ZOO 4926§6690/6927§6767 midterm exam, 25 Feb 2009

Please write your name on every page.

1   Definitions (10 points)

Define five out of six in a phrase or sentence.
  a. phoresis b. symbiont c. monoxenic
  d. trophic cascade e. herd immunity f. incidence

  1.

  2.

  3.

  4.

  5.

2   Short answers (20 points)

Answer 4 out of 5. Feel free to draw diagrams where appropriate.

   a. Describe three ways that infectious disease can drive a host population extinct (and, briefly, how each works).

   b. Using the criteria "lives in closes association with the host" and "routinely kills its host", divide natural enemies into parasites, predators, grazers, and parasitoids.

c. Give three reasons that epidemic outbreaks of a particular infectious disease would continue to occur in a population, despite the simple theoretical expectation that the outbreaks would damp out to an equilibrium over time.

d. What is the difference between exploitation, interference, and apparent competition, and how might they apply to the regulation of *within-host* parasite densities?

e. Describe an example of a trait-mediated interaction that involves parasites.

1.

2.

3.

4.

3   Essays (70 points)

Answer *all three*: allocate about 15 minutes to each. Take a few minutes before you start writing to think about the organization of your answer and what points you're going to cover. Use examples and/or diagrams to illustrate your answers where appropriate.

   a. What is the difference between frequency- and density-dependent transmission? Why is it important? What kinds of diseases are each/either? What are the implications for disease persistence and control?

b. Blue and red tortoises have both been present on Paynes Prairie for a long time, but red tortoises appear to be strongly superior competitors. You suspect that apparent competition via a mosquito-borne virus is responsible for the coexistence of the tortoises. Explain what this all means and describe how you would attempt to prove your hypothesis by means of (1) a model and (2) an experiment.

c. Define "superspreaders" and explain their importance and effects on epidemics. Explain how the concept of superspreaders in epidemics is related to the concept of heterogeneity in cells in their response to intracellular bacterial infection.