Biochemistry 411  
Quiz 10

1.) (2 Points) Nitrogen fixation occurs in some microorganisms. Briefly describe this process and how it is beneficial to plants.

**Answer:** Nitrogen fixation is the process by which nitrogen gas is converted into the usable nitrogen source NH$_3$. This process benefits plants because microorganisms that utilize this process are located at root nodules of plants and can therefore supply NH$_3$ to plants.

2.) (2 Points) Transamination reactions involving the use of glutamate as a substrate is used in the synthesis of what four essential amino acids?

**Answer:** Alanine, Aspartate, Glutamine, Asparagine

3.) Consider the compound glutamate-γ-semialdehyde.

a.) (4 Points) Write the reaction form the formation of glutamate-γ-semialdehyde from glutamate. Show all structures for substrates, intermediates and products.

b.) (2 Points) What two amino acids are made from glutamate-γ-semialdehyde?

**Answer:** Arginine and Proline