

EXAM ONE – Organisms, Evolution, and Ecosystems (BIO 112)

READ INSTRUCTIONS CAREFULLY BEFORE YOU BEGIN THE EXAM

You will likely need a calculator for this exam. While I will not grade specifically on grammar, spelling, etc., I will take off points for answers that are not clearly understandable (e.g., incomplete sentences, circular reasoning, etc). You should read the questions very carefully and write **clearly, completely, and concisely**. In other words, make your answers easily understandable, make sure you cover everything, but don't put a lot of "fluff" in there. I will take off for excessive and unnecessary writing. When drawing diagrams or graphs, make sure they are neat, and that you clearly label everything that needs to be labeled (for example, axes on graphs).

You may use blank spaces or the back of pages for calculations, etc.

Total points possible is 100. Points for each question are indicated in parentheses.

Do NOT put your name here. See last page.

Matching: Put the letter of the best match in the blank. There can be only one letter per blank (1.5 points each; 30 points total).

_____ <i>r</i>	A. a experimentally demonstrated keystone predator
_____ <i>K</i>	B. B minus D
_____ <i>N</i>	C. causes gall bladder to contract
_____ Clements	D. a K-selected species
_____ Gleason	E. signals pancreas to release bicarbonate
_____ McArthur	F. produced by salivary glands and pancreas
_____ Wilson	G. produce only a few offspring at a time
_____ Brown Tree Snake	H. digests fats
_____ Suspension feeder	I. predicted well-defined communities with boundaries
_____ Hoatzin	J. has hind gut fermentation
_____ Systole	K. community structure is determined by environmental gradients
_____ Diastole	L. population size
_____ Iteroparity	M. worked with Wilson
_____ polar bear	N. zymogen
_____ <i>Pisaster</i> (starfish)	O. introduced into Guam
_____ secretin	P. heart during contraction
_____ cholecystokinin	Q. made predictions about island biogeography
_____ lipase	R. carrying capacity
_____ amylase	S. heart during relaxation
_____ trypsinogen	T. Blue whale

Multiple Choice: There is only one best answer for each question. Circle the correct answer.
(2 points each; 20 points total)

1. Which of the following factors can limit the density of populations?

- A. competition
- B. predation
- C. territoriality
- D. environment
- E. all of the above

2. A flower that has a long pistil (tube where nectar is held) that only fits a certain species of moth is a good example of _____.

- A. the competitive exclusion principle
- B. coevolution
- C. mullerian mimicry
- D. succession
- E. none of these

3. The amount of light energy converted to chemical energy by plants is called the _____.

- A. net productivity
- B. biomass
- C. primary productivity
- D. secondary productivity
- E. none of these

4. Which of the following are considered chemosynthetic symbionts?

- A. deep sea ocean vent tubeworms
- B. earthworms
- C. cows
- D. coral
- E. all are chemosynthetic symbionts

5. Which phylum has a gastrovascular cavity?

- A. Annelida
- B. Arthropoda
- C. Colenterata
- D. Mollusca
- E. Chordata

6. Parietal cells are found in the _____ and they secrete _____.

- A. stomach, amylase
- B. small intestine, HCl
- C. small intestine, amylase
- D. stomach, HCl
- E. none of these is correct

7. Which group of animals all have open circulatory systems.

- A. a leech, a fish, and a clam
- B. a fish and a clam
- C. a clam, a grasshopper, and an earthworm
- D. a frog, a beetle, and an earthworm
- E. a clam, a grasshopper, and a crayfish

8. Which of the following is a rupture of a major blood vessel?

- A. angina
- B. hypertension
- C. VSD
- D. aneurysm
- E. none of these

9. Which of the following is not an example of mutualism?

- A. ants and acacia trees
- B. clown fish and sea anemones
- C. bacteria living in a cow's rumen
- D. cowbirds laying eggs in other birds nests
- E. all are examples of mutualism

10. The pacemaker of the heart is called the _____ and it is found in the _____.

- A. SA node, left atrium
- B. SA node, right atrium
- C. AV node, left atrium
- D. AV node, right atrium
- E. both C and D are correct

Longer Answer: (30 points total)

1. You are an ecological researcher studying endangered species and find that one of them, the dwarf-brained rat (*Rattus microcephalus*), lives right here in Davidson. You are responsible for determining the population size of this magnificent animal of the on the campus of Davidson College but don't have time to capture all the rats on campus. Describe how you would go about conducting this study. Make sure you point out any assumptions that are implicit to your experimental design. (12 points)
2. Describe, using examples, how modifications of the digestive tracts of vertebrates match their diet (10 points).
3. Describe general latitudinal gradient trends in species diversity and describe possible reasons for the observed trends (8 points).

Shorter Answer: (20 points total)

1. Draw a single graph with curves representing the life-time survivorship probability of a human and a toad. What accounts for the differences between the curves? (4 points)
2. Draw a graph representing the growth curve for a population with an r value of 1 and a K value of 2000. (4 points)
3. Name and describe two cardiac birth defects (4 points)
4. What is biomagnification? Provide at least one example in your answer. (4 points)
5. Provide two examples of mimicry, describe what type of mimicry they represent, and why your examples are good ones. (4 points)