PHTN1432 Lab Marking Scheme
Lab #1: Gas Discharge Tubes (2010W)

Name: ________________________

_____ / 30 Total      (- _____ % late = _____ /30)

__/2 Abstract
   ___ Why this was experiment done
   ___ How it was done
   ___ Basic observations (summarize important numbers, key pressures)

__/3 Background (Intro)
   ___ Basic configuration of the vacuum system
   ___ Diagram required (as per lab instructions)
   ___ The operation of a turbomolecular pump
   ___ Diagram required (as per lab instructions)
   ___ The concept of gas discharges at low pressures

__/4 Procedure
   ___ Pumpdown procedure
   ___ Gas Fill / Pressure adjustment procedure (valves)
   ___ Relevant figures/pressures included
      (e.g. "… tube was pumped to 1.3*10⁻⁵ torr …before admitting gas")
   ___ Enough detail to reproduce the experiment precisely
   ___ (-1) Verbose or simple Cut/Paste descriptions directly from lab outline

__/16 Observations
[2]   ___ Qualitative Effect of pressure on the air discharge (shape, size, discs)
      ___ Drawings of observations of the tube w/explanation
      ___ Min/Max pressures for discharge identified
[2]   ___ Calibration procedure
      ___ Key Hg lines used, error determined
      ___ Error correction applied to all further wavelengths
[2]   ___ ID of spectral lines in air (a table of observed lines)
      ___ Key N₂, O₂ lines identified (by wavelength)
      ___ OO Spectrometer output included
[3]   ___ ID of lines in the helium discharge (table)
      ___ Contaminants identified (lines not from helium)
      ___ Reasonable source for contaminants
      ___ OO Spectrometer output included
[1]   ___ Qualitative Effect of pressure in helium on sharpness of lines
[3]   ___ ID of lines in the neon discharge (table)
      ___ Contaminants identified (lines not from neon)
      ___ Reasonable source for contaminants
      ___ OO Spectrometer output included
[1]   ___ Qualitative Effect of pressure in neon on sharpness of lines
      ___ Optimal pressure for brightness

For all Spectral Observations:
[2]   ___ Where they probably came from (i.e. which gas)
      ___ Detail the rationale for assigning a line to a particular gas

__/5 Conclusion
   ___ A summary explaining the results
   ___ Results in a condensed and summarized form
   ___ Identify lines NOT from neon
      ___ Postulate how they got there
Discussion:
   ___ Impurities: How they might be removed?

__/2 References and footnotes
   ___ All references used cited
   ___ Quality references used for wavelengths, etc.
   ___ Footnotes as required (i.e. no "Magic Numbers")

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