Astronomy & Astrophysics I Quiz 3 NAME:

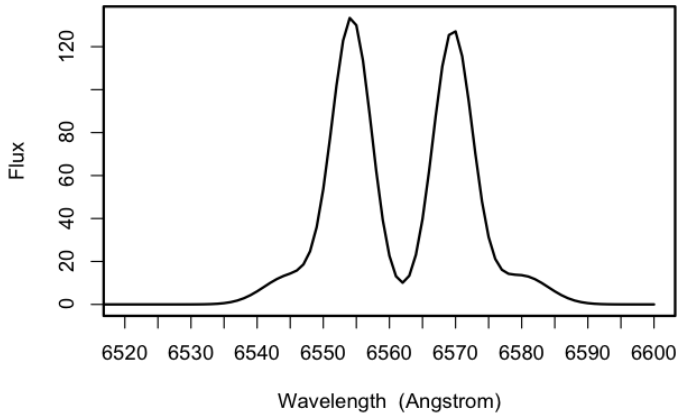
1. Sketch the Hertzprung Russell Diagram, with approximate luminosity and temperature scales. Luminosity can be in units of L_{Sun} or absolute magnitude. Temperature in Kelvin.

   Indicate the location of the following features: Main sequence, Red giants, White dwarfs. Add the spectral types if you can. [8 points]

2. Why do the spectra of A type stars show strong Hydrogen Balmer absorption lines, but M stars have none ? [5 points]

3. List the physical processes that give spectral lines their width and shape. [4 points]

4. A certain Be type star has a double peaked Hα emission line, as shown in the figure below. What is the average orbital velocity of the gas in its circumstellar disk? [3 Points]



Bonus Q: Estimate the physical size of the disk, assuming a $10M_{Sun}$ Be star.
($M_{Sun}=2x10^{30}$ kg, $R_{Sun}=7x10^{5}$ km)