

**BIO 45 -- Exam 2 – Optimization, Communication and Sexual selection
8 November 2000**

NAME _____ Practice exam for Bio 45 2002 _____

Question 1 _____ out of 12

Question 2 _____ out of 8

Question 3 _____ out of 8

Question 4 _____ out of 10

Question 5 _____ out of 8

Question 6 _____ out of 4

Total Points: _____ out of 50

INSTRUCTIONS:

1. Put your name on this page only - **Transfer the exam number to each page** of the exam.
2. **Read each question very carefully.** Give us **concise, short answers.** **Do not write on the back of the page** unless you have had to change your answer. We will take off points for errors even if the correct answer is given.
3. When **examples** are asked for, **use well documented ones**. Do not use hypothetical or anecdotal information (unless it is asked for). Citing species names and names of those who did the experiments will reduce ambiguity in your answers.
4. Do not use the same example more than once on the exam.
5. **If you feel a question is ambiguous - ask for clarification!** Do not hesitate to ask - some ambiguities are not intended and will be corrected during the exam.
6. Terms:

Explain = Show that you **understand** what is going on - don't just list facts.

Cite or Identify = Who did the work, on what species and some details relevant to the question. If you can't remember names, give enough detail for us to identify the study you mean.

Briefly = a few well-chosen words or phrases will suffice.

1. (12 pts) Let's explore your understanding of some basic concepts:

A. Hawks always beat doves in individual contests. However, when $C > V$, **Doves can invade but not replace a population of Hawks**. No pay-off matrix or numbers are needed. Just explain in words that **show you understand the dynamics involved** that allow invasion but not replacement.

Doves **can invade** because

Doves **cannot replace** a population of hawks because

B. Nuptial gifts of male hangflies (or the spermatophores of male katydids) could be mating effort or parental investment. **What has to be true if these nuptial gifts are:**

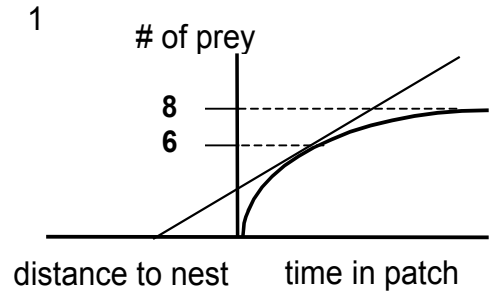
Mating Effort:

Parental Investment:

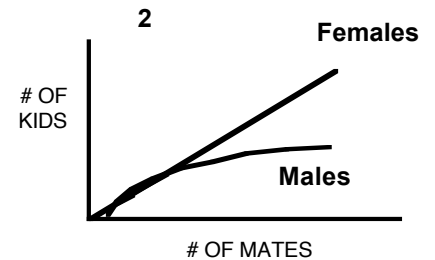
Writing below this line is NOT optimal:

2. (8 pts) Interpreting Graphs:

- A. Starlings can easily carry 8 prey items to the nest. **Explain why**, given Graph #1, it is optimal for them to take 6 and not 8 on each trip. Make sure your explanation reflects your understanding of the model underlying the graph.



- C. Someone shows you graph #2 and asks, “Is this possible?” You say, “Not just possible, it really happens.” **Explain – an example will help.**



3. (8 pts) What is **the take-home message** (main point) **of two** of the following papers?
- A. Amundsen’s paper on ornamentation in females.
 - B. Olson & Owens’ paper on carotenoids
 - C. Lima & Bednekoff’s study of anti-predatory vigilance

The take-home message of paper ____ was:

The take-home message of paper ____ was:

4. (10 pts)) **Models** of female choice that involve **indirect** benefits to females have some problems that those involving direct benefits to females do not always have.

A. (6 pts) Identify **two** of the **problems** that **indirect benefits models** have:

1.

2.

B.(4 pts) Briefly describe a solution for one of these problems. Which problem _____.

5. (8 pts) Identify two different ways that a prey animal, **once detected**, can make capture by a predator more difficult. **Give an example of each anti-capture adaptation.**

1.

2.

6. (4 pts) A matter of sex:

A. What is **THE** difference between males and females?

B. What is wrong with this statement? "Sperm are cheap, relative to eggs, so the males in any species will always out reproduce the females. "

If you filled all this space, your answer is probably wrong!