

BIO 45 – Exam #3 -- 11 December 2000

NAME _____

Third Hour exam

Question 1 _____ of 8
 Question 2 _____ of 8
 Question 3 _____ of 8
 Question 4 _____ of 9
 Question 5 _____ of 5
 Question 6 _____ of 12
 Total Points: _____ of **50**

INSTRUCTIONS:

1. Put your name on this page only - **Transfer the exam number to the other pages.**
2. **Take the first 20-30 min. to read through the exam and organize your thoughts.** Use the exam book we gave you for notes and draft answers. **Make sure that all your answers are on the exam** and that they are clear, concise, legible, and reveal your understanding of behavioral ecology.
3. **Do not write too much.** We will take off points for errors even if the correct answer is given. **Do not write on the back of the page** unless you had to change your answer.
4. **Read each question very carefully.** You need to figure out **exactly** what each one asks. **If you feel a question is ambiguous - ask for clarification!**
5. When examples are asked for, give preference to 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.
6. **Do not** use the same examples more than once on the exam
7. When asked for lists or alternatives **make sure that each is clearly distinct.**
8. Definitions:
 - “**Explain**” means show us that you understand what is going on - don't just list facts.
 - “**Explain**” **also means** that you tell why as well as give a reason.
 - List** = just identify, do not embellish unless it is needed to clearly identify things or differences.
 - Identify** = Who did the work, on what species and some details relevant to the question. If you can't remember names, give enough detail to identify the study.
 - Briefly** = a few well-chosen words or phrases will suffice.
9. If you read the instructions above, write your exam number here _____

1. (8 pts) correcting mistakes.

A. **Rewrite the following so that it is correct:** "The inclusive fitness of a male in a coalition of lions is the number of kids he fathers, plus the number of kids produced by other coalition males times his average relationship to the other males."

The inclusive fitness of a male in a coalition of lions is the number of kids he fathers, plus

B. "Because one male can fertilize all of a female's gametes, females do not benefit from mating with multiple males." **Explain why this is wrong.**

2. (8 pts) "Alternative possibilities..." -- For each of the following observations or situations, provide **two different but probable explanations**. Try to make these **mutually exclusive** alternative explanations and make sure they are based on material from the course.

A. Freda has found a population of jackals where young, unmated, but sexually mature males help raise pups by bringing food to the pups and the pups mother.

1.

2.

B. A molecular geneticist has studied a new bird species - the tannenbaum distlefink. She found -- in a sample of 10 chicks per nest for over a hundred nests -- that the relatedness of the chicks in each nest ranged from 0.00 to 0.50 with a mean of 0.25. She now asks you to tell her what kind of mating system the tannenbaum distlefink might have. Suggest two possibilities based on your understanding of mating systems (examples would help).

1.

2.

3. (8 pts) Explaining how:

A. How can you distinguish between helping and altruism using Hamilton's rule?

B. Ignatz studied a monogamous species in which individuals reproduce only once in their lifetime. It has a brood of 5 offspring and both parents care for the kids (bringing them food to eat). Ignatz says, "Clearly there is no parent-offspring conflict in this species because there are no future offspring to be produced by the parents." **Explain why he is right or wrong:**

Ignatz is _____ because

4. (9 pts) Good things come in threes --

A) What are three distinct things that can alter the operational sex ratio?

1.

2.

3.

B) Describe three different social **dynamics** for the single male - multi-female ("harem") **social** structure. Just enough information to clearly distinguish them. Examples will help.

1.

2.

3.

C) List **Alcock's** three hypotheses for monogamy?

1.

2.

3.

5. (5 pts) Carberry studied a eusocial wasp where workers have the choice of helping to raise brothers or helping to raise nephews (sons of reproductive sisters). Queens in this species only mate once. The workers help will add as many brothers as they will nephews. Workers are unable to reproduce at all (even sons). Under these conditions, **explain** what the workers should do.

6. (12 pts) What happened as a result of the following perspective shift in behavioral ecology? **“What happened”** means what was gained, what was revealed, what was cleared up and/or what is different as a result of the shift.

Write a **concise statement** that shows me you **understand the significance, for behavioral ecology, of the following perspective shift.**

“Concise” means use just **two ideas and examples** for the perspective shift. Do not add extraneous information – just two clear, supported points.

Short term costs and benefits TO long term costs and benefits

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