

**ANSWER QUESTIONS 1-4 WITH REFERENCE TO THE PHYLOGENY DRAWN BELOW**

(1) (6 pts) Provide the names of the node groups A, B and C

- A.
- B.
- C.

(2) (4 pts) Give the stem group names for the lineages indicated by the arrows labeled D and E.

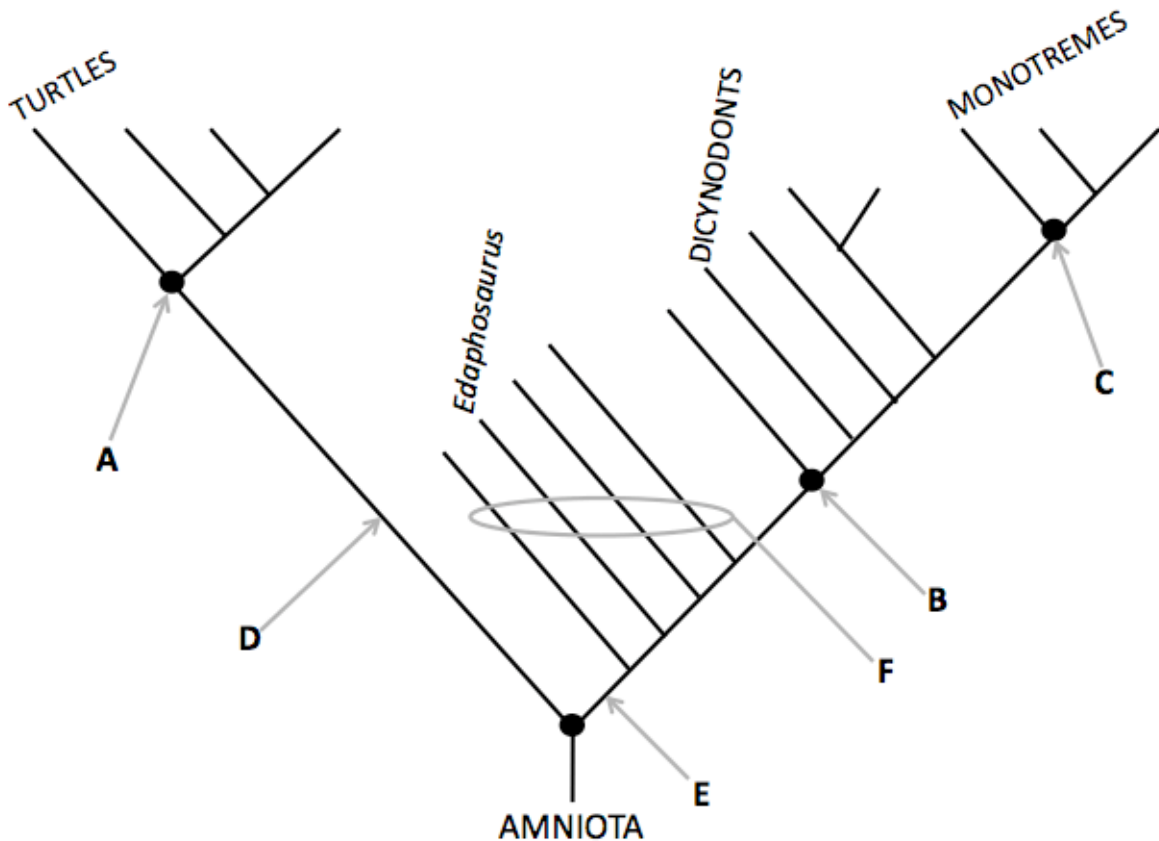
- D.
- E.

(3) (2 pts) What is the informal name given to the group of lineages circled and labeled F?

F.

(4) (8 pts) Answer the following questions based on what the common ancestor of the two main amniote lineages would have been like (the black dot just above the name "AMNIOTA").

- a) Did it masticate its food?
- b) Did it have hair?
- c) What kind of posture/limb position did it have?
- d) Was it ectothermic or endothermic?
- e) Did it have a masseter muscle?
- f) Did it have ribs on its neck vertebrae?
- g) Did it have a secondary palate?
- h) Did it lay eggs or give birth to live young?



**(5)** (3 pts) Give the crown group definition of “Mammalia.”

**(6)** (8 pts) Place a **T (True)** or an **F (False)** next to the following statements.

\_\_\_\_\_ Small animals heat up and cool down more slowly than large animals.

\_\_\_\_\_ Enlargement of the coronoid process is associated with changes in the action of the temporalis muscle related to the evolution of mastication

\_\_\_\_\_ Living reptiles and mammals extract the same amount of energy per unit of food.

\_\_\_\_\_ A secondary palate evolved in response to selection for breathing efficiency to support high activity levels.

\_\_\_\_\_ Sagittal (ventral) limb position is correlated with lateral undulation during locomotion.

\_\_\_\_\_ Living reptiles can afford slow gut passage rates because they are ectothermic.

\_\_\_\_\_ The area of the sail in early ‘sail-back’ synapsids is correlated with body weight, not length

\_\_\_\_\_ Character-based definitions (e.g., animals with only one bone—the dentary—in the lower jaw) of Mammalia are bogus (i.e., without merit)

**(7)** (2 pts) What is the significance of villi and microvilli in mammalian guts?

**(8)** (7.5 pts) Name the 5 regions of the mammalian vertebral column and very briefly describe a key feature of each.

**(9)** (4 pts) What is the significance of **buttocks** in the evolution of synapsids?

**10)** (28 pts/4 pts each) **Choose 7 of the following 9 words** and write a brief explanation of what it is and/or why it is significant. *A few sentences to a paragraph for each should be plenty.*

heterodonty  
cellular respiration  
masseter

*Edpahosaurus*  
secondary palate  
dinocephalian

mastication  
inertial homeothermy  
dicynodont