**AP Physics 12 B**



FORMAT OF THE EXAMINATIONS

* The Physics B examination is three hours long and is divided equally in time between a 70-question multiple-choice section and a free-response section.
* The two sections are weighted equally, and a single grade is reported for the B exam.
* The free-response section will normally contain six to seven questions. Typical examples of its format are six questions, each taking about 15 minutes, or four questions of about 15 minutes each and three shorter questions of about 10 minutes each.

TEST-TAKING STRATEGIES

It's natural to be anxious when you are about to do something on which others will judge your performance. The greatest anxiety moderator for most people is knowledge; the more you know in advance about a course or an exam, the better you can moderate your fears. Knowing about an exam means understanding what kinds of questions you will be asked, how the exam will be graded, how much time you'll have to respond, and so on. Knowing that you are prepared in terms of the exam's content is probably the most calming knowledge of all. Consistent study and review throughout the course is a powerful reliever of excessive tension both for daily classroom learning and for tests.

Directions

Be aware that not paying enough attention to directions on tests can adversely affect your grade. On the AP Exams, phrases in the multiple-choice sections like "All the following are . . . EXCEPT" or "Which of the following does NOT . . ." contain critical words. If you don't pay attention to them, you will not respond correctly to the questions.

There are also special directions in parts of the free-response questions. For example, there may be directions that specify for you to explain what principles to use in deriving an expression or directions that ask you to express an answer using specific variables.

Time Limits

Make a quick estimate of the amount of time the various questions or sections of a test will require, stay aware of the time available throughout the test, and concentrate on questions they can respond to best. Move on to the next question if you can't figure out the answer to the one you are working on.

In the free-response questions, the number of points for the question is specified after the question number. The number of points indicate the weighting of the questions in the grading and are approximately equal to the time that should be spent answering them for those who want to pace themselves to finish in the given time limit. Use all the time available to complete the exam. If you finish the exam with time to spare, go back to questions you skipped or answers that you can supplement. Check the directions again to be sure you've responded properly.

SUGGESTIONS FOR THE MULTIPLE-CHOICE SECTION

Answer Sheets

One of the common mistakes while filling the answers of the multiple-choice section is getting responses out of sequence; for instance, marking an answer for question 5 when the answer was intended for question 6. This can happen easily when you skip a question, put a mark in your test book (not on your answer sheet) when you do this.

Frequently check to be sure that the number of the question on your answer sheet corresponds to the number of the question in your exam booklet.

Answering Questions

Total scores on the multiple-choice section will be based on the number of questions answered correctly. Points will no longer be deducted for incorrect answers and, as always, no points will be awarded for unanswered questions.

Eliminating Incorrect Responses

Multiple-choice questions are often very short problems with a choice of answers that require a short calculation or derivation. However, you can use the following tips to determine the answer more quickly or to eliminate choices that are incorrect:

\* In some questions with numerical answers, the choices may differ by several orders of magnitude so that the questions can be answered by estimation rather than by exact calculation. You are encouraged to develop your skills in making order-of-magnitude calculations to estimate such answers more rapidly.

\* Recognizing that some choices are physically unreasonable or unlikely is often a good way to narrow the possibilities for the correct answer. For example, if you are asked to calculate the time it takes for a ball to fall from the top of a house, you could immediately eliminate answers of 0.01 second or 100 seconds, since they are outside the range of physically likely possibilities.

\* Some questions may ask you to derive an expression in symbolic form rather than to calculate a numerical value. If you have trouble determining the correct expression, you might try checking the units of each choice. Those that do not have the units expected of the answer can be eliminated. For example, if you are to determine an expression for a distance, then an answer such as *2v/t*, where v is speed and t is time, would have the units of distance divided by time squared, and would therefore be dimensionally incorrect.

\* For questions that give expressions in algebraic form, you might also look at limiting cases; that is, at what would happen to the expressions if one of the variables were very large or very small. If an expression predicts a result that could not be reasonably expected or that is physically impossible, then that choice can be eliminated as the correct answer. For example, the expression *6 + 2t*could not be correct for the speed of a ball released from rest at time *t* equal to zero, since it does not go to zero as *t* goes to zero.



SUGGESTIONS FOR THE FREE-RESPONSE SECTION

Before beginning to solve the free-response questions consider reading all the questions to determine which ones you feel best prepared to answer. Then you can   solve the questions in the order that will allow you to perform your best.

You should show your work for each part of a question in the space provided after that part, and if you need more space you should clearly indicate where you are continuing your work. You will NOT receive credit if the grader cannot tell which part of the question you are answering.

Show all your work. Partial credit is given for partial solutions to problems. If you do not show your work, you may receive full credit for an answer if it is correct, but you take a big risk because credit is often based not just on the presence of the right answer but    on the correct use of appropriate steps leading to the right answer. If the answer is not correct, you are not likely to receive credit for correct thinking if the person scoring your examination does not see evidence of this process on paper. If you do work that you think is incorrect, you should simply put an "X" through it, instead of spending time erasing it completely. Crossed-out work will not be graded, and credit may be lost for incorrect work that is not crossed out.

Organize your answers as clearly and neatly as possible. Credit for your answers depends on your demonstrating that you know which physical principles can be applied in solving a particular problem, and an organized answer in the appropriate answer space will better allow the grader to determine whether you have demonstrated such knowledge. Also, show the steps in your solution. If the grader cannot easily follow     your reasoning, you are less likely to receive credit for it.

The free-response questions on an AP Physics examination are usually divided into parts such as (a), (b), (c), and (d), with each part calling for a different response. Credit for each part is awarded independently, so you should attempt to solve each part. For example, you may receive no credit for your answer to part (a), but still receive full credit for parts (b), (c), or (d). If the answer to a later part of a question depends on the answer to an earlier part, you may still be able to receive full credit for the later part, even if that earlier answer is wrong. The grade will depend on your method of approach to the later part and on the consistency of your answer with that of the earlier part.

You will sometimes be asked to justify your answer to a free-response question. This indicates that the person scoring your answer is looking for some analysis that will show how you derived your answer and prove that your answer must be correct.

It is not necessary to simplify all numerical expressions or carry out all numerical calculations. Pay attention to units for quantities that have them. Keeping track of units as you do calculations can help you make sure that your answers are expressed in terms of the proper units. You can lose points if the units are wrong or are missing from your answers.

Do NOT write down a bunch of equations with the hope that the correct one will be among them so you can get some partial credit. With the equation sheets available, this approach is not likely to reward you with partial credit, and you might lose points for giving extraneous or incorrect information.

