***Phylogeny and Earth Origins:***

***Possible Free-Response Questions***

**1.** **Construct** and **Interpret** Phylogenic Trees using biochemical and physical data.

**2.** Scientists recently have proposed a reorganization of the phylogenetic system of classification to include the **Domain**, a new taxonomic category higher (*more inclusive*) than the **Kingdom** category, as shown in the diagram below.

**Universal Ancestor**

 **Domain Bacteria Domain Archaea            Domain Eukarya**

  *(Eubacteria)            (Archaebacteria) (Eukaryotes)*



**Universal Ancestor**

 **(a)** **Compare** and **contrast** the old five-kingdom classification scheme with the newer three-domain / four-kingdom scheme and **describe** how this classification scheme presents different conclusions about the relationships among living organisms than those presented by the older system.

 **(b) Describe** three kinds of evidence that were used to develop the taxonomic scheme above, and

 **explain** how this evidence was used.

***(****The evidence may be structural, physiological, molecular, and/or genetic.)*

**3. (a) Explain** the endosymbiotic theory and **discuss** (in detail) three observations that support it.

 **(b) Relate** this theory to Darwin’s phrase, “descent with modification.”

**4. (a)** **List** and briefly **describe** the conditions on early Earth that made the origin on life possible.

 **(b)** **Describe** the contributions that A. I. Oparin, J. B. S. Haldane, and Stanley Miller made toward

 developing a model for the abiotic synthesis of organic molecules.