita mors est."

—Cicero, *Somnium Scipionis* 5–6

12. Who is speaking to Africanus in this passage?
13. What is the thought expressed in the following sentence (lines 4–7)?

Nihil est enim illi principi deo, qui omnem mundum regit, quod quidem in terris fiat acceptius, quam concilia coetusque hominum iure sociati, quae civitates appellantur.

14. What is the paradox in the last sentence of the passage?

Passage for Questions 15–17

"Juvenem flagrantem cupidine regni, viamque unam ad id cernentem, si ex bellis bella serendo succinctus armis legionibus vivat, velut materiam igni praebentes, ad exercitus misistis. Aluistis ergo hoc incendium, quo nunc (5) ardetis. Saguntum vestri circumsedent exercitus unde arcentur foedere; mox Carthaginem circumsedebunt Romanae legiones ducibus iisdem diis per quos priore bello rupta foedera sunt ulti. Utrum hostem an vos an fortunam utriusque populi ignoratis? Legatos ab sociis et pro sociis (10) venientes bonus imperator vester in castra non admisit; ius gentium sustulit; hi tamen, unde ne hostium quidem legati arcentur pulsi, ad vos venerunt. Res ex foedere repetuntur; publica fraus absit; auctorem culpae et reum criminis deprecantur."

—Livy, *Ab Urbe Condita* 21.10. 4–7

15. To whom is this speech addressed?
16. To what does *priore bello* in line 7 refer?
17. To whom does the pronoun *hi* in line 11 refer? For what purpose have they come?

ANSWER KEY TO MULTIPLE-CHOICE QUESTIONS, LATIN

VERGIL

1-B, 2-D, 3-C, 4-D, 5-A, 6-C, 7-D, 8-B, 9-A, 10-C,
11-A

COMEDY

1-D, 2-B, 3-A, 4-C, 5-C, 6-B, 7-D, 8-C, 9-B, 10-B

LYRIC

1-C, 2-A, 3-D, 4-A, 5-A, 6-A, 7-A, 8-B, 9-C, 10-D,
11-D, 12-D, 13-A, 14-B, 15-C, 16-B

PROSE

1-B, 2-A, 3-D, 4-B, 5-A, 6-B, 7-B, 8-C, 9-B, 10-C

MATHEMATICS



A College Board Advanced Placement course in mathematics should consist of a full academic year of work in calculus and related topics that is comparable to courses in colleges and universities. The nature of such courses differs among secondary schools, just as it does among colleges, depending upon the curriculum of the school and the preparation of students. Recognizing this situation, the Advanced Placement Program for the first time offers descriptions of two calculus courses for use in the school year 1968-69. Accordingly, beginning in May 1969 and thereafter, the College Entrance Examination Board will offer two Advanced Placement Examinations in Mathematics. Each Advanced Placement candidate will write only one examination—whichever is more appropriate to his preparation. The two course descriptions and the two corresponding examinations are denoted Calculus AB and Calculus BC.

Calculus AB can be offered as an Advanced Placement course in the senior year by any school that is able to organize a curriculum for mathematically talented students in which all of the prerequisites for a combined year's course in elementary functions and calculus are completed prior to grade 12. If students are to be adequately prepared for the Calculus AB examination, well over half of that year course must be devoted to topics in differential and integral calculus.

Calculus BC can be offered by schools that are able to complete before grade 12 a substantial introduction to elementary functions in addition to the prerequisites for Calculus AB. Calculus BC is an intensive full-year course in calculus that places due

emphasis on theoretical aspects of the calculus of functions of a single variable and that includes topics in infinite series and differential equations.

Both courses described here represent college-level mathematics for which many colleges grant advanced placement and credit. The calculus content of Calculus AB is somewhat reduced from that of the 1966-68 course description, but that of Calculus BC is more extensive. They are comparable to courses outlined in a 1965 report entitled "A General Curriculum in Mathematics for Colleges" (GCMC), which was prepared for the Mathematical Association of America by its Committee on the Undergraduate Program in Mathematics (CUPM).^{*} That curriculum begins with Elementary Functions (Mathematics 0), a bridge between school and college. There is a growing movement to include this material in high school, but it is still taught in many colleges. Other GCMC courses pertinent to the Advanced Placement Program are Introductory Calculus (Mathematics 1—second version) and Calculus (Mathematics 2—first version). Advanced Placement Calculus AB corresponds approximately to GCMC Mathematics 0 and 1, whereas Calculus BC is similar to GCMC Mathematics 1 and 2.

Most colleges and universities offer a calculus sequence of several semester courses; entering students are placed within this sequence according to the extent of their preparation as measured by the results of an Advanced Placement Examination or other criteria. Academic credit or advanced placement is granted in accordance with a policy established by each institution. The content of Calculus BC is designed to qualify the student for placement one semester beyond that granted for Calculus AB. In deciding which Advanced Placement Examination a candidate should write, he and his teacher should weigh carefully the extent and degree of his preparation in calculus.

Schools have a choice of several possible actions regarding Advanced Placement Mathematics. The option that is most

^{*}Copies of the GCMC report may be obtained without charge by writing to CUPM Central Office, P.O. Box 1024, Berkeley, California 94701.

appropriate for a particular school depends upon local conditions and resources: school size, its curriculum, the preparation of its teachers, and the interest of its students, teachers, and administrators.

1. *Offer no Advanced Placement Mathematics.* Schools that have not previously offered a substantial course in calculus might be well advised to strengthen their present course offerings in algebra, geometry, trigonometry, analytic geometry, and elementary functions before offering Advanced Placement Mathematics.

2. *Offer Calculus AB only.* Schools that have developed a strong program in the studies prerequisite to calculus but that have not previously offered Advanced Placement Mathematics might best enter this program by first offering Calculus AB only. Similarly, some schools now teaching Advanced Placement Mathematics might find Calculus AB to be more appropriate for their students, curriculum, and resources. A few exceptional students who elect Calculus AB might be encouraged to study independently the additional content of Calculus BC.

3. *Offer Calculus BC only.* Schools that have had successful experience in teaching Advanced Placement Mathematics might readily adjust to the expanded content of Calculus BC, incorporating the additional prerequisites into earlier courses.

4. *Offer both Calculus AB and Calculus BC.* Large schools with a wealth of student talent in mathematics and with experience in teaching Advanced Placement Mathematics might prefer to offer both courses to accommodate able students having different preparations and levels of maturity in mathematics.

Because of the sequential nature of mathematics, any school that offers either Advanced Placement course in mathematics or both courses must design its mathematics curriculum carefully so that a full college preparatory mathematics program*

*An example of such a mathematics program for grades 9, 10, 11, and the first semester of grade 12 is described in detail in the Report of the Commission on Mathematics, *Program for College Preparatory Mathematics*. New York: College Entrance Examination Board, 1959, 63 pp.

can be completed by Advanced Placement candidates no later than the end of grade 11. This can be accomplished, for example, in one or more of the following ways: starting the study of secondary school mathematics in grade 8; reorganizing the content of courses; establishing accelerated sections for the more capable students; encouraging the election of more than one mathematics course in grade 9, 10, or 11; instituting programs of summer study or guided independent study during the academic year. It is highly desirable, therefore, that potential Advanced Placement candidates be identified and placed in appropriate mathematics courses as early as possible, even in grade 7 or 8.

In redesigning a school curriculum, teachers should carefully consider not only the content but also the level of sophistication at which new concepts are introduced. Intuition is extremely important in mathematics; on the other hand, a deep understanding of some mathematical concepts is best acquired by formal, rigorous treatment. Many mathematicians attempt to achieve both of these objectives—intuition and precision—by using a spiral approach in which an idea is first introduced intuitively and later reexamined, perhaps several times, at gradually increasing levels of rigor. Aside from differences of content, the major distinction between Calculus AB and Calculus BC is that Calculus AB is primarily concerned with an intuitive understanding of the concepts of calculus and experience with its methods and applications whereas Calculus BC requires deeper knowledge of the theoretical tools of calculus. Use of the word “intuitive” is not meant to suggest a reduction of either clarity of concept or precision of expression. Rather it attempts to distinguish between a calculus course that emphasizes precise proofs of all theorems—rigor in the formal sense—and a calculus course that states definitions and theorems correctly but that frankly defers some proofs until a later course.

Calculus AB

This course is intended for students who have a thorough knowledge of college preparatory mathematics, including algebra,

axiomatic geometry, trigonometry, and analytic geometry (rectangular and polar coordinates, equations and graphs, lines, and conics). It does not assume that they have acquired sound understanding of the theory of elementary functions. The development of this understanding has first priority.

Course

A course in elementary functions and introductory calculus can be arranged in many ways, and the arrangement suggested in the following course outline for Calculus AB is not intended to be prescriptive. In this version the special functions are first studied in some detail with the aid of calculus, which is introduced intuitively, and later the general techniques of calculus are developed and applied to a wide class of functions. A more traditional approach would be to study the elementary functions without calculus and then to develop the general theory and techniques of the calculus.

A. Polynomial functions

1. Definition of polynomial functions; function notation
2. Algebra of polynomials (degree, division algorithm, remainder theorem, factor theorem, existence and number of roots, location of rational roots, approximation of irrational roots)
3. Derivative (slope of the tangent line)
4. Applications of derivatives
 - a. Graphs (increasing and decreasing functions, relative maximum and minimum points, concavity, and points of inflection)
 - b. Extreme value problems
 - c. Velocity and acceleration of a particle moving along a line
5. Antiderivative
 - a. Distance and velocity from acceleration with initial conditions

b. Polynomials as solutions of $y^{(n)} = 0$ (nth derivative identically zero)

B. Sine and cosine functions

1. Definition, fundamental identities, addition formulas
2. Graphs and periodicity of $A \sin(bx + c)$ and $A \cos(bx + c)$
3. Derivatives of $\sin x$ and $\cos x$
4. Derivatives of $\sin(bx + c)$ and $\cos(bx + c)$
5. Linear approximation of $\sin x$ near $x = 0$
6. Polynomial approximations of $\sin x$ and $\cos x$
7. Antiderivatives
8. Solutions of $y'' = -k^2y$; simple harmonic motion

C. Exponential and logarithmic functions

1. The functions a^x and $\log_a x$ (for $a > 0$, $a \neq 1$, and $x > 0$); properties, graphs; their inverse relationship
2. The number e such that $\lim_{n \rightarrow \infty} \left(1 + \frac{1}{n}\right)^n = e$ and $\lim_{x \rightarrow 0} \frac{e^x - 1}{x} = 1$
3. The derivatives of the exponential functions e^x and Ae^{kx} and of the logarithmic function $\ln x$ (i.e. $\log_e x$)
4. Solutions of $y' = ky$ and of $y' = cx^{-1}$; applications to growth and decay
5. Polynomial approximations of e^x and $\ln(1 + x)$

D. Area, average value, and the definite integral

1. Concepts of area and average (mean) ordinate
2. Approximations: by inscribed and circumscribed rectangles and by trapezoids
3. The definite integral; definition and properties
4. The fundamental theorem
5. Calculation of areas and average values for polynomial, sine, cosine, and exponential functions by the fundamental theorem

E. Calculus of more general functions

1. The function concept; algebra of functions: sum, product, quotient, composite, inverse

2. Limits of functions; statement of properties
3. Continuity
4. Definition of the derivative
5. Derivative of sum, product, quotient (including $\tan x$)
6. Derivative of a composite function (chain rule)
7. Derivative of an implicitly defined function; logarithmic differentiation
8. Derivative of a rational power of a function
9. Derivative of the inverse of a function (including $\arcsin x$ and $\arctan x$)
10. Integration by substitution
11. Rolle's theorem; mean value theorem
12. Applications of the derivative
 - a. Slope of a curve
 - b. Average and instantaneous rates of change
 - c. Maximum and minimum values, both relative and absolute
 - d. Discussion and sketching of curves (including such functions as $e^{-x} \sin x$ and $|f(x)|$)
 - e. Related rates of change
13. Applications of the integral
 - a. Average (mean) value of a function on an interval
 - b. Areas between curves
 - c. Volumes of simple solids of revolution
 - d. Use of integration and inequalities to get polynomial approximations to $\sin x$, $\cos x$, e^{-x} , $\ln(1 + x)$
 - e. Interpretation of $\ln x$ as area under the graph of $y = x^{-1}$

Calculus BC This course is intended for students who have a thorough knowledge of analytic geometry and elementary functions in addition to college preparatory algebra, geometry, and trigonometry.

Course

Calculus BC is a year course in calculus, considerably more intensive and more extensive than Calculus AB. All of the calculus topics in Calculus AB are included, but they are pursued in greater depth and with more emphasis on theory and formal proof, and other topics are added. The following topics should have been covered by the end of the course. The list is intended to indicate the scope of the course and not necessarily the order in which the topics are to be studied.

A. Fundamental concepts

1. Real numbers, least upper bound axiom
2. Definition of a function, function notations
3. Limit of a function (including epsilon-delta definition)
4. Properties of limits
5. Continuity of a function
6. Properties of continuous functions

B. The derivative

1. Definition of the derivative
2. Relation between differentiability and continuity
3. Derivative of sum, product, and quotient of functions; composite function (chain rule); implicitly defined functions
4. Derivatives of algebraic functions
5. Rolle's theorem; mean value theorem

C. Applications of the derivative

1. Tangent and normal lines to a curve
2. Discussion and sketching of curves
3. Extreme value problems, both relative and absolute
4. Velocity and acceleration of a particle moving along a line
5. Related rates of change
6. The differential; linear approximation of a function
7. L'Hôpital's rule

D. The definite integral

1. Definition and basic properties

2. Recognition of limits of sums as definite integrals
 3. The concept of area and average (mean) ordinate
 4. Approximations: upper and lower sums, trapezoid rule, Simpson's rule
 5. The fundamental theorem (various forms)
 6. Antiderivatives (indefinite integrals)
 7. Functions defined by integrals: $\ln x = \int_1^x \frac{dt}{t}$, ($x > 0$)
- E. Transcendental functions**
1. Definition of e^x as the inverse function of $\ln x$
 2. Derivative of e^x and $\ln x$
 3. Logarithmic differentiation
 4. Solutions of the differential equations: $y' = ky$ and $y' = kx^{-1}$; applications to growth and decay
 5. Derivatives and antiderivatives of trigonometric functions
 6. Solutions of $y'' = -k^2y$; simple harmonic motion
 7. The functions a^x and $\log_a x$ (for $a > 0$, $a \neq 1$, and $x > 0$); properties, derivatives, graphs, inverse relationship
 8. Derivatives of $\arcsin u$ and $\arctan u$
- F. Techniques of integration**
1. Integration by simple substitution (use of identities and change of variable)
 2. Integration by parts
 3. Trigonometric substitution
 4. Partial fractions
- G. Applications of the definite integral**
1. The average (mean) value of a function
 2. Area between curves
 3. Area bounded by polar curves
 4. Volumes of solids with regular cross sections, including solids of revolution
 5. Work
 6. Improper integrals
- H. Geometry in the plane**
1. Vectors in the plane
 2. Parametric representation of a plane curve

3. Velocity and acceleration vectors for motion on a plane curve
 4. Curvature
 5. Length of path
 6. Areas of surfaces of revolution
- I. Sequences and series
1. Sequences of real numbers and their convergence
 2. Bounded and monotonic sequences
 3. Series of real numbers and their convergence
 4. Absolute convergence of series
 5. Tests for convergence: comparison, ratio, and integral tests
 6. Sequences and series of functions; convergence
 7. Power series
 8. Taylor series with remainder
- J. Elementary differential equations
1. First order, variables separable
 2. First order, linear
 3. Second order, linear with constant coefficients (both homogeneous and very simple nonhomogeneous)
 4. Applications with initial conditions

Although the foregoing topics are treated in many textbooks, few textbooks currently in print contain all of the material in Calculus AB. Also some schools now participating in the Advanced Placement Program in Mathematics may find that their present textbooks lack some of the topics included in Calculus BC, although there are books available that cover all the necessary material. Until more comprehensive books are available, teachers may find it necessary to combine material from more than one textbook in teaching these courses.

In deciding which of these courses to teach and in planning the course, many teachers will find it helpful to seek the advice of departments of mathematics in schools that have had experience with the Program and in colleges in their vicinity or to which their students may be applying. *Another important source of infor-*

tion is the annual *Advanced Placement Conference in Mathematics*. Further information or assistance can be obtained by writing to the appropriate College Board Regional Office.

Examinations Each Advanced Placement Examination in Mathematics is three hours long and seeks to determine how well a student has mastered the concepts and techniques of the subject matter of the corresponding course. An examination normally consists of (1) a multiple-choice section testing proficiency in a large variety of topics, and (2) a problem section that requires solutions in detail, giving the student an opportunity to demonstrate his ability to carry out proofs and solve problems involving a more extended chain of reasoning. Since each examination is designed for full coverage of the subject matter, it is not expected that many students will be able to answer all the questions.

The following questions are typical of those that might be included in the examination. The first 15 questions are multiple choice and are to be answered by selecting one of the five choices lettered (A) to (E). The remainder are illustrative of questions requiring detailed answers.

Questions 1–4 and 16–17 are examples of the kind of questions that might be found only on the Calculus AB examination. Questions 12–15 and 22–24 are examples of the kind of questions found only on the Calculus BC examination. The remaining questions could appear on either examination or on both. When a question appears in both examinations, the grading standards will be identical.

Multiple-choice questions

CALCULUS AB ONLY

1. If $f(x) = 2x^3 + 3$ and $f(g(x)) = 2x^2 - 5$, then $g(x) =$
- (A) $x - \frac{3}{5}$ (B) $\frac{2x^2 - 5}{2x^3 + 3}$ (C) $\frac{(2x)^{3/5} - 8}{2}$
- (D) $x^{3/5} - 4$ (E) $(x^2 - 4)^{3/5}$

2. What is the fundamental period of the function f given by $f(x) = |\cos 2x| + |\sin 3x|$?
 (A) $\frac{2}{3}\pi$ (B) π (C) $\frac{3}{2}\pi$ (D) 2π (E) 6π
3. If $f(x) = px^7 + qx^3 + rx - 4$ and $f(-7) = 3$, what is the value of $f(7)$?
 (A) -11 (B) -3 (C) 10 (D) 17
 (E) It cannot be determined from the information given.
4. The slope of the line joining the point $P(x, y)$ to the origin is always twice the slope of the line joining P to the point $(2, 1)$. An equation of the locus of the point P is
 (A) $xy - 4y + x = 0$ (B) $xy + y - 4x = 0$
 (C) $xy + 2y - 2x = 0$ (D) $2x^2 - 5x + 2y = 0$
 (E) $2x^2 - 4x - y^2 + y = 0$

CALCULUS AB OR CALCULUS BC

5. What is the area of the region in the first quadrant bounded by the X-axis and the graph of $y = x - x^2$?
 (A) 1 (B) $\frac{1}{2}$ (C) $\frac{1}{3}$ (D) $\frac{1}{6}$ (E) 0
6. The derivative of $(x + y)^2$ with respect to x , where y represents a differentiable function of x , is
 (A) $2\left(1 + \frac{dy}{dx}\right)$ (B) $2(x + y)$ (C) $2(x + y)\left(1 + \frac{dy}{dx}\right)$
 (D) $2(x + y)\frac{dy}{dx}$ (E) $2x + 2y\frac{dy}{dx}$
7. If $xy^2 = 16$, what is the minimum value of $z = x^2 + y^2$?
 (A) $z = 12$ (B) $z = 15$ (C) $z = 17$ (D) $z = 19$
 (E) None of the above

8. A particle moves on the X-axis so that its position at any time t is given by $x = p \sin kt$, where p and k are constants. The acceleration of the particle at $t = \frac{\pi}{2k}$ is
 (A) $-pk^2$ (B) $-pk$ (C) 0 (D) pk (E) pk^2
9. The value of $\lim_{h \rightarrow 0} \frac{e^{a+h} - e^a}{h}$ is
 (A) 0 (B) $\frac{1}{a}$ (C) 1 (D) e^a (E) ∞
10. The average value of $\sec^2 x$ over the interval from $x = \frac{\pi}{6}$ to $x = \frac{\pi}{3}$ is
 (A) $\frac{2\sqrt{3}}{3\pi}$ (B) $\frac{2\sqrt{3}}{3}$ (C) $\frac{4\sqrt{3}}{\pi}$ (D) $\frac{20}{9}$ (E) $\frac{8}{3}$
11. If $\frac{dx}{dt} = -10x$ and if $x = 50$ when $t = 0$, then $x =$
 (A) $50 \cos 10t$ (B) $50e^{-10t}$ (C) $50e^{10t}$
 (D) $50 - 10t$ (E) $50 - 5t^2$

CALCULUS BC ONLY

12. What is the work (in foot pounds) done by a force F (in pounds), propelling a particle along the X-axis from $x = 1$ to $x = 4$ (in feet), if $F = \frac{1}{\sqrt{x}}$?
 (A) $\frac{1}{2}$ (B) $\frac{2}{3}$ (C) $\frac{3}{4}$ (D) 1 (E) 2

13. What is the coefficient of $\left(x - \frac{\pi}{2}\right)^6$ in the Taylor series expansion about $\frac{\pi}{2}$ of $f(x) = \sin x$?
- (A) $-\frac{1}{6}$ (B) $-\frac{1}{720}$ (C) 0 (D) $\frac{1}{720}$ (E) $\frac{1}{6}$
14. The infinite series $1 - \frac{x}{2} + \frac{x^2}{3} - \frac{x^3}{4} + \dots + (-1)^{n-1} \frac{x^{n-1}}{n} + \dots$ diverges if and only if
- (A) $x < -1$ or $x > 1$ (B) $x < -1$ or $x \geq 1$
 (C) $x \leq -1$ or $x \geq 1$ (D) $x \leq -1$ or $x > 1$
 (E) $x \neq 0$
15. If $f(x) = [f'(x)]^2$ for all real x and if $f'(0) = 0$ and $f'(x) \neq 0$ for $x \neq 0$, then $f(4) =$
- (A) $\frac{1}{4}$ (B) $\frac{1}{2}$ (C) 1 (D) 2 (E) 4

Questions requiring detailed answers

CALCULUS AB ONLY

16. Find an equation of the tangent line to the graph of $f(x) = 6x^3 - 5x^2 + 5x - 12$ at each point $(b, f(b))$ for which $f(b) = 0$.
17. A tangent is drawn to the right-hand branch of the hyperbola $x^2 - y^2 = a^2$ at an arbitrary point (x_1, y_1) . The tangent and the two asymptotes of the hyperbola form a triangle. Prove that the area of the triangle is always a^2 square units.

CALCULUS AB OR CALCULUS BC

18. A region of the first quadrant is bounded by the graphs of $y = x^3$, $y = 4x$, and $2x + y - 3 = 0$ and lies below both straight lines. Find the area of this region.

19. Discuss the graph of $y = x^2e^{-x}$. Consider
- intercept(s)
 - maxima and minima
 - points of inflection
 - behavior for large $|x|$
 - asymptote(s)
 - symmetry
 - continuity of the function and its first derivative.
- Use this information to *sketch the curve*.
20. A particle P moves along a line from point A to point B. During the motion the acceleration of P is given by the formula $a(t) = 16 - 12t^2$ where $t = 0$ when P is at A. If the particle starts from rest at A and comes to rest again for the first time at B, how far is it from A to B?
21. Find the maximum cross-section area, perpendicular to the X-axis, of the solid formed by revolving about the X-axis the region bounded by the graphs of $y = x^2$ and $y = x$.

CALCULUS BC ONLY

22. (a) Test for convergence and cite reasons for your conclusion.
- $$\frac{1}{\sqrt[3]{4+1}} + \frac{1}{\sqrt[3]{4+4}} + \frac{1}{\sqrt[3]{4+9}} + \cdots + \frac{1}{\sqrt[3]{4+n^2}} + \cdots$$
- (b) Find all values of x for which the following power series converges. Justify your conclusions.
- $$\frac{x+2}{1 \cdot 3} + \frac{(x+2)^2}{2 \cdot 9} + \frac{(x+2)^3}{3 \cdot 27} + \cdots + \frac{(x+2)^n}{n \cdot 3^n} + \cdots$$
23. Given the differential equation $y'' + 4y' + 4y = ke^{-2x}$, k a constant, and the initial conditions $y = y' = 1$ when $x = 0$,
- Find a solution for the case $k = 0$.
 - Find a solution for the case $k = 1$.

24. (a) Use the definition of the definite integral as the limit of a sum to show that

$$\lim_{n \rightarrow \infty} \sum_{k=1}^n \frac{1}{n+k} = \lim_{n \rightarrow \infty} \sum_{k=1}^n \left(\frac{1}{1 + \frac{k}{n}} \right) \frac{1}{n} = \ln 2 \text{ (i.e., } \log_e 2 \text{)}.$$

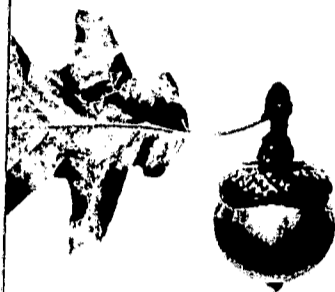
- (b) By a similar procedure, determine the value of

$$\lim_{n \rightarrow \infty} \sum_{k=1}^n \frac{1}{\sqrt{n^2 + kn}}$$

**ANSWER KEY TO MULTIPLE-CHOICE
QUESTIONS, MATHEMATICS**

1-E, 2-B, 3-A, 4-C, 5-D, 6-C, 7-A, 8-A, 9-D, 10-C,
11-B, 12-E, 13-B, 14-D, 15-E

PHYSICS



In May 1969, for the first time two Advanced Placement Examinations in Physics will be given. One examination will be for students who have taken the Advanced Placement course Physics B, and the other for those who have taken the Physics C course. The Physics B and Physics C courses and the new examinations are described below.

Any Advanced Placement secondary school course in physics should aim at developing the student's abilities in several areas. The student who deserves advanced placement and credit in college should be able to:

1. Demonstrate a clear understanding of important physical concepts and principles, together with their restrictions or limitations
2. Read, understand, and interpret physical information, verbal, mathematical, and graphical
3. Apply the physical principles that are relevant to a familiar or unfamiliar situation
4. Use basic mathematical reasoning—arithmetic, algebraic, geometric, trigonometric, and calculus where appropriate (see below)—in a physical situation or problem
5. Explain in his own words the analysis and reasoning used in describing a particular physical phenomenon or interaction, that is,
 - a. State the principles or definitions that are applicable
 - b. Specify relevant limitations to their application
 - c. Give the steps of reasoning, either verbally or mathematically

- d. Interpret the results or conclusions
6. Recognize the reasons for the acceptance or "truth" of statements, whether by definition, by logical deduction from accepted laws or principles, or by generalization from experimental observations
 7. Understand that physics is, in essence, a process of inquiry
 8. Design experiments, execute them, and interpret the results
 9. Assess systematic and random errors in laboratory measurements, and determine the effects of these errors on laboratory results

In the achievement of these goals, coverage of many detailed topics is less important than the development of a mature understanding of the basic principles of physics, through careful treatment of well-chosen areas.

Those teaching the Advanced Placement secondary school course should consider its relation to the student's subsequent college program. Introductory college physics courses usually fall into one of three categories from the point of view of general sophistication. In the discussion that follows, these three categories are designated A, B, and C.

Category A, the first of these, includes courses of the so-called cultural type. Emphasis is on general principles at a relatively elementary level. Students are generally humanistically oriented and are anxious to develop a broad comprehension of science in the modern world. As a rule, these courses entail two to three lectures per week for one academic year. There is little laboratory work, if any. The mathematical sophistication expected of the students may extend to trigonometry, but rarely beyond. There is no Advanced Placement Examination for the A course.

Type B expects and develops deeper understanding of the subject than A does. This type of course is fairly quantitative, developing many of the principles to the point where problems of moderate difficulty can be solved. It is assumed that the student is familiar with trigonometry and algebra, and, although no calculus

is used directly, some development of theory uses parallel techniques. As a rule this is a terminal course and does not constitute adequate preparation for more advanced physics and engineering courses. The Type B course provides a solid foundation in physics for students in some biological sciences, premedicine, and some applied sciences.

At colleges, the Type C sequence serves as the introduction to physics for students who wish to major in the physical sciences or in engineering. This sequence is paralleled, or sometimes preceded, by mathematics courses that include calculus. Methods of calculus are used where appropriate in formulating physical principles and in applying them to physical problems. The sequence is more rigorous and analytic than the Type B course. There is emphasis on analysis in the laboratory as well as in the classroom. In many colleges the Type C sequence extends over more than one academic year.

In a few colleges and universities, other types of unusually high level "introductory" courses are taken by a few carefully selected students. Selection of students for these courses is based upon performance in either a college administered examination, the Advanced Placement Examinations, or the first term in the college. Such courses are at a higher level than Type C, and the Advanced Placement Examination does not attempt to test for achievement in them.

There are several circumstances in which it would be worthwhile for a student in secondary school to take an advanced course of the Type B mentioned above. He may be interested in studying physics as a basis for more advanced work in biological science, medicine, certain areas of chemistry and geology, education, or even in a nonscience area. Credit or advanced placement in a Type B physics course would provide the student with an opportunity either to accelerate and further enrich his college program or to meet a basic science requirement.

Students planning to specialize in physics or engineering will find that most colleges recommend an introductory college

physics course of the C type. Such students are advised that if there is some question of choice of Advanced Placement subjects that they should place primary effort on preparing themselves for advanced placement in mathematics. Those students who also prepare themselves for advanced placement in Type C physics and show competence in both will be in a very favorable position to be granted advanced placement in a substantial part of a Type C sequence. In most colleges and universities a student will need advanced placement in *both* mathematics and Type C physics to take a second-year or next-in-sequence physics course during his first year. Either of the College Board Advanced Placement Mathematics courses, Calculus AB or Calculus BC, would provide an acceptable basis for a student preparing for a major in the physical sciences or in engineering, but Calculus BC is recommended.

Beginning in May 1969 there will be two separate Advanced Placement Physics Examinations, one for students who have taken the Advanced Placement course Physics B and the other for students who have taken the Advanced Placement course Physics C. It is understood that each Advanced Placement course, Physics B or Physics C, represents one year of college physics. Physics B corresponds to the college physics course Type B, and Physics C corresponds to the first portion of the college physics Type C sequence. Further descriptions of these two Advanced Placement courses in terms of topics, level, mathematical rigor, and typical textbooks are presented in the following paragraphs.

Courses Physics B

The Physics B course will treat a wide range of topics. It is recommended that relative emphasis on main topics be distributed as follows: mechanics, 25 percent; kinetic theory and heat, 15 percent; electricity and magnetism, 20 percent; waves and optics, 20 percent; modern physics, 20 percent.

The following list is representative of the topics in a Physics B course. Equal attention will not be given to each topic nor will they be studied in the order given. Principal emphasis should be placed on understanding the basic concepts in each topic.

Vector addition

Kinematics (rectilinear, curvilinear, and projectile motion)

Particle dynamics (Newton's laws, friction, universal gravitation, circular orbits, centripetal forces)

Work, energy, and power (kinetic and potential energy, conservation of energy)

Momentum and impulse (conservation of momentum, collisions)

Rotation (rigid bodies and center of mass, torque, angular momentum, gyroscope)

Statics and equilibrium

Simple harmonic motion

Hydrostatics

Hydrodynamics, Bernoulli's principle

Temperature (gas thermometers, thermal expansion)

Heat (heat capacity and heat transfer, first law of thermodynamics)

Thermal properties of matter (phase change, gas laws)

Kinetic theory (ideal gases, equipartition, velocity distributions)

Electric charge, Coulomb's law

Electric field

Potential

Capacitance

Current, resistance, and circuits (dc)

Magnetic forces and fields

Electromagnetic induction (Faraday's law)

Inductance

Waves (traveling and standing, superposition)

Sound waves (beats, Doppler effect)

Electromagnetic waves

Nature and propagation of light

Interference and diffraction
Geometrical optics—mirrors and lens
Spectra
Polarization
Quantum phenomena, wave nature of matter
Applications of atomic phenomena
Special theory of relativity (Lorentz transformation)

The Physics B course is quantitative as well as descriptive in its treatment of physics. A knowledge of algebra, geometry, and the basic trigonometric functions is prerequisite for the B course. The student will be expected to solve problems more challenging than simply substituting numbers into formulas, but the problems will be considerably less analytic than those in the C course.

The following textbooks typify the level of sophistication of the Physics B course.

- Atkins, Kenneth, *Physics*. New York: John Wiley and Sons, Inc., 1965.
Miller, Franklin, Jr., *College Physics*. Second edition, New York: Harcourt, Brace and World, Inc., 1967.
Orear, Jay, *Fundamental Physics*. Second edition, New York: John Wiley and Sons, Inc., 1967.
Richards, Sears, Wehr, and Zemansky, *Modern College Physics*. Reading, Mass.: Addison-Wesley Publishing Company, Inc., 1962.
Rogers, Eric, *Physics for the Inquiring Mind*. Princeton: Princeton University Press, 1960.

Physics C

The main topics in the Physics C course and the relative emphasis on each will be as follows: mechanics, 40–50 percent; electricity and magnetism, 30–40 percent; and kinetic theory and thermodynamics, 10–20 percent.

The topics in the Physics C course are listed below. The topics are not listed in order of importance nor of expected presentation.

Vectors—algebra of vectors including scalar and vector products
Kinematics including variable acceleration (rectilinear, curvilinear, and projectile motion)
Particle dynamics (Newton's laws, friction, planetary motion, centripetal forces)
Gravitation (universal law of gravitation, gravitational field, gravitational potential energy)
Work, energy, and power (kinetic and potential energy, conservation of energy)
Momentum and impulse (conservation of momentum, collisions)
Rotation (rigid bodies and center of mass, torque, moment of inertia, angular momentum)
Oscillations and simple harmonic motion
Kinetic theory (ideal gases, equipartition, velocity distributions, temperature)
Thermodynamics (first and second laws, heat engines)
Thermal properties of matter (heat capacity, expansion, phase changes)
Electric charge, Coulomb's law
Electric field, Gauss' law in integral form
Electric potential
Capacitance and dielectrics
Current and resistance
Magnetic forces and fields, Ampere's law in integral form
Electromagnetic induction, Faraday's law in integral form, inductance
Circuits (dc, ac, resonance and oscillations)

Although the above list bears a superficial resemblance to parts of the B course, the level of sophistication is substantially higher. Calculus will be used sparingly at first as the student learns to apply rather unfamiliar mathematical ideas to the solution of puzzling problems. Eventually the use of calculus and other mathematical techniques will provide a notational framework within which the ideas of physics are expounded. The student

will learn to translate an unfamiliar problem into symbolic terms that are susceptible to analytic treatment and then proceed to a solution. In the event that exact analysis is difficult and beyond the scope of the student's background, approximations will be attempted occasionally.

With respect to the language of calculus, both scalar and vector products are utilized in the Physics C course. Derivatives and simple integrals will be freely used in mechanics. Gauss' law and Ampere's law for electric and magnetic fields usually will be discussed in terms of surface and line integrals, respectively. In this area, there often will be more calculus appearing in the development of the subject than in the problems solved. The differential equation for the harmonic oscillator might also be developed.

Some textbooks that typify the level of sophistication of a Physics C course include:

Halliday and Resnick, *Physics for Students of Science and Engineering*. New York: John Wiley and Sons, Inc., 1962.

Sears and Zemansky, *University Physics*. Third edition, Reading, Mass.: Addison-Wesley Publishing Company, Inc., 1964.

Weidner and Sells, *Elementary Classical Physics*. Boston: Allyn and Bacon, Inc., 1965.

For more information on textbooks used in introductory college physics courses see the article "Introductory Physics Textbooks," by Peter G. Roll, in *Physics Today*, Volume 21, Number 1, January 1968, page 63.

Laboratory

In planning an advanced physics course, thought must be given to the laboratory instruction. In classwork, textbooks, and problems, most attention is paid to idealized situations: friction is assumed to be constant or absent; meters read true values; heat insulators are perfect; gases follow the ideal gas equation. It is in the laboratory where the validity of these assumptions can be

questioned, where the student meets nature as it is rather than in idealized form. Therefore, to derive benefit from laboratory experience, the student should do more than follow a set of detailed instructions in perfunctory fashion. Though much of his classroom work will be concerned with deductive procedures, he should also learn how generalizations are arrived at inductively from empirical observations. In general, he should come in personal contact with experiments, both to acquire useful training and to gain some understanding of experimental physics. The laboratory should require a higher level of independent, thorough experimentation than is usual in the traditional secondary school course. Greater precision in measurement, with some consideration of errors, significant figures, and use of graphing in data analysis should contribute valuable training. The remarks and examples below are intended to amplify this discussion of laboratory work.

A frequent question in discussion between college physicists and school physicists planning a course for advanced placement is: "Will a full program of advanced laboratory work be required?" The answer is "Yes," in terms of the time spent by the student and the quality of his experimental work; and "No," in terms of numbers of experiments and complexity of apparatus.

If the school course is to replace a college course satisfactorily, it must provide training and experience in independent laboratory work. Subsequent courses in college will expect both the skills and the attitudes of a good experimenter. These skills and attitudes, however, are not necessarily attained by working rapidly through many experiments or by using complex, expensive apparatus requiring profuse instructions. They are to be expected from careful experimenting, with plenty of time in which the student works on his own—with only general guidance from the teacher—facing and surmounting the difficulties he meets, learning by his own mistakes, and achieving success by his own repeated trials rather than by making prescribed measurements. He should finish each experiment to his own satisfaction, usually

ending with a critical analysis of its results. Thus a few experiments done carefully by a student working on his own with plenty of time for thorough work are worth more than many done rapidly. In general, the laboratory for Advanced Placement physics:

1. *Does need to give the student opportunity to do his own work, gaining skills and understanding by experience.* For example, an empirical investigation of the simple pendulum, spread over several sessions, can be very valuable in developing experimental skill, intelligent treatment and analysis of data, and awareness of second-order effects, as compared to a one-shot determination of "g." Quick, one-session experiments that follow detailed instructions and seem to verify approximate rules can do more harm than good.

2. *Does not need a lot of special or expensive apparatus.* A school that lacks the equipment and supporting staff that enable a college to offer complex experiments need not feel at a serious disadvantage. For example, a student's determination of the wavelength of light with homemade apparatus for producing Newton's rings may be as valuable as access to an expensive interferometer. A simple galvanometer with radio capacitor and resistor can provide as good (though perhaps not as topical) a study of exponential decay as a radioactive source with counter or electroscope.

3. *Does need full and adequate time.* In the corresponding one-year college course, students spend 45 to 90 hours (in two- or three-hour sessions) working with apparatus in the laboratory; colleges expect the equivalent contact in the school course. The additional time, outside the laboratory, spent in preparing for experiments by reading and in finishing experiments by writing reports varies greatly in college courses from practically zero to many hours per week. In the school course, such activities need not take much time. Long formal reports written outside the laboratory are less valuable than current records (similar to the notebook of a research scientist) with good data analyses; reports copied out for the sake of neatness should not be accepted.

It is the belief of the Committee of Examiners for Physics that the way in which the experiments are done matters more than the particular choice of experiments or the number completed in the course.

The committee feels that many experiments for which schools have equipment, or for which they can obtain equipment without excessive cost, can be turned to good use in an Advanced Placement course. Furthermore, federal and sometimes state funds are available for the purchase of equipment for new experiments.

It should be emphasized that the Advanced Placement teacher should feel free to be imaginative in the selection of laboratory experiments. It is very important that the laboratory be a meaningful learning experience, that it be an enjoyable experience, and that the student be given an opportunity to appreciate physics as an experimental science as well as to develop laboratory skills.

As a guide only, a list of possible experiments is given below. Many of these experiments could be used in either the Physics B or C course. However because of the limited coverage of the C course, the experiments in the C course will deal with fewer topics in greater depth than those in the B course.

Experiments Frequently Used in College Laboratories and Advanced Placement Physics Courses

Probability, error analysis, and graphical analysis study of a simple pendulum (dependence of T on amplitude, m , and L)
Precise measurement of "g" with a long pendulum, S.H.M. of an object hung on a spiral spring
Equilibrium of a rigid body
Angular momentum; for example, PSSC Advanced Topics
Torsion pendulum: measurements of mass and moment of inertia
Physical pendulum (measure moments of inertia)
Study of momentum and kinetic energy in two-body collisions
Centripetal force

Elongation of rubber or other elastomer under load (useful for work and energy concepts, as well as hysteresis and fallibility of parroted "law")

Measurement of mechanical equivalent of heat

Specific heat and heat of fusion

Potentiometer

Charge to mass ratio of electron

Measurements using an oscilloscope

Electric circuits

Experiments on electromagnetic induction

Optics, lenses

Measurement of wavelength of light by interferometric methods

Optical spectrometer and Balmer series

Radioactivity and counting experiments

Millikan's oil-drop experiment

Examinations Each Advanced Placement Examination in Physics is three hours in length and consists of one hour of multiple-choice questions and two hours of essay questions.

There will be two separate examinations. The B examination will closely parallel the Physics B course, and the C examination will closely parallel the Physics C course.

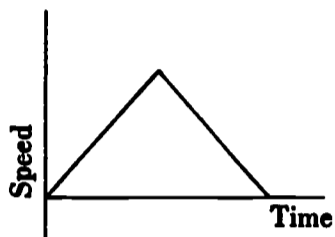
B examination

The following questions are illustrative of the B examination.

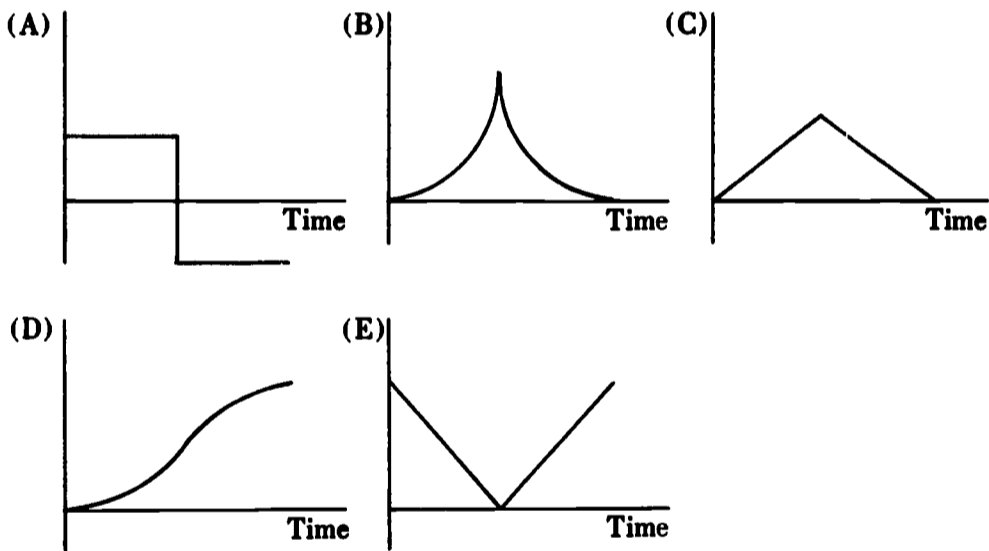
MULTIPLE-CHOICE QUESTIONS

1. According to the Bohr theory of the atom, which of the following occurs as an electron moves in an atom from an orbit of small radius to one of larger radius?
 - (A) The potential energy of the atom decreases.
 - (B) The angular momentum of the atom decreases.
 - (C) The tangential speed of the electron increases.
 - (D) The total energy of the atom increases.
 - (E) None of the above

Questions 2-4 relate to an automobile that makes a short trip along a straight line. The speed of the automobile as a function of time is shown in the graph below.

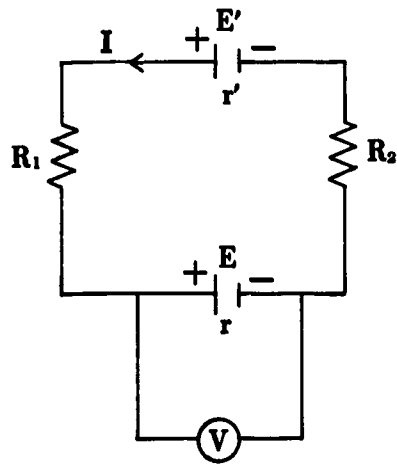


Five lettered graphs and three numbered phrases follow. For each numbered phrase select the one graph which most nearly represents the relationship described in the phrase. One graph may be used once, more than once, or not at all.



2. The momentum of the automobile as a function of time
3. The acceleration of the automobile as a function of time
4. The kinetic energy of the automobile as a function of time

5.

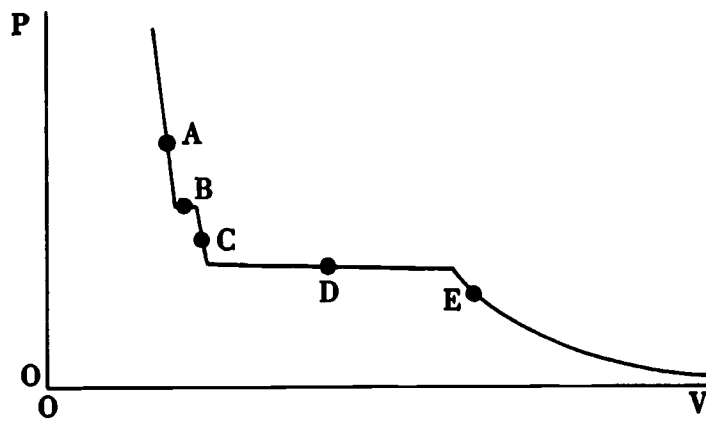


In the figure above, E and E' are the electromotive forces of two primary cells, and r and r' are the internal resistances of the cells. R_1 and R_2 are external resistances. I is the conventional positive current in the circuit with the direction shown. V is a voltmeter connected as shown. The voltmeter may read
 (A) Ir (B) $E - Ir$ (C) $Ir - E$ (D) $Ir + E$ (E) $I(R_1 - R_2)$

SHORT-ANSWER QUESTION

About 5 minutes

6.



An isothermal for a certain substance might look something like the curve on the PV diagram above. At each of the following points on the curve, the substance is in what state or states?

Point A: _____ Point B: _____ Point C: _____
 Point D: _____ Point E: _____

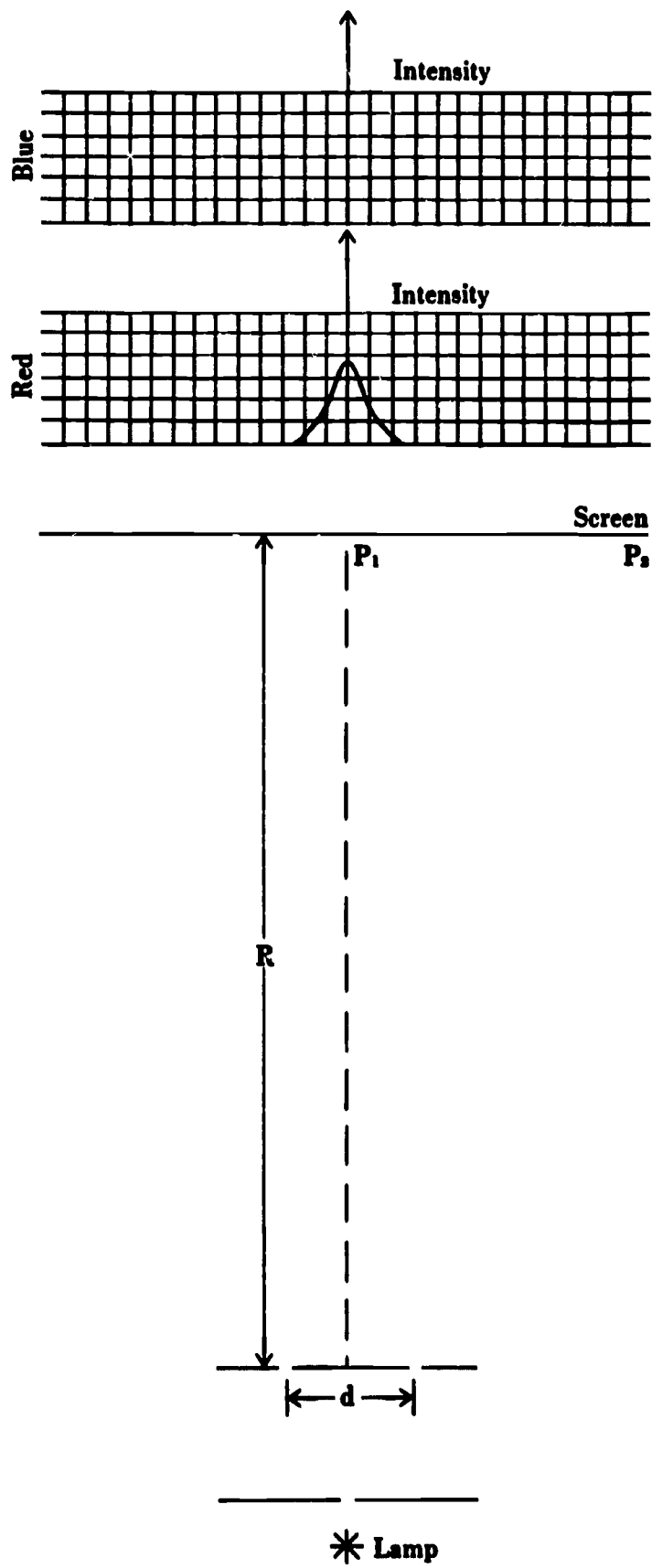
MAJOR ESSAYS

About 20 minutes each

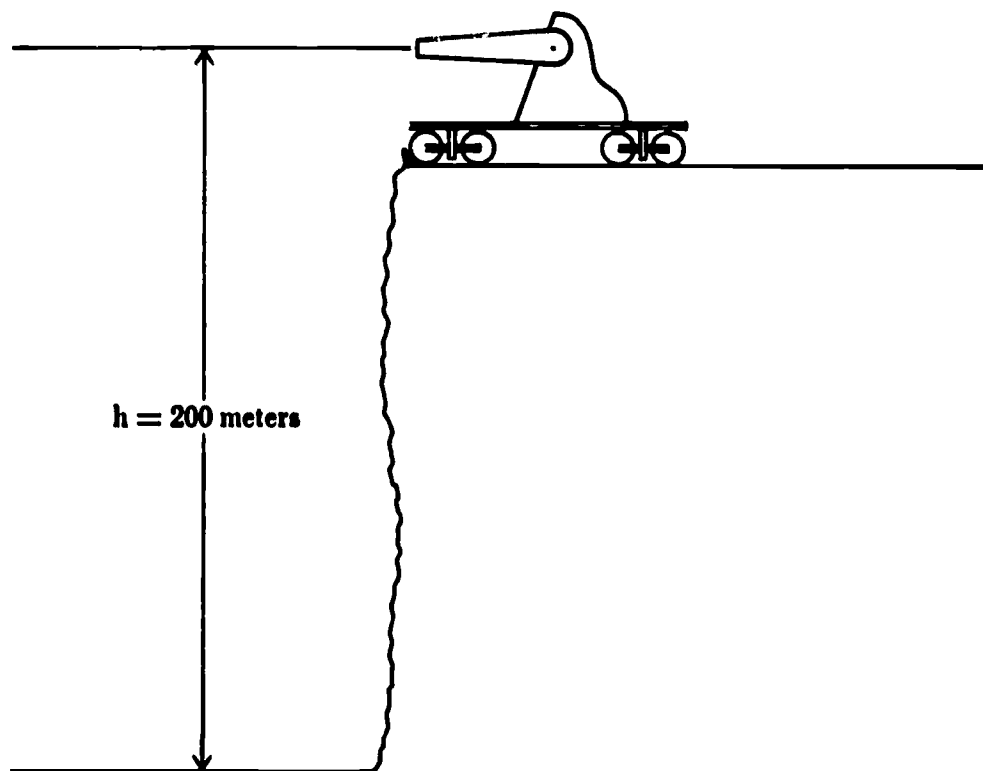
Be sure to show clearly the steps by which you arrive at answers. You will receive partial credit for correct steps even if the answer is incorrect. If you give only the answer with no explanation, you will receive little or no credit.

CREDIT FOR YOUR ANSWERS DEPENDS ON THE QUALITY OF YOUR EXPLANATIONS.

7. Two narrow, parallel slits are illuminated by a lamp through another slit, as shown. The two slits are separated by a distance d and the width of each slit is $0.1 d$. An interference pattern is observed on a screen at a distance R , ($R \gg d$), from the slits.
- (a) The interference pattern is at first made with monochromatic red light. On the appropriate grid above the diagram of the screen, sketch the continuation of the curve showing the intensity of illumination of the screen as a function of position.
 - (b) On the second grid show the pattern if the light is changed to monochromatic blue of the same intensity. Give the reason for differences in the pattern.
 - (c) Explain why there are several maxima and minima of illumination between points P_1 and P_2 . Use suitable diagrams to aid in your explanation.



8.



A cliff, approximately 200 meters high, connects two level flat regions as shown in the diagram above. On the upper surface there is a straight railroad track leading away from the edge of the cliff. Standing on the track, free to move, is a car upon which is mounted a gun; the axis of the gun is parallel to the track. The total mass of the car and gun is 20,000 kilograms. The gun fires a projectile that has a mass of 50 kilograms over the cliff with a velocity of 2,000 meters per second with respect to a frame of reference attached to the ground.

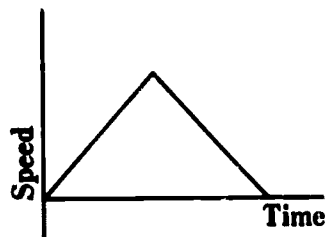
- (a) What is the speed of the car and gun with respect to the ground immediately after the projectile has left the gun?
- (b) When the car is moving on the track there is exerted on the car a frictional force whose value is 2 percent of the weight of the car and gun. How far does the car move from the point at which the projectile leaves the gun until the car comes to rest?

- (c) What horizontal distance measured from the point at which the projectile leaves the muzzle of the gun does the projectile move before striking the ground? (Disregard air resistance.)

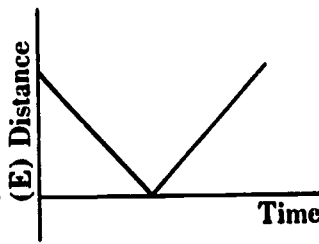
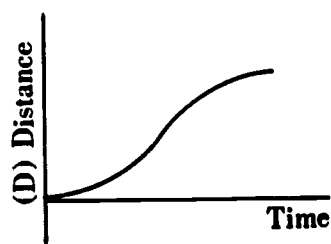
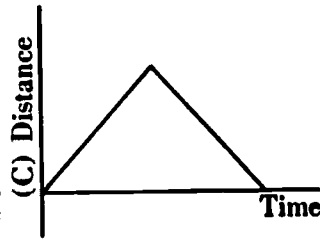
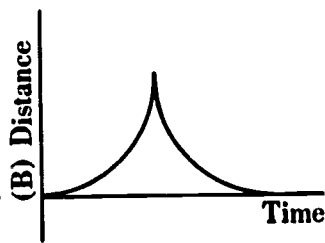
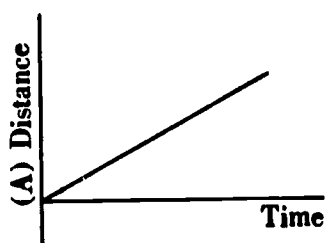
C examination

The following questions are illustrative of the C examination.

MULTIPLE-CHOICE QUESTIONS



1. An automobile makes a short trip along a straight line. The speed of the automobile as a function of time is shown by the graph above. Which of the following graphs best represents the distance traveled by the automobile as a function of time?



2. A flat circular coil of many turns of wire is held with its plane perpendicular to a uniform magnetic field \vec{B} . The terminals of the coil are connected across a resistance R . The coil is then moved at a speed v from its original position to a region where $\vec{B} = 0$. The total charge that moves through the circuit during this motion is
- (A) zero
 - (B) dependent on both v and R
 - (C) dependent on R , but independent of v
 - (D) dependent on v , but independent of R
 - (E) independent of both v and R
3. A 3,000-pound car moving 20 miles per hour due east hits a 4,000-pound truck moving 20 miles per hour due north, on an icy crossroad. The two lock together and skid with negligible friction. The speed of the combined wreck is approximately
- (A) 28.2 miles/hour
 - (B) 20 miles/hour
 - (C) 14.3 miles/hour
 - (D) 10 miles/hour
 - (E) 5.7 miles/hour

SHORT-ANSWER QUESTION

About 5 minutes

4. The law of gravitation may be stated thus, $F = \frac{GMm}{R^2}$

Show that a satellite of mass m moved from the surface of the earth (mass M and radius R_1) to a circular orbit (radius R_2) shows a gain of potential energy W given by

$$\Delta W = GMm \left(\frac{1}{R_1} - \frac{1}{R_2} \right).$$

MAJOR ESSAYS

About 20 minutes each

Be sure to show clearly the steps by which you arrive at answers. You will receive partial credit for correct steps even if the answer is incorrect. If you give only the answer with no explanation, you will receive little or no credit.

CREDIT FOR YOUR ANSWERS DEPENDS ON THE QUALITY OF YOUR EXPLANATIONS.

5. A horizontal plank oscillates horizontally in simple harmonic motion with a frequency of n vibrations per second and a small amplitude, A_0 .



A block of mass m that is placed on the plank moves with it.

- (a) Draw and label vectors representing the forces acting on the block when its displacement is

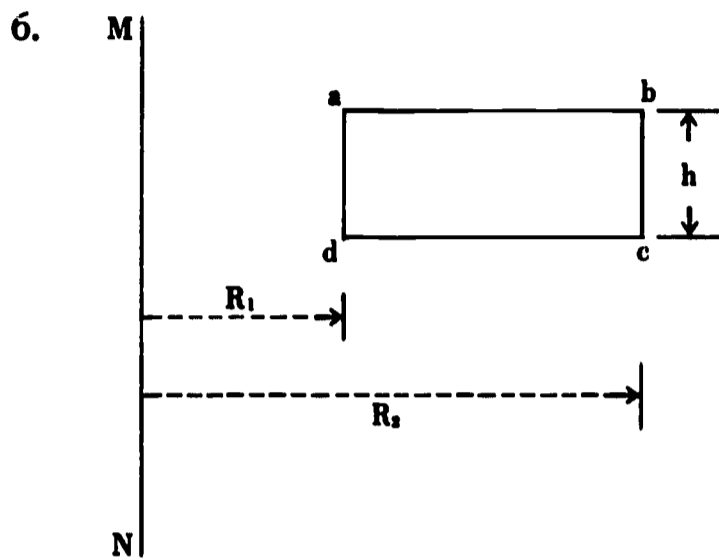
(i) Zero (middle of path)



(ii) $+\frac{A_0}{2}$ (halfway from center to right-hand end of path)



- (b) For motion with amplitude A_0 , find the maximum momentum and the maximum acceleration of the block.
- (c) The amplitude of the motion is then increased slowly and steadily (the frequency remaining constant) until at an amplitude A , the block begins to slip. Find this limiting value of A in terms of n , g (acceleration due to gravity) and μ , the coefficient of static friction between plank and block.



MN represents part of a long straight wire carrying an alternating current described by $i = I \sin \omega t$. A wire circuit, in the shape of a rectangle $abcd$, is located with its sides at distances R_1 and R_2 from the wire MN, as shown in the diagram. The sides ab and cd are perpendicular to the wire MN.

(a) Show that the magnetic field at a distance r from the wire is equal to $\frac{Ki}{r}$, where K is a constant.

(b) Show that the magnetic flux through the rectangular frame is $\phi = (Khi) \log_e \left(\frac{R_2}{R_1} \right)$.

(c) Faraday's law states that the induced electromotive force E in a circuit is equal to C times the time rate of change of flux where C is a proportionality constant. Using this law and the expression for the flux from part (b), show that in the rectangular loop

$$E = (ChKI\omega \cos \omega t) \log_e \left(\frac{R_2}{R_1} \right).$$

(d) What would be the effect upon the induced electromotive force and the current in the rectangular wire if its resistance were increased?

**ANSWER KEY TO MULTIPLE-CHOICE
QUESTIONS, PHYSICS**

B EXAMINATION

1-D, 2-C, 3-A, 4-B, 5-D

C EXAMINATION

1-D, 2-C, 3-C

SPANISH



To be eligible for a course in preparation for the Advanced Placement Examination in Spanish, the student should have a basic knowledge of the language and culture of the Spanish-speaking peoples. He should have attained proficiency in listening comprehension, speaking, reading, and writing. He should be able to read modern Spanish of moderate difficulty without the aid of a dictionary and, using a dictionary, be able to read any given selection from classical or modern Hispanic literature. Finally, he should be prepared, through the study of selected works of acknowledged literary value (see the lists of authors on pages 185-186), to appreciate and discuss varied aspects of expression, such as style, imagery, and structure.

Course

To be eligible for advanced placement and credit in college, the student is expected to have completed the equivalent of work required in a one-year college course in the introduction to literature that covers selected works from the literatures of Spain and Spanish America. The function of such an advanced course in the school program, as well as in college, is to direct the student toward appreciation of content and perception of literary values. It is *not* conceived as a survey course of the entire field of either Spanish or Spanish-American literature. It is, however, recommended that representative readings be selected from several different genres (novel, essay, short story, drama, and poetry).

Reading list

In preparation for the examination, candidates should familiarize themselves with representative works of *six* writers from the following list:

Alarcón, Pedro A. de	*Darío, Rubén
Azuela, Mariano	Gallegos, Rómulo
Baroja, Pío	García Lorca, Federico
*Benavente, Jacinto	Pérez Galdós, Benito
Blasco-Ibáñez, Vicente	Unamuno, Miguel de

This list has been selected to establish a standard basis for examination and, at the same time, to provide the student with experience in depth and a reasonable spread across the chief literary currents of modern times.

In choosing six authors from the list above, the teacher should include at least two Spanish-American authors. These six authors should be studied in some depth, without undue concentration within a single literary period. At least one major work by each of these authors should be studied in detail, together with samplings of the writer's shorter works. This can be accomplished in part by supervised independent reading.

Reading in breadth should be developed by reading additional works from the first list, by reading authors from the supplementary list below, or by reading from both lists. Altogether, ten authors should be covered. In selecting authors from the following list, teachers should make sure that those chosen represent a variety of genres and historical periods.

Alegría, Ciro	Casona, Alejandro
Bécquer, Gustavo Adolfo	Cela, Camilo José
Buero Vallejo, Antonio	Delibes, Miguel

*Note that Jacinto Benavente and Rubén Darío now appear on the list of required authors, and Alejandro Casona and Rodolfo Usigli, on the supplementary list. Questions based on the writings of Benavente and Darío will first appear in the May 1969 Advanced Placement Examination in Spanish.

Fuentes, Carlos	Ortega y Gasset, José
Güiraldes, Ricardo	Palma, Ricardo
Guzmán, Martín Luis	Paz, Octavio
Hernández, José	Pérez de Ayala, Ramón
Jiménez, Juan Ramón	Quiroga, Elena
Machado, Antonio	Quiroga, Horacio
Martí, José	Rivera, Jose Eustasio
Martínez Ruiz, José (Azorín)	Rojas, Manuel
Matute, Ana María	Usigli, Rodolfo
Neruda, Pablo	Yáñez, Agustín

Obviously, there are many authors of merit not included in the second list, and teachers should feel free to make substitutions, provided they are at the literary level of the list as a whole.

Although all authors appearing on both lists belong to the nineteenth and twentieth centuries, the reading of works by authors of other periods, particularly the Golden Age, is strongly recommended. By requiring the reading of specific authors, the committee provides, to some extent, a common core of literary experience and feels that thereby a better examination can be written. The committee regularly reviews the reading lists and occasional changes are made.

Examination

The examination tests the following areas of the student's competence: comprehension of spoken Spanish, comprehension of texts in prose and verse, skill in writing expository and critical prose, and literary interpretation and analysis. Students are not permitted to use dictionaries or other reference works during the examination.

The approximate format of the examination is indicated below; sample questions and instructions are provided for all parts of the examination except the section that tests listening comprehension. The sample questions appearing here were drawn from a complete examination that was published as part of an article on Advanced Placement Spanish by John E. Englekirk,

chairman of the Spanish Advanced Placement Committee of Examiners, in the September 1967 issue of *Hispania*. A tape recording of the lecture included in that examination and a reprint of the article are available from: College Board Advanced Placement Examinations, Box 977, Princeton, New Jersey 08540. The cost of the tape recording is \$6. Sets of five copies of essay questions from the most recently administered Spanish examination are also available from: College Entrance Examination Board, Publications Order Office, Box 592, Princeton, New Jersey 08540. The cost of each set of five copies is \$1. Teachers of Advanced Placement Spanish may also be interested in the article *New Developments in the Spanish Advanced Placement Program of the College Entrance Examination Board* by Albert R. Turner, in the May 1967 issue of *Hispania*.

Section I

The student will listen to and take notes on a tape-recorded lecture in Spanish of approximately 12 minutes in length. The lecture will deal with a Hispanic cultural or literary subject. The student will then be asked to answer 15 to 20 multiple-choice questions based on the content of the lecture.

Section II

PART A

Time—50 minutes

In this part the student is asked to read two poems and answer a series of questions about them. He may write in English or in Spanish.

Instrucciones: Lea Ud. con cuidado estos dos poemas. Luego, conteste-en el idioma en que Ud. mejor pueda expresarse (español o inglés)-a las cinco preguntas. No tendrá Ud. ninguna ventaja por escribir en español.

Viento

Cantan las hojas,
bailan las peras en el peral;
gira la rosa,
rosa del viento, no del rósal.
Nubes y nubes
flotan dormidas, algas del aire;
todo el espacio
gira con ellas, fuerza de nadie.
Todo es espacio;
vibra la vara de la amapola
y una desnuda
vuela en el viento lomo de ola.
Nada soy yo,
cuerpo que flota, luz, oleaje;
todo es del viento
y el viento es aire siempre de viaje.

Amanecer de otoño

Una larga carretera
entre grises peñascales
y alguna humilde pradera
donde pacen negros toros. Zarzas, malezas, jarales.

Está la tierra mojada
por las gotas de rocío,
y la alameda dorada,
hacia la curva del río.

Tras los montes de violeta
quebrado el primer albor.
A la espalda la escopeta,
entre sus galgos agudos, caminando un cazador.

Las preguntas números 1 y 2 se refieren al poema "Viento";
las preguntas 3 y 4 al poema "Amanecer de otoño"; y la pregunta
número 5 trata de establecer una comparación entre los dos.

1. ¿Cuáles son los efectos del viento que describe el poeta en "Viento"?
2. ¿Cuál es la relación entre el poeta y el viento en el mismo poema?
3. ¿Qué indicios emplea el autor para establecer la hora del amanecer en "Amanecer de otoño"?
4. ¿Qué colores emplea el poeta y para qué efecto en "Amanecer de otoño"?
5. Compare o contraste los dos poemas teniendo en cuenta, por ejemplo, versificación (características formales como métrica, forma de estrofa, etc.), imágenes y efectos sensoriales, presencia del poeta, importancia de pensamiento o sentimiento, etc.

PART B

Time—75 minutes

Ten reading selections, one for each author on the required reading list, appear in this part. The student is instructed to choose a specific number of selections. After reading each one he will answer, in Spanish, the two accompanying questions.

Instrucciones: Escoja cuatro selecciones de las diez que siguen y conteste—*en español*—a las preguntas correspondientes.

Benito Pérez Galdós

Era doña Sales señora muy mirada, muy atenta a las conveniencias sociales, cuidadosísima de su persona, obedeciendo a cierta presunción decorosa, que más valiera llamar decencia. Aunque se estuviera muriendo, no se presentaba nunca al médico desgreñada y a medio arreglar. Según ella, si se viste a los cadáveres, también deben vestirse los enfermos. En esto era la señora la misma pulcritud, el decoro personificado, y aquella

tarde de la consulta, considerando ésta como un acto de etiqueta en las relaciones del enfermo con la sociedad, se hizo peinar con exquisito esmero sus cabellos blancos, en *bandós*;¹ se puso el corsé, prenda que no abandonaba sino cuando le era imposible soportarle, y la *bata*² de las solemnidades, de *raso*³ negra con listas blancas. Antes aguantaría sin chistar los mayores dolores y molestias, que presentarse en facha innoble delante de personas extrañas. El día que le dieron el *Viático*,⁴ se peinó de la misma manera, porque si rendía tributo a la idea religiosa, también *acataba*⁵ la sociedad y la ciencia, dando al César lo que del César es. Hallábase, pues, como he dicho, sentada en su sillón, muy tiesa, muy aseñorada, muy convencida de que lo enfermo no quita lo decoroso, y de que debemos padecer y morirnos con las formalidades correspondientes a la clase a que pertenecemos.

1 *bandós*: braids

2 *bata*: housecoat

3 *raso*: a type of silk

4 *Viático*: part of the Last Rites of the Roman Catholic Church

5 *acatar*: to revere

1. Señale, comente y relacione los elementos realistas y humorísticos de que se vale el autor para darnos la imagen de doña Sales.
2. Compare a doña Sales con otro personaje galdosiano que en algo se le parezca.

PART C

Time—30 minutes

The student is asked to write a composition in Spanish of approximately 200 words on the indicated topic.

Instrucciones: Escriba Ud. *en español* un ensayo sobre el tema indicado:

“La tragedia surge del choque entre el hombre y alguna fuerza que no puede dominar; de hecho, no gira en torno a caprichos o accidentes triviales.”

Comente las reacciones de dos personajes en situaciones trágicas, refiriéndose a dos obras de autores cuyas selecciones NO han sido elegidas por Ud. en “SECTION II, PART B.”