1. List the 6 assumptions that must be satisfied in order for a population to be in Hardy-Weinberg equilibrium:

1. 
2. 
3. 
4. 
5. 
6. 

2. Consider the two populations below. Are they in Hardy-Weinberg equilibrium (do the 6 assumptions hold?) - explain why or why not? You can ignore the assumption about Mendel's first law (but know what Mendel's 4 laws are!)

What does it mean if they are or are not in H-W equilibrium?

Population A
In Blase Vegas, live an elite group of wealthy and powerful families - however there are really only two families to speak of, the Mentalgues and the Nightcapulets. Together the two families make up the only, albeit tiny, upper-class suburb called Verona. Because the Mentalgues and Nightcapulets are very strict on family honor and are xenophobic, only Mentalgues and Nightcapulets have ever lived, or will ever live, in Verona. Inhabitants of Verona have very specific taste when it comes to marriage partners - they find having eyebrows on a person to be a turn-off, so only people without any eyebrows are considered desirable to marry. Besides the fact that Veronian generations are possessing less and less eyebrow hair, there's just something about Mentalgue and Nightcapulet marriages that is making successive generations more prone to sickness (can you think of a term to describe this trend and the reason for it in this population?). An example of this prone to illness is blurry vision. But because they are so rich, every single one of them can afford to purchase thick glasses to let them see well. So despite some individuals' genetic setbacks, they would be able to live their daily lives without fear of being killed by things like cars (which they wouldn't be able to see had they no glasses).

Population B
In the red light district of Blase Vegas, there live a different kind of citizen - although it is hard to say if the majority of them have genuinely lived in Blase Vegas enough to have been granted citizenship, as the red light district tends to attract many illegal immigrants or 'visitors'. Procreation is rampant and so the burgeoning population is crowding the streets. Some speculate such a large population is probably due to the fact that men and women of the red light district of Blase Vegas are ridiculously promiscuous and one night stands with random strangers is the norm. Because sexually-transmitted diseases are rampant and there is poor hospital services in the district, individuals who are genetically not able enough to survive tend to die early and thus have very few children compared to those individuals who are more genetically fit against STDs. It's interesting to see certain individuals' phenotypes in this area of town - there are people with three eyes, abnormally high IQs or people who can eat and digest metal.