

Biology 2 Examination #2
ESSAY QUESTION STUDY SHEET

NOTE: If the question asks for a brief description or mention of something, that part of the answer can be a few words to one or two sentences at most. If you are asked to discuss or fully describe something, then provide as complete an account as possible!

1). 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 homospority and heterospority. The seed producing, flowering, vascular plants, or angiosperms are the most successful of all plant groups living today. In large part this is due to the production of flowers and fruit by all members of this group.

- Explain 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?
- Define the terms homospority and heterospority and provide general diagrams for each to show the similarities and differences.
- What do you think is the evolutionary significance of homospority and heterospority in terms of plant habitat, reproductive success and plant dispersal?
- Briefly describe a flower and all its parts.
- Define what is meant by a seed, and describe the process of fruit formation.
- Why do you think flowering plants are the most successful (diverse) group?

2). When a non-biologist thinks of a skeleton, invariably they think of the hardened human skeleton. However, not all skeletons are hard structures, nor are all internal.

- Give a general definition for the term skeleton and list the main functions of any skeletal system.
- List and **fully** describe the main categories of skeletons, their strengths and weaknesses, and give an example of an organism with each skeletal type.
- In many organisms, the skeleton is also the **integument**. List the functions of the integumentary system and from Porifera through Chordata, describe the phylogenetic changes in the integumentary system.

3). The animal kingdom is highly diverse, with over 1,500,000 described species. This tremendous diversity is structured around just four basic animal tissue types.

- Define the term germ layer and list each of the germ layers, giving their location in a developing embryo and examples of a tissue each will produce.
- List and describe each of the four main animal tissue types, along with their basic functions and the germ layers from which they arise.
- List ALL the different types of tissues within the four main categories, their basic components, and briefly describe the functions of each.

4). Heat production is natural in animals due to muscle activity. Heat loss or gain and regulation of heat, however, varies among different animal groups.

- First, list and explain the four ways in which heat can be lost from, or gained to, an animals body. List an example for each category.
- Second, define the terms **conformer**, **regulator**, **ectotherm**, **endotherm** and **homeotherm** and list an example for each.
- Finally, list and **fully** describe the main ways in which animals can regulate temperature gain or loss.

5). Terrestrial and aquatic vertebrates face very different challenges in developing systems for gas exchange with their environment.

First, list ALL the differences between the aquatic and terrestrial environments in relation to availability of oxygen and the problems that each group might face in developing such an oxygen transfer system.

Next, describe how each group has evolutionarily responded to the challenges of each environment. **BE SURE** to include any auxiliary systems that might be used and the classes that use them.

Discuss the modifications to the gas exchange systems found among terrestrial vertebrates, which classes have adopted which modifications and why such modifications were necessary.

Finally, list the number of, and name the heart chambers for each of the vertebrate classes. What is the evolutionary significance of the increasing number of chambers?