

## **BSC1011 - Biology 2**

### **Exam 1 Essay Study Questions**

- 1. Although members of the Domains Archaea and Bacteria are simple cells, they have been successful in surviving through millennia. However, bacterial pathogens include a large number of viruses called bacteriophages.**

  - List and **briefly** describe the different groups of Archaea.
  - List and **briefly** describe the different shapes that are used to differentiate various prokaryotes.
  - List and **briefly** describe the basic patterns of respiration and reproduction among the prokaryotes.
  - List the basic characteristics of **all** viruses, and then indicate which of these characteristics apply to bacteriophages. Why are viruses currently considered to be non-living?
  - List and **fully** describe the two ways in which bacteriophages can invade and destroy bacterial cells.
  
- 2. Taxonomy of the more primitive kingdoms of prokaryotes and eukaryotes are changing dramatically because of advances in molecular biology. However, certain ideas about the evolution among eukaryotes have been supported by molecular research.**

  - Discuss the LUCA concept vs. the current phylogenetic arrangement of the three living domains and the reason that the LUCA concept is no longer considered accurate at the domain level.
  - Discuss the concept of endosymbiosis at both the primary and secondary leveling relationship to the evolution of the eukaryotic cell type.
  - Select TWO of the following "clades" and indicate the character(s) that define them, then list the phyla within the clade, a defining characteristic for each, and one example for each (common names are acceptable): Euglenozoa; Alveolata; Stramenopila, and; the clade containing amebas.
  
- 3. Members of the kingdom Fungi are well represented in many habitats around the world. The different phyla of this kingdom, though similar in basic construction, show some distinctive differences in sexual reproduction structures.**

  - First, list the four phyla and discuss the differences in sexual reproductive structures among them.
  - Second, what are lichens and mycorrhizae and why are they important to the ecosystems in which they occur?
  - Third, in reference to their methods of acquiring nutrition both fungi and many members of the kingdom Eubacteria are often referred to as "decomposers". What is decomposition, and why do **you** think this description has been applied?
  
- 4. In the Kingdom Plantae, you've been exposed to what seems like an enormous number of life cycles. Actually, all of these patterns can be related back to two variations on a theme. The theme is alternation of generations, the variations are homospory and heterospory.**

  - First, discuss the pattern of alternation of generations in plant reproduction, using appropriate scientific terms. What differences are found among the four major groups of plants with respect to this general pattern?
  - Second, define the terms homospory and heterospory AND provide general diagrams for each to show the similarities and differences.
  - Finally, what do you think is the evolutionary significance of homospory and heterospory in terms of plant habitat, reproductive success and plant dispersal?
  
- 5. The seed producing, flowering, vascular plants known angiosperms are the most successful of all plant groups living today. Vascular tissues were one major adaptation for success, but the production of flowers and fruit by all members of this group led to the greatest success.**

  - Name and **fully** describe both of the vascular tissue types. Discuss the transpiration model and pressure flow hypothesis.
  - List and **briefly** describe five differences between a monocot and a dicot, and give one example for each class.
  - Describe a flower and all its parts.
  - Define what is meant by a seed, and describe the process of fruit formation.
  - List the four major categories of fruit, describe the differences among them and give an example for each.

- Based on your discussion of vascular tissues, flowers and fruit, why do **you** think flowering plants are the most successful (diverse) group?