

## STUDY QUESTIONS FOR EXAM 2

Note: More questions will be added as we progress through the lecture material.

1. What are circadian rhythms? What is their function?
2. What cues (external or internal) are needed for circadian rhythms to operate? Describe the cues needed for these rhythms.
3. What is the role of the pacemaker cells in circadian rhythms?
4. Describe how circadian rhythms are regulated. What proteins and hormones are involved?
5. What does “entrainment” of the circadian clock refer to in organisms? What gene(s) and hormone(s) are involved in entrainment?
6. How do animals avoid doing 2 or more distinct activities at the same time? Given a choice between two behaviors, what factors might an organism “consider” in the choice.
7. In which process is the Pineal gland important?
8. How does altering levels of melatonin influence human behaviors?
9. What does the following statement suggest about circadian rhythm control in humans? “A New York Times article suggests that travelers might reduce the effects of jet lag by shining a bright light behind their knees.”
10. What are circannual rhythms? Give an example in which proper circannual rhythms are critically important to the fitness of an animal.
11. How might circadian and circannual rhythms be related? Give an example for birds.
12. What cues other than light might be important for the regulation of circannual rhythms?
13. Give an example of an organism that requires social stimulation of breeding.
14. How do female anoles become non-receptive after copulation? Why might this be adaptive?
15. Give an example of how testosterone might mediate a behavior.
16. What are the four stages of the predation process?

17. Describe four reasonable hypotheses for the occurrence of stotting behavior in Thomson's gazelles. Which hypothesis offers the best explanation for the occurrence of stotting? Why?
18. Imagine a Red-Tailed Hawk hunting a field mouse. Describe one possible scenario that might take place between these two organisms. (Note: There should be 4 components to your description.)
19. What are the differences between the assumptions and the predictions of a hypothesis? Demonstrate your understanding of this concept by developing a hypothesis regarding predation by wolves on moose. Describe your assumptions and your predictions.
20. Describe 4 modes that predators might employ to detect prey. For each detection mode, give an example of a predator that might use such a strategy and explain why they might prefer that mode of detection.
21. Describe one method that prey might utilize to avoid detection by predators.
22. What are the costs of being cryptic?
23. What is aposematism? Give an example of an organism that has an aposematic characteristic and describe the characteristic.
24. Given that a prey has been detected, describe three mechanisms by which a prey might deter attack. Give an example for each of your mechanisms.
25. What is the difference between Batesian and Mullerian mimicry?
26. Give an example of how a prey organism might "startle" its predator to reduce capture success.
27. What is vigilance? Why are organisms vigilant?
28. Describe both the selfish-herd and dilution hypotheses for group-living. How do these two hypotheses differ?
29. Describe 5 ways in which prey might reduce risk of consumption even after being captured.
30. Predators generally employ one of two general strategies to catch prey. What are the two strategies and what are the behavioral requirements of the prey for each strategy to be effective?
31. Why might animals scream when they are captured? Offer two hypotheses and defend which of the two is more accepted.
32. How might the comparative method be used to help determine whether a particular hunting strategy and cue preference are correlated and/or adaptive?

33. A cladogram of lizard feeding and cue preferences is presented in the notes and the book. What does the cladogram suggest about the relationship between hunting strategies and cue preferences. Can you determine from this cladogram if there might be an adaptive advantage to a particular combination or correlation of hunting strategies and cue preferences?
34. What are passive-food finders? Give an example of a passive-food predator and describe its mechanism to catch prey.
35. Why might some passive predators bait their traps with sex pheromones of their prey?
36. How might predators exploit the senses of their prey? Offer two examples.
37. Why is communication a critically important component of social foraging theory?
38. What are the foraging benefits and costs of being in a group?
39. How do honeybees communicate the direction and distance to a food source?
40. Offer an example of a predator that hunts cooperatively. Why is it advantageous for this predator to hunt cooperatively. What might be the costs of cooperative hunting?
41. Suggest some hypotheses about why observed group sizes are nearly always larger than the sizes that maximize per-individual food consumption?
42. In a study of hyena foraging success, it was demonstrated that hyenas foraging in a group of 20 individuals had the highest individual feeding success. However, in most situations, hyenas hunt in groups of much less than 20. Why might this occur?
43. Why is it difficult to be a vegetarian? Offer two possible reasons.
44. Why do many organisms eat dirt?
45. Many spices are actually poisonous to humans if consumed in large quantities. Offer two adaptive hypotheses for why humans might eat spices.