

LAB TEST 2003

Announcement 2 and list of experiments to be used in the lab test

SCHEDULE: Your test will take place within periods:

Monday April 7, Tuesday April 8, Wednesday April 9:

2:00 to 2:50 p.m.

3:15 to 4:05 p.m.

4:30 to 5:20 p.m.

Thursday April 10, Friday April 11:

1:00 to 1:50 p.m.

2:15 to 3:05 p.m.

3:30 to 4:20 p.m. Thursday only!

Wednesday April 9 - evening:

6:00 to 6:50 p.m.

The time at which the test for your group will take place will be posted on this web site, and also on the boards outside the lab rooms on the day of the test, in the morning.

EXPERIMENTS You will be asked to take a set of measurements on a modification of one of the experiments which you have already done during the course. The apparatus you will use will be similar to one you have already used and the measurements you will take will be similar to, but not necessarily the same as, those you made when you performed the experiment. In each case you will be asked to take up to five measurements of two related quantities, and to plot the resultant data on a straight-line graph.

The experiments that will be used in the test are the following:

[BOYLE'S LAW](#)

[DC CIRCUITS I](#)

[FREEFALL](#)

LENS OPTICS

VELOCITY OF SOUND IN A GAS

VELOCITY OF SOUND IN A SOLID

STANDING WAVES

SPECTRA

SUGGESTED PREPARATION:

Spend a little time before the day of the test to review the experiments you may be tested on; convince yourself that you know how to take measurements, and try to understand the possible uncertainties (errors). Think through a strategy for taking the measurements in the quickest and most efficient way. Make a guess of the measurements you might be asked to take, and consider how you might graph the measurements; decide which variable will be on your y- and which on your x- axes, what will be the units and the range of each axis, and how you will extract the information requested.

TIMES: Check the lab test schedule posted on this web page and also ON THE BOARDS outside the lab rooms to find out the time of your test. Make sure that you know what lab group you are in and what time your test is WELL BEFORE the day of your test! You should be in the corridor in front of MP125 and MP126 at least ten minutes before the time posted for your test. The specific experiment to which you are assigned and the room in which it is found will be posted outside rooms MP125 and MP126 about 20 minutes before the test is scheduled to begin. You will be allowed into the room at the posted times, and the test will start as soon as everyone is seated.

WHAT TO BRING: Bring only your STUDENT CARD, a PEN, a PENCIL, and a CALCULATOR (non-programmable) - everything else that you need will be provided. No books or coats or pieces of paper will be allowed near your work area.

THE TEST:

During the Test: Immediately after you have found the apparatus you have been assigned to, write your name, student number, and lab group number on the examination booklet AND the graph paper. Demonstrators have been instructed NOT to answer student questions. If you must talk to a faculty member, raise your hand, and one of us will come over to you. After 45 minutes you will be asked to stop working immediately and leave the room to allow the next test to begin.

Marking: Two demonstrators will supervise the work of each dozen or so students. They will be responsible for giving you a mark for the test. They will be provided with a Marksheet on which they will give you a mark for the following three categories:

- Set up
- Doing the experiment

- Data analysis (record/graph/errors)

The first two categories will be evaluated on the basis of the demonstrators' observation of your work in the lab. **After half an hour has passed, they will approach you and ask you to quickly explain what you are doing, and to show them how you have taken one of the measurements.** The third category will be evaluated after the test on the evidence of your written work in the examination booklet and the graph.

SUGGESTED STRATEGIES DATA TAKING: The time allocated is very short; plan to take the data as quickly as is consistent with reasonable accuracy. In practice this means that you will not generally have any time to repeat measurements, except perhaps to help you estimate a reading error, or in the (hopefully rare) cases in which you believe that you have made a mistake. In no case should this stage take more than 25 minutes (and 20 minutes is better!), as you will need at least 20 minutes to analyze and plot your data. It is more important that you get a few points plotted than that you complete all of the measurements suggested. Remember to quote units throughout; where appropriate use S.I. units in your final result.

GRAPHS: Your graph should have the axes labeled with the name of the variable being plotted, along with its units. The calculation of the quantity to be extracted (e.g. the slope) can be done on the graph itself. If the errors in individual readings are large enough, these should be indicated by error bars on your plot (but see note below on ERRORS) and there should be an indication of the "extreme" lines from which you estimate the error in the extracted quantity. If one of the points doesn't fit your line or curve, it is advisable to repeat that measurement (time permitting). **ERRORS:** Your error analysis should include an estimate of the error in individual readings, also indicated on the graph if possible, and an estimate of the error in the quantity extracted from your plot of these readings (e.g. the slope of a line). In almost every case the error can be estimated from "common sense" arguments with little or no actual calculation; in no case is it required that you calculate a true standard error (there isn't time!). **NOTE:** Although you will certainly be given credit for your error analysis, it is much less important than taking the data and plotting the graph - so leave it till last whenever possible.