Answer the Following Questions:

1. The photoelectric effect is important in explanation of light absorption by atomic and molecular species. Explain.

2. Aluminum has two emission lines at 309.27 nm and 309.28 nm; is it theoretically possible to just resolve these two spectral features using a 1200 line/mm grating that is 5cm*5cm? Assume operation in the first-order.

3. Draw a schematic of a grating monochromator, identify its components, and briefly explain how to judge its main performance characteristics.
4. Which is preferred a prism or a grating monochromator? Why?

5. Describe the silicone diode detector and comment on its advantages as compared to a photovoltaic cell detector.

6. Atomic absorption and atomic emission are affected by temperature. Show how temperature affects each. When does an increase in temperature have positive or negative effects on both?
7. Why is it not wise to make the instrument read zero for the absorbance of non-atomized matrix components?

8. Calcium forms compounds of low volatility when sample contains sulfates or phosphates. What effects on signal does this process have? What can be done to minimize it?

9. Draw a schematic of a single beam flame absorption spectrophotometer, identify all components and describe one method for soluble sample introduction.
10. In atomic emission techniques, an internal standard is usually used. What is an internal standard and why is it used?

11. Describe the two lines background correction method used in AAS.

12. What are the main advantages of plasma emission spectroscopy over atomic absorption spectroscopy? When do you go for axial, rather than radial, view plasma?