

**BIOSCI 1820**  
**Quiz #6**  
**APR 2002**

I. Name two of the three ways that ammonia ( $\text{NH}_3$ ) is produced in nature (i.e. what is the precursor and how is the conversion catalyzed)?

II. What are the two molecular "carriers" in the blood that are used to transport ammonia to the liver for detoxification?

III. Which of the following is NOT one of the proteolytic activities housed in the proteasome?

1. chymotryptic
2. acidic
3. calpain-like
4. tryptic
5. none of the above (the proteasome utilizes all of these activities)

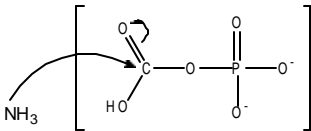
IV. Which of the following will NOT be inter-converted by a transaminase reaction?

1. pyruvate and alanine
2. oxaloacetate and aspartic acid
3.  $\alpha$ -ketoglutarate and glutamic acid
4. malate and serine
5. none of the above (they can all be interconverted by the enzyme)

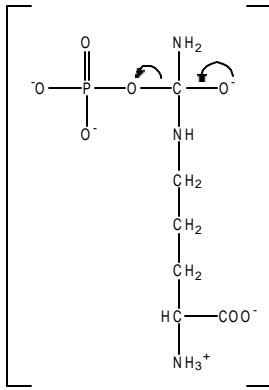
V. Besides using a transaminase, there is another way to create glutamic acid from a precursor lacking nitrogen. What is the name of the enzyme that catalyzes this reaction? Also, draw the structures of ALL of the reactants and products and be sure to indicate the cofactor required.

VI. What are the names of the enzymes that catalyze the reactions containing the following intermediates?

A. \_\_\_\_\_



B. \_\_\_\_\_



VII. A radioactive NH<sub>3</sub> molecule (labeled at the nitrogen) is added to a cell lysate capable of undergoing the urea cycle, where it condenses with CO<sub>2</sub>. Draw the structure of arginosuccinate and indicate at which position(s) the radiolabeled nitrogen would reside.

VIII. How many ATPs are required to conjugate ubiquitin onto an E2 (also known as a Ubiquitin Conjugating Enzyme)?

IX. Onto which amino acid is ubiquitin conjugated in substrate proteins that are targeted for degradation by the proteasome?