**Winter Break Assignment: DUE 1/4**

CH 40

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| Functional Animal Anatomy: An Overview | | |
| 1. | Define *bioenergetics.* |  |
| 2. | Distinguish between anatomy and physiology. Explain how functional anatomy relates to these terms. |  |
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|  | Body Plans and the External Environment | | |
| 3. | Explain how physical laws constrain animal form. |  |  |
| 4. | Explain how the size and shape of an animal’s body affect its interactions with the environment. |  |  |
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| 5. | Distinguish among collagenous fibers, elastic fibers, and reticular fibers. |  |  |
| 6. | From micrographs or diagrams, correctly identify the following animal tissues, explain how their structure relates to their functions, and note examples of each type. a. Epithelial tissue b. Connective tissue     i.  Loose connective tissue     ii. Adipose tissue     iii. Fibrous connective tissue     iv. Cartilage     v.  Bone     vi. Blood c. Muscle tissue     i.  Skeletal (striated) muscle     ii. Cardiac muscle     iii. Smooth muscle d. Nervous tissue     i.  Neuron |  |  |
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|  | Introduction to the Bioenergetics of Animals | | |
| 7. | Describe the basic sources of chemical energy and their fate in animal cells. |  |  |
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| 8. | Define *metabolic rate* and explain how it can be determined for animals. |  |  |
| 9. | Distinguish between endothermic and exothermic animals. |  |  |
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| 10. | Distinguish between basal metabolic rate and standard metabolic rate. Describe the major factors that influence energy requirements. |  |  |
| 11. | Describe the natural variations found in the energy strategies of endotherms and ectotherms. |  |  |
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|  | Regulating the Internal Environment | | |
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| 12. | Define *homeostasis.* Describe the three functional components of a homeostatic control system. |  |  |
| 13. | Distinguish between positive and negative feedback mechanisms. |  |  |
| 14. | Define *thermoregulation.* Explain in general terms how endotherms and ectotherms manage their heat budgets. |  |  |
| 15. | Name four physical processes by which animals exchange heat with their environment. |  |  |
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| 16. | Explain the role of vasoconstriction and vasodilation in modifying the transfer of body heat with the environment. |  |  |
| 17. | Describe animal adaptations to facilitate evaporative cooling. |  |  |
| 18. | Describe thermoregulatory mechanisms utilized by endothermic invertebrates. |  |  |
| 19. | Explain how ectotherms and endotherms may acclimatize to changing environmental temperatures. |  |  |
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| 26. | Define *torpor, hibernation, estivation,* and *daily torpor.* |  |  |

Ch 41

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| Nutritional Requirements of Animals | | |
| 1. | Compare the bioenergetics of animals when energy balance is positive and when it is negative. |  |
| 2. | Name the three nutrition needs that must be met by a nutritionally adequate diet. |  |
| 3. | Distinguish among undernourishment, overnourishment, and malnourishment. |  |
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| 4. | Explain the role of leptin in the regulation of fat storage and use. |  |
| 5. | Define *essential nutrients* and describe the four classes of essential nutrients. |  |
| 6. | Distinguish between water-soluble and fat-soluble vitamins. |  |
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|  | Overview of Food Processing | | |
| 7. | Define and compare the four main stages of food processing. |  |  |
| 8. | Compare intracellular and extracellular digestion. |  |  |
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|  | The Mammalian Digestive System | | |
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| 9. | Name three functions of saliva. |  |  |
| 10. | Compare where and how the major types of macromolecules are digested and absorbed within the mammalian digestive system. |  |  |
| 11. | Explain why pepsin does not digest the stomach lining.Explain how the small intestine is specialized for digestion and absorption. |  |  |
| 12. | Explain how the small intestine is specialized for digestion and absorption. |  |  |
| 13. | Describe the major functions of the large intestine. |  |  |
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|  | Evolutionary Adaptations of Vertebrate Digestive Systems | | |
| 14. | Relate variations in dentition and length of the digestive system to the feeding strategies and diets of herbivores, carnivores, and omnivores. |  |  |
| 15. | Describe the roles of symbiotic microorganisms in vertebrate digestion. |  |  |