Ichthyology - Fall 2005 – Exam 1 Name _____

Part 1 – Please give short definitions for 10 of the 12 terms listed (3 pts each).

1. Rete Mirabile

2. Haemal spine -

3. Hypaxial Muscles -

4. Bohr Effect -

5. Ammocoetes -

6. Chloride Cells -

7. Poikilotherm vs. Homeotherm -

8. Otolith -

9. Monophyletic – are fish monophyletic?

10. Physostomous -

11. Neuromast -

12. Fin Spines vs. Fin Rays -

Ichthyology Fall 2005 – Exam 1 Name _____

Part 2 – Please answer five of the six short essays (10 points each)

1. Osmoregulatory strategies (salt-water balance) in fishes can be placed into four major strategies – please explain each of these four strategies and how they work in the various fishes.

2. There are three major types of buoyancy regulation in fishes – please tell me what they are and how each of them controls, if they use, gas filling and release. Be sure to include both structures and mechanisms in your explanations.

Ichthyology Fall 2005 – Exam 1 Name _____
Part 2 – Please answer five of the six short essays (10 points each)

3. Please explain what drag is and how the three major types of drag affect swimming in fish. What are three morphological innovations in tunas that are thought to reduce drag?

4. There are numerous groups of fossil fishes – please identify three groups of fossil fishes (Agnathans and/or Gnathostomes) and a major characteristic of each group.

Ichthyology Fall 2005 – Exam 1 Name _____

Part 2 – Please answer five of the six short essays (10 points each)

5. If a fish is comprised primarily of white muscle tissue, has a low aspect ratio and has a physostomous swim bladder, what can you hypothesize about its ecology? (i.e where does it live and what does it eat?).

6. Fish use about 10% of their energy to breath versus 1% in terrestrial organisms. Why? Please discuss the basic structures and mechanisms by which fish carry out gas exchange (respiration). Be sure to explain how gas exchange works and counter current exchange systems.

Ichthyology Fall 2005 – Exam 1 Name _____

Part 3-A (10 pts) – Matching Trees: On the left are ten major types of swimming. Please match best answer on right with left.

_____ Amiiform	A. Wave length less than body length
_____ Subcarangiform	B. Posterior half of body
_____ Rajiform	C. Row with pectoral fins
_____ Thunniform	D. Undulation along anal fin
_____ Anquilliform	E. Tail but cannot move body
_____ Tetradontiforms	F. Dorsal and anal fins synchronously
_____ Labriform	G. Slow undulation of pectoral fins
_____ Ostraciiform	H. Undulation along dorsal fins
_____ Gymnotiform	I. Posterior third flexible
_____ Carangiform	J. Caudal peduncle and tail

3-B. (10 pts) Given this data set where characters are ancestral (0) or derived (1) construct a phylogeny using parsimony and map the characters on to the tree. How many evolutionary steps does this tree require? (10 points).

	CHARACTERS									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Taxa										
A	0	0	0	1	1	0	0	0	0	0
B	0	1	0	0	1	0	1	1	0	0
C	1	0	1	0	0	0	0	0	1	0
D	0	0	0	0	1	0	1	1	0	1
E	1	0	1	0	0	1	0	0	0	0
Out	0	0	0	0	0	0	0	0	0	0

Bonus: What are the three Great Lakes of Africa and what is the most common family (in terms of species diversity) found there (spelling counts).