The purpose of the laboratory report is to convey your measurement results in a clear and concise manner without missing the key points of the experiment. Collect all your thoughts before writing. Long reports are not favored. The following format will be strictly enforced. Any deviation of the format will result in deduction of points. Do NOT submit your own flavor of the report. For example no theory section is needed for the report. This is a lab class and the emphasis will be on how one correlates the experimental results to the theoretical values (which we assume you already know and worked out in the PRELAB). There will be 7 experiments in the quarter, and you are required to submit a report for each experiment. Each experiment may have several subexperiments. For example experiment #1 has five subexperiments numbered I-V. For a complete report example look at the end of this report.

Lab Report Format (5 points):

Each lab report must have one signed PRELAB section, as many title, introduction, procedure, results, discussion, and conclusions as the number of subexperiments and finally an appendix which includes all the signed data sheets used during the experiment to collect the raw data.

Here are detailed instructions for each section of a Lab Report:

Each experiment MUST have a section called PRELAB.

PRELAB (15 points):

The PRELAB consists of the required calculations in the preparation for each subexperiment. It must be completed before each laboratory experiment. It will be signed by the TA during the lab. No unsigned pages are allowed in the PRELAB. All of the expected (or theoretical) results are calculated in the PRELAB section. It is very essential to have calculated all the numerical results in the PRELAB so that you have an idea what to expect of the measurement results during the experiment. The final version of the PRELAB should be handed in as a separate section with the final report.

Each subexperiment MUST have the following sections:

Title (3 points):

The subexperiment title. For example in experiment #1 for the 3rd subexperiment it could be:

"III. Junction Capacitance".

And for the fourth subexperiment

"IV. Etc...... "

And so on.

Introduction (3 points):

This is a two to three sentences to describe the goal of the subexperiment.
Procedure (5 points):

This section **Must** have a figure which describes your experimental setup. Component values if appropriate should be included (e.g. Resistor values) on the figure. In this section you describe **how** you measured your results. **Do NOT repeat the procedure in the lab manual.** Only clarify if you deviated from the instruction and explain why.

Results (8 points):

In this section **only the processed data** will be presented. All the raw data collected during the experiment should be in an appendix at the end of the report and **NOT** included in the main report. Following must be **strictly** followed for the proper presentation of the results:

1. All numerical results **MUST** be tabulated in a table as follows:

<table>
<thead>
<tr>
<th>Measured result</th>
<th>Expected result</th>
<th>% error</th>
</tr>
</thead>
<tbody>
<tr>
<td>From experiment</td>
<td>From PRELAB calculations</td>
<td>100*(Meas.-Exp.)/Exp.</td>
</tr>
</tbody>
</table>

   The measured result could be a derived quantity. Therefore all the formulas used to derive the result must be included in this section. For example you may measure the -3dB frequency and from that you find the diode capacitance. Your measured result would be the diode capacitance. However, you must include the formula and the numbers that was plugged into it to show how you calculated the diode capacitance from the -3-dB frequency. The expected result **MUST** be from your PRELAB theoretical calculations.

2. **All** key measured plots which have been recorded during the experiment **MUST** be redrawn nicely with key features labeled on the figure. The key features are: Axis name and unit, amplitude of the signal, duration of the signal, and an appropriate label for the figure.

3. **Units** are absolutely necessary for every measured quantity in your report. Any measurement without a unit is meaningless.

Discussion (11 points):

*This is the most important part of your report.* In this section you will explain why there is a discrepancy between the expected (or theoretical) results which you obtained from the PRELAB calculations and the measured results. You have to analyze the data and explain sources of error. Error sources **MUST** be realistic and they are usually related to your measurement set-up. Remember, the theory is always correct and the experiments are chosen such that you should be able to verify the theory. However, usually, the equipment used in the lab has non-idealities that we usually do not account for in theoretical analysis. Your job is to find these non-idealities and explain the discrepancies.
Conclusions (5 points):

In this section you will summarize the key results in your subexperiment. The key results MUST be either boxed or highlighted using boldface fonts. Do not forget units for all parameters. If you were not able to do part of the experiment, explain why. Also, let us know how the experiment can be improved.

Appendix:

This will be the last part of the report and only includes the signed data sheets you used during the lab to collect the raw data.

Again:
In conclusion, each lab report must have one signed PRELAB section, as many title, introduction, procedure, results, discussion, and conclusions as the number of subexperiments and finally an appendix which includes all the signed data sheets used during the experiment to collect the raw data.

For EXAMPLE the first lab report should have the following order and format:

1. Cover sheet with experiment number (here experiment #1). Should include following info:
   Title of the experiment. Your name, email, and student ID number. Your lab section number.
   Your lab partner name and finally the date you performed the experiment.
2. Title for the subexperiment #1 (here I. Diode Forward Characteristic)
3. Procedure for the subexperiment #1
4. Results for the subexperiment #1
5. Discussion for the subexperiment #1
6. Conclusions for the subexperiment #1
7. Title for the sub experiment #2 (here II. Diode Reverse Characteristic)
8. Procedure for the subexperiment #2
9. Results for the sub experiment #2
10. Discussion for the sub experiment #2
11. Conclusions for the sub experiment #2
12. Title for the subexperiment #3 (here III. Junction Capacitance)
13. Procedure for the subexperiment #3
14. Results for the subexperiment #3
15. Discussion for the sub experiment #3
16. Conclusions for the sub experiment #3
17. Title for the subexperiment #4 (here IV. Diode Rectifier Circuits)
18. Procedure for the subexperiment #4
19. Results for the sub experiment #4
20. Discussion for the subexperiment #4
21. Conclusions for the subexperiment #4
22. Title for the subexperiment #5 (here V. Diode Rectifier Circuits with a Capacitor)
23. Procedure for the subexperiment #5
24. Results for the sub experiment #5
25. Discussion for the subexperiment #5
26. Conclusions for the subexperiment #5
27. Appendix which includes signed raw data from all four subexperiments
28. PRELAB the final signed version.