Part I – Design and Construction of the Experiment (66 pts)

A. Statement of the Problem (2 pts)
2 1 0 Statement addresses the experiment including variables (Not a yes/no question)

B. Hypothesis (6 pts)
2 1 0 Statement predicts a relationship between the independent and dependent variables
2 1 0 Statement gives specific direction to the prediction(s) (i.e., a stand is taken)
2 1 0 A rationale is given for the hypothesis.

C. Variables (20 pts)

a. Independent (IV) & Dependent (DV) Variable (12 pts)
4 3 2 1 0 IV Correctly identified and defined
4 3 2 1 0 Levels of IV given
4 3 2 1 0 DV Correctly identified and defined

b. Controlled Variables (CV) & Constants (8 pts)
2 1 0 First CV correctly identified
2 1 0 Second CV correctly identified
2 1 0 First Constant correctly identified
2 1 0 Second Constant correctly identified

D. Experimental Control (Standard of Comparison) (4 pts)
2 1 0 SOC logically identified for the experiment
2 1 0 Reason given for selection of SOC

E. Materials (4 pts)
2 1 0 All materials are listed and quantified
2 1 0 No extra materials are listed

F. Procedure and Set-up Diagrams (14 pts)
2 1 0 Procedure is presented in list form
2 1 0 Procedure is in a logical sequence
2 1 0 Steps for repeated trials are included
2 1 0 Multiple diagrams of setup are provided
2 1 0 All diagrams are appropriately labeled
4 3 2 1 0 Procedure detailed enough to repeat experiment accurately

G. Qualitative Observations (6 pts)
2 1 0 Observations about procedure provided
2 1 0 Observations about the results provided
2 1 0 Observations given throughout the course of the experiment

H. Quantitative Data - Data Table (10 pts)
2 1 0 All raw data is provided
2 1 0 Condensed data table with only the data to be graphed is provided
2 1 0 Tables and columns labeled properly
2 1 0 All data has units
2 1 0 Example calculations for derived variables are given

Part II – Data, Analysis and Conclusions (94 pts)

I. Graph (12 pts)
4 3 2 1 0 Appropriate Graph is provided
4 3 2 1 0 Graph properly titled and labeled
4 3 2 1 0 Appropriate scale and units included

J. Statistics (14 pts)
4 3 2 1 0 Statistics of Central Tendency used (i.e., best fit, median, mode, mean)
4 3 2 1 0 One example calculation is given for each statistic with units
4 3 2 1 0 Statistics of variation are included (i.e., minimum, maximum, range, standard deviation)
2 1 0 Calculations are accurate

K. Significant Figures (12 pts)
4 3 2 1 0 Data is reported using correct significant figures
4 3 2 1 0 Graph completed using correct significant figures
4 3 2 1 0 Statistics are reported using correct significant figures

L. Analysis of Claim/Evidence/Reason (CER) (18 pts)
2 1 0 Statistics Claim completed logically
2 1 0 Statistics Evidence completed logically
2 1 0 Statistics Reasoning completed logically
2 1 0 Outliers Claim completed logically
2 1 0 Outliers Evidence completed logically
2 1 0 Outliers Reasoning completed logically
2 1 0 Data Trend Claim completed logically
2 1 0 Data Trend Evidence completed logically
2 1 0 Data Trend Reasoning completed logically

M. Possible Experimental Errors (8 pts)
4 3 2 1 0 One specific error is identified and effect on results discussed.
4 3 2 1 0 Second specific error is identified and effect on results discussed.

N. Conclusion (8 pts)
2 1 0 Hypothesis is re-stated
2 1 0 Hypothesis Claim completed logically
2 1 0 Hypothesis Evidence completed logically
2 1 0 Hypothesis Reasoning completed logically

O. Applications & Recommendations for Further Use (6 pts)
2 1 0 Suggestions to improve the experiment given
2 1 0 Suggestions for practical applications of experiment are given
2 1 0 Suggestions for future experiments are given

***Continued on back***
P. Abstract (16 pts)

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<td>Brief and well-organized</td>
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<td>Contains the Statement of the Problem and Hypothesis</td>
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<td>Describes the research procedure</td>
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<td>Includes major findings and conclusion</td>
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School: ____________________________ Team# __________

Point Total: _______/160

Deduction multiplier(s): ________________
Non-clean up (0.95), Off topic (0.75), or Non-lab (0.25)

Final Score: ________________