

BIOSC 1820
Metabolic Pathways and Regulation
Spring, 2012
Prof. Jeffrey L. Brodsky
Quiz #5
April 4, 2012

NAME: _____

1. Indicate for each of the following three questions the full name of the complex in the electron transport chain that is being referred to:

A. This complex catalyzes the step that represents the biggest “drop” in free energy (i.e., the ΔG for 2 electrons transported through this complex is the most negative).

B. The transfer of 2 electrons from this complex is inhibited by rotenone and amytal.

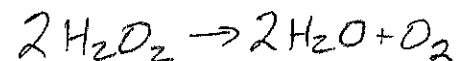
C. This complex contains cytochrome b_{560} , which insulates the electron transport chain.

2. The _____

is associated with P680 in Photosystem II and reacts with water.

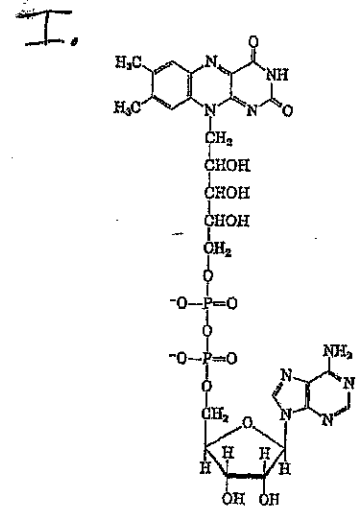
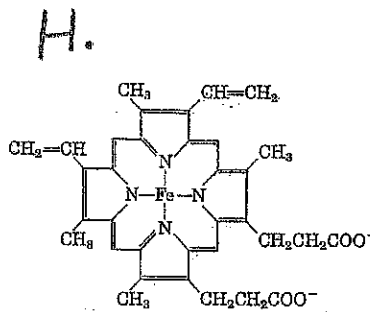
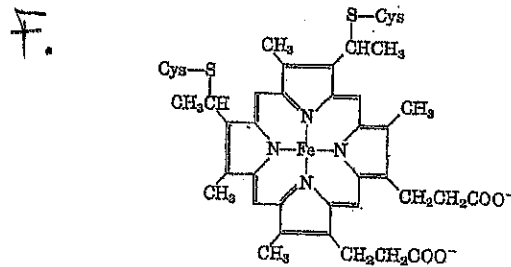
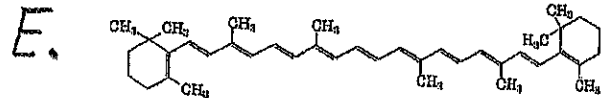
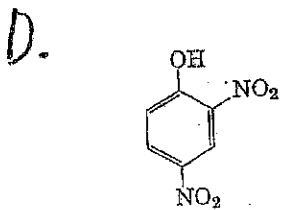
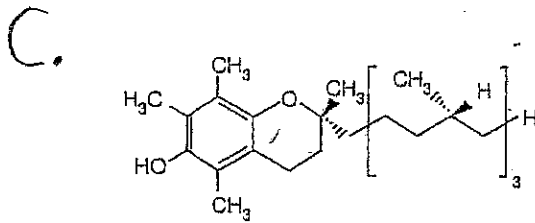
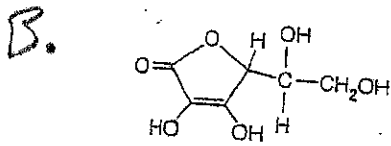
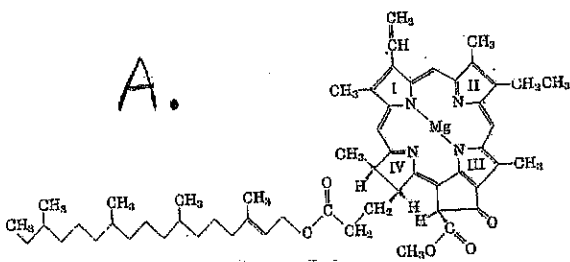
3. The Adenine Nucleotide Translocase (or antiporter) requires which component of the PMF to function?

4. The following reaction is catalyzed by which enzyme?



5. Which of the following structures:

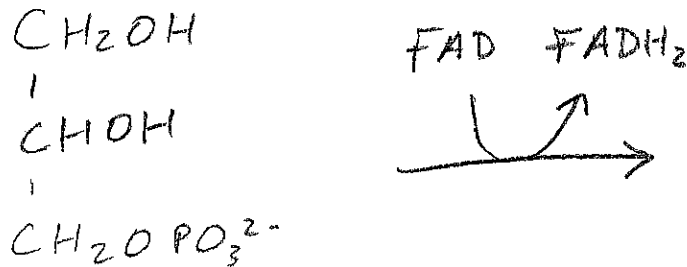
- i. Will lead to the consumption of oxygen without allowing ATP synthesis in a respiring mitochondria? _____
- ii. is β -carotene? _____
- iii. is a chlorophyll? _____
- iv. is found in cytochrome c? _____



6. In plants that are exposed to sunlight, protons are pumped into which compartment against their concentration gradient?

7. Assuming that there was no non-specific "leak" of protons across the mitochondrial inner membrane, what effect would oligomycin have on the continued breakdown of glucose in a cell in the presence of oxygen? Why?

8. Draw the structure AND give the name of the product of the following reaction:



Name one tissue in which this reaction is critical for the delivery of electrons into the mitochondria:

9. Based on the results in the paper that was discussed in the recitation, name TWO factors that contribute to the amount and/or speed of ATP synthesis in the experiment using isolated chloroplasts.