

Name \_\_\_\_\_  
ID \_\_\_\_\_

This is an open book examination that is due on Friday August 1 at 4:00. You may email your answers to me (rmoen@nrri.umn.edu) instead of handing in a paper copy. If that is the case, the time on the email must be on or before 4:00 on Friday August 1. If you hand in a paper copy when I am not in the lab, you should give it to personnel in the Biology Dept. office. They will place it in my mailbox.

You are required to write the examination on a word processor—I will not accept hand-written answers.

Grammar and sentence composition are part of the grading criteria. Your answers should be organized and readable. I recommend that you outline an answer first, then do a rough draft, and finally put finishing touches on the answer.

You are not allowed to either give or receive assistance on this examination, from individuals in the course or individuals outside of the course. By turning in the examination you are implicitly stating that you have neither given nor received assistance in completing the examination.

The questions have been posted on the course website as a Word file that you can download. The examination is worth 100 points. If you have any questions, feel free to contact me. Good luck.

1. (10 points). The order Carnivora includes several families, among them the Felidae, the Hyaenidae, the Canidae, and the Ursidae. Compare and contrast family characteristics, morphology, and general behavior patterns of 2 of these 4 families that are listed. Highlight (i.e., bold or underline) and define important words in your answer.
2. (10 points). The Cetacean skeleton and skull has undergone remarkable changes over evolutionary time. Identify and define these changes, and also describe how the change is beneficial to the organism(s). Highlight (i.e., bold or underline) and define important words in your answer.
3. (10 points). Sirenians and Proboscideans includes species that have greatly declined in number over the past few centuries. Describe the similarities and differences between these 2 orders that have led (in part) to the current threatened, endangered, or extinct status of many representatives of these orders.
4. (10 points). Describe and explain the changes that have occurred that have led to the success of “ungulates” relative to many other species. Specifically, describe either changes associated with locomotion or changes associated with food processing and the digestive tract. Include definitions of important words in your answer.
5. (5 points). Briefly describe, compare, and contrast the characteristics (similarities and differences) of the 3 extant families in Perissodactyla. Highlight (i.e., bold or underline) and define important words in your answer.

6. (5 points). Pick one of the following 2 questions (6a or 6b) to answer:

6a. Compare and contrast the general characteristics (e.g., distribution, abundance, morphology, behavior) of Sciuridae, a generalized rodent family, with those of a specialized rodent family, Castoridae.

6b. Describe the anatomical differences (skeletal, muscular) between the sciurognathous and hystricognathous types, and contrast these types to the primitive condition. Give an example species for each type, including an example species for the primitive condition.

7. (10 points). Two orders that have a single family are Macroscelidea and Scandentia. What are common characteristics of these orders and what are differences? Highlight (i.e., bold or underline) and define important words in your answer.

8. (10 points). Pick one of the following 2 questions (8a or 8b) to answer:

8a. Discuss the taxonomy, morphology and distribution of Steller's sea cow (*Hydrodamalis gigas*), including your understanding of why this species is now extinct. Include definitions of important words in your answer.

8b. Compare feeding adaptations (e.g., form, function, prey size) of the two cetacean suborders Odontoceti and Mysticeti. Include definitions of important words in your answer.

9. (10 points). Describe similarities and differences in reproduction in *Ornithorhynchus anatinus*, *Didelphis virginiana*, and *Diceros bicornis*. Highlight (i.e., bold or underline) and define important words in your answer.

10. (15 points) Complete the information in the table for these mammalian groups

Order	Family	Common Name	Zoogeographic Region(s)	Adaptation(s) of Family
	Hominidae			
Scandentia				
	Leporidae			
	Tapiridae			
	Bovidae			
Hyracoidea				
	Muridae			
	Orycteropodidae			
Macroscelidea				
	Ursidae			

11. (5 points). What do you think (drawing on what you have learned from the textbook and class) are the most important characteristics that have made it possible for mammals to develop a nearly worldwide distribution with representative species in most of the available habitats? Highlight (i.e., bold or underline) and define important words in your answer.