

Please **read the questions carefully** and be as specific as possible in your answers.

Section I - Short Answer, 3 points each.

1. Define or describe an *exocrine gland*.
  
2. Name two vertebrate structures that may contain *enamel*.  
\_\_\_\_\_ and \_\_\_\_\_
  
3. Cells of the dermis are rich in collagen fibers, while cells of the epidermis are rich in  
\_\_\_\_\_
  
4. An immovable joint between bones is called a \_\_\_\_\_
  
5. Cartilage that is “glassy”, has few fibers and may be replaced by bone is called  
\_\_\_\_\_
  
6. Name the cells that produce the matrix of bone \_\_\_\_\_
  
7. Define/describe a *vestigial* structure
  
  
8. Name the most distal bone(s) of the autopodium in tetrapods \_\_\_\_\_
  
9. The muscular system performs a number of *general* functions; name three
  - (a) \_\_\_\_\_
  - (b) \_\_\_\_\_
  - (c) \_\_\_\_\_
  
10. Name the general type of muscle that affects blood vessels and other internal organs  
\_\_\_\_\_
  
11. Is the following sentence true or false? Among fast twitch muscle fibers, those that produce the greatest force are the most resistant to fatigue. Explain your answer.
  
  
12. Define/describe the action of an *adductor* muscle

13. Name the embryonic germ tissue that *somatic* muscles are derived from (please be specific)

\_\_\_\_\_

14. Name three *types* of muscles derived from the splanchnic portion of the hypomere

(a) \_\_\_\_\_

(b) \_\_\_\_\_

(c) \_\_\_\_\_

15. The density of water = \_\_\_\_\_

The density of muscle = \_\_\_\_\_

The density of bone = \_\_\_\_\_

16. Of what use would lobed fins have been to early vertebrates moving on land? Explain.

17. What is the name given to vertebrates adapted for running \_\_\_\_\_

What is the name given to vertebrates adapted for digging \_\_\_\_\_

What is the name given to vertebrates adapted for hopping \_\_\_\_\_

18. *Radial* pterygiophores of fins are homologous with what part of the tetrapod limb?

\_\_\_\_\_

19. Name the (developmentally defined) cranial region where the *ethmoid plate* and the *olfactory capsule* originate \_\_\_\_\_

20. Define/describe a *synapsid* skull

21. The *quadrate* bone in the jaw joint of reptiles evolved into the \_\_\_\_\_ of mammals, while the reptilian *articular* became the \_\_\_\_\_ in mammals.

22. Name the structural adaptation in the skull that allows mammals (but not reptiles) to chew and breath at the same \_\_\_\_\_

23. Define/describe a heterocercal tail

24. Name the structural part of an individual vertebra within which the dorsal nerve cord is enclosed? \_\_\_\_\_

25. Define/describe the *plantigrade* form of vertebrate limb.

Section 2 - Longer Answer.

[Not covered for this exam Spring 2002]

1. Briefly describe the two major theories for the evolution of flight in birds. Indicate which one is currently favored and why (6 points).

2. Briefly describe the anatomical characteristics of each of the following structures: (a) antlers of a deer, (b) horns of a cow, (c) horns of a giraffe, (d) horns of a rhinocerus (6 points).

3. Make a labeled diagram showing the different levels of organization of muscle tissue. Include all structures from the molecular level to a whole muscle (13 points).