

Instructions: This review is worth 150 points (15% of course grade) and will be due on Monday, 3/13/05 in class. Late reviews will not be accepted. **You may not consult** any references or any other person while working on this review. Your signature at the bottom of the last page signifies that the work is yours alone, was completed in four hours or less, and is pledged under the Honor Code. When you begin you will have **four hours to complete the review**.

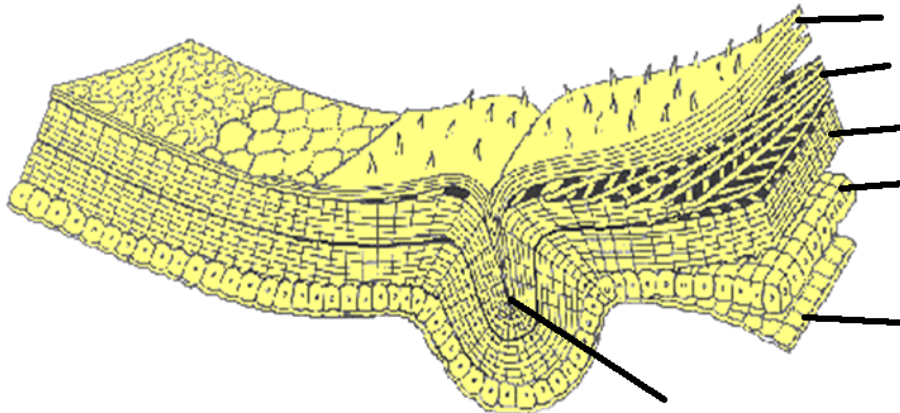
Confine your answers to the space below each question. Print legibly! Alternatively, you may type your answers to each question, and attach the printout to the review (or e-mail it to me). For each question or part to a question, limit your answers to one concise paragraph, unless otherwise specified. Lengthy answers will be penalized the same as handwritten answers that spill out over the space provided. Each question is worth **10 points**.

This list of all 33 orders of insects will prevent spelling mistakes. Knowing common names of these orders is up to you.

Protura	Grylloblattodea	Neuroptera
Collembola	Mantophasmatodea	Megaloptera
Diplura	Phasmatodea	Raphidioptera
Zygentoma (Thysanura)	Embiidina	Coleoptera
Archeognatha	Orthoptera	Strepsiptera
Ephemeroptera	Dermaptera	Diptera
Odonata	Zoraptera	Mecoptera
Plecoptera	Psocoptera	Siphonaptera
Isoptera	Phthiraptera	Lepidoptera
Blattodea	Hemiptera	Trichoptera
Mantodea	Thysanoptera	Hymenoptera

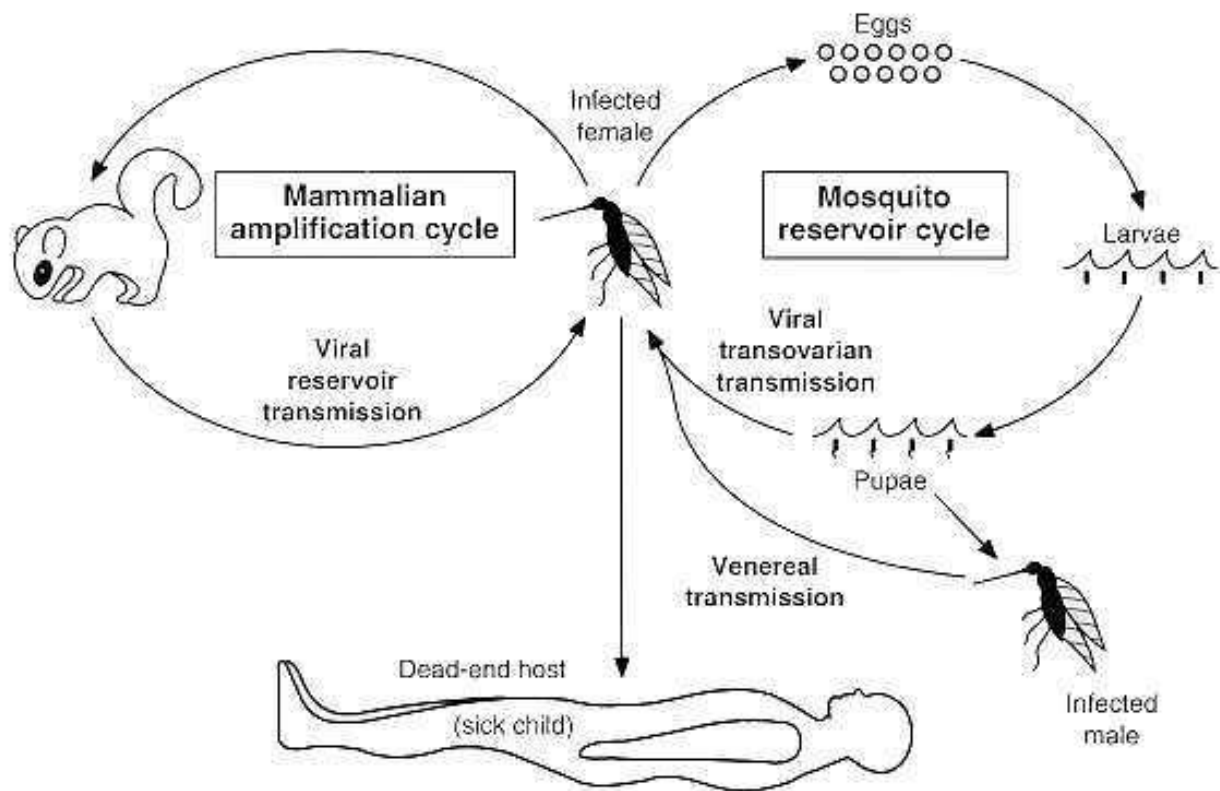
1. Describe in detail the external morphology of a generalized insect head. You may construct a labeled drawing to assist you.
2. Why is it important to classify insects (or other organisms, for that matter) using monophyletic relationships? Provide one clear and concise reason.
3. What are two evolutionary lineages (above the Order level) within Superclass Hexapoda, and what are distinguishing characteristics of each?

4. Label the structures indicated by the black lines on the diagram below of a generalized insect cuticle, and answer the two short answer questions.
 - a. In what layer does sclerotization occur?
 - b. What is one component in the outermost layer that is important in preventing desiccation?



5. Provide two examples of insect leg adaptations, along with an example of a type of insect (specify the taxonomic level of each example) with each adaptation and what advantage it provides to the insects that possess it.
6. What is one hypothesis that attempts to explain the evolution of wings in insects? Provide evidence to support your hypothesis.
7. Describe how indirect flight muscles work and at least one order who possesses them.
8. Describe and draw the basic structure of the meso- or metathoracic segment of a neopteran.
9. Although hexapods are coelomate animals, they have a much reduced coelom. Along with the evolution of a reduced coelom probably came the open circulatory system. What other systems or structures evolved along with these structures to allow hexapods to remain active and mobile, despite a relatively inefficient circulatory system? Explain how these structures are important to the mobility and active habits of these animals.
10. Define holometabolism, and discuss the currently accepted hypothesis for the evolution of holometabolism.

11. Label the primary cycle, secondary cycle, and different types of hosts and transmission in the diagram below:



12. Answer **one of the following two** questions.

a. Describe how Lyme disease is transmitted, and why it appears to be so common in the northeaster United States?

OR

b. Describe how bubonic plague is transmitted, and how a plague epidemic begins.