

EEB 3254/5254 SAMPLE LECTURE EXAM QUESTIONS

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

(1) (5 pts) Provide the names of the node groups A, B and C

- A. (2 pts)
- B. (1 pt)
- C. (2 pts)

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

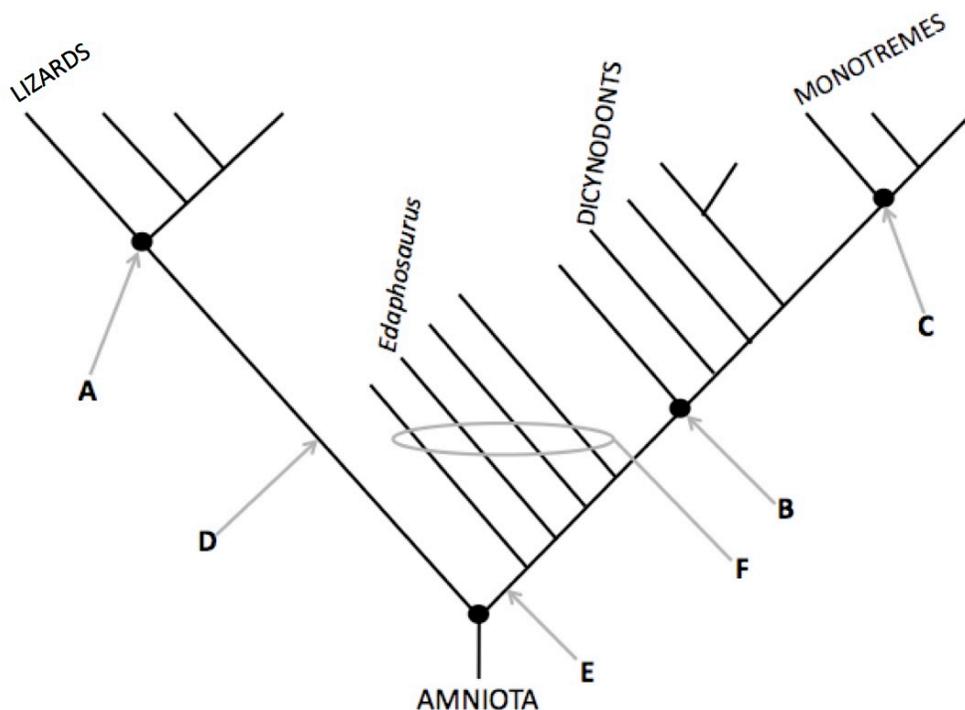
- D.
- E.

(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 (D and E) 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 a homeotherm? _____
- 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) What is ‘the crown group definition’ of Mammalia?

(6) (2 pts) What would be an *alternative* way to define Mammalia? (you don’t have to give the actual definition, just how it would be defined, i.e., on what basis would the definition be made)

(7) (16 pts) Place a **T** (True) or an **F** (False) next to the following statements.

_____ Small animals heat up and cool down more quickly than large animals.

_____ ‘Puncture-crushing’ is a form of chewing that reduces food to tiny particles.

_____ 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.

_____ 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.

_____ The evolution of modern mammalian characters occurred gradually and sequentially along the main synapsid lineage.

_____ Dr. Schwenk is a eutherian *and* a cynodont.

_____ The presence of a cochlea distinguishes monotremes from all other mammals

_____ Platypuses retain mostly ‘primitive’ traits and therefore probably look very much like the common ancestor of all living mammals.

_____ A fundamental difference between mammals and all other vertebrates is the presence in mammals of pharyngeal musculature.

_____ Calling eutherian mammals ‘placentals’ is misleading because marsupials also possess a placenta.

(8) (6 pts) What is the significance of **buttocks** in the evolution of synapsids?

IN THE ACTUAL EXAM YOU WOULD BE GIVEN ENOUGH ROOM TO ANSWER THE QUESTION ON THE EXAM SHEET

(9) (6 pts) What is **inertial homeothermy** and why is it important?

(10) (5 pts each) Compare and contrast the following word/phrase pairs. In other words, *in a very brief and concise paragraph*, how are the two words/phrases related—i.e., why did I put them

together? The relationship between them might be anatomical, functional and/or evolutionary. A perfect answer will show not only that you understand what each term means, ***but also how they are connected/related.***

IN THE ACTUAL EXAM YOU WOULD HAVE SOME CHOICE ABOUT WHICH ONES TO ANSWER

endothermy—occlusion
gut surface area—endothermy
respiration—lateral undulation
puncture crushing—mastication
palate—bite force