

Name _____ (1.5 pts)

EEB 3273/Schwenk
Fall 2008

LECTURE EXAM 1 (100 pts)

(1) (4.5 pts) List 3 synapomorphies for Chordata and very briefly describe what each one is.

a. _____

b. _____

c. _____

(2) (2 pts) Fill in the blanks: Annelids, arthropods and mollusks are all _____ stomes, which means that the blastopore of the early embryo forms the _____ in the adult, in contrast to vertebrates.

(3) (16 pts) True or False (T or F)

_____ Geoffroy and Cuvier were early evolutionists

_____ Darwin believed that one species could transform into another

_____ 'Phenotype' includes behavior and function, as well as anatomy/morphology.

_____ All individuals in a population have exactly the same phenotype.

_____ 'Atomization' is the process whereby whole organisms are broken down into 'characters'.

_____ Characters that are sympleiomorphic are not homologous.

_____ Aristotle's 'scala naturae' organized living things according to 'complexity'.

_____ The gills in a shark are analogous to the gills in a lobster.

_____ The columella in a lizard is homologous to the hyomandibula of a shark.

_____ According to morphological evidence, cephalochordates are the closest living relatives to craniates.

_____ If characters in two species look almost identical, then they must be homologous.

_____ A 'reversal' refers to when a character changes from a derived state back to the ancestral state.

_____ Composite materials are generally stronger than uniform materials.

_____ Bone is stronger than cartilage because inorganic molecules of hydroxy apatite fill the matrix.

_____ Bone is stronger than cartilage, but cartilage is more elastic.

_____ The periosteum is composed primarily of elatin fibers.

- (4) (54 pts, 6 pts each) *Compare and contrast* the following pairs of words. The words have some sort of *relationship*—it might be ***anatomical*** (e.g., they are physically connected), ***functional*** (e.g., they both perform the same function in different animals, or they both work together in a single animal to perform a particular function), ***evolutionary*** (e.g., they are homologues) *or otherwise*. In your answer **YOU MUST SHOW THAT YOU UNDERSTAND EACH TERM ON ITS OWN AND ESPECIALLY HOW THEY ARE RELATED TO ONE ANOTHER.**

CHOOSE 2 OF THE FOLLOWING 11 WORD COMPARISONS (LEAVE 2 BLANK)

- (a) notochord—vertebra
- (b) evolution—homology
- (c) Urochordata—Cephalochordata
- (d) bone—cartilage
- (e) endochondral—dermal

(f) epidermal placode—chondrocranium

(g) palatoquadrate—articular

(h) amphioxus—ammocoetes

(i) analogy—phenotype

(j) gills—visceral skeleton

(k) archetype—evolution

**THERE WOULD BE A DRAWING HERE BUT IT IS
NOT PART OF THE DOCUMENT – TYPICAL HEAD SKELETON I DREW IN LECTURE
THAT LOOKS KIND OF LIKE A SHARD SKELETON**

(5) (12 pts) LABEL THE DIAGRAM OF THE ANCESTRAL/EMBRYONIC HEAD SKELETON ABOVE

A. _____

B. _____

C. _____

D. _____

E. _____

F. _____

G. _____

H. _____

I. _____

1. Name of visceral arch 1: _____

2. Name of viscera arch 2: _____

3-5. Name of visceral arches 3-5: _____

(6) (9 pts) What are the three components of a connective tissue (in general) and what are they specifically for bone and cartilage (fill in the table)

IN GENERAL	IN BONE	IN CARTILAGE
1.		
2.		
3.		