
FINAL TEST – STUDY SHEET

THE THIRD TEST

Part 1 – multiple choice or matching (40%)

Part 2 – short answer (30%)

Part 3 – long answer (30%)

Below is a review of the lecture material covered in the last section of the course. The final test for this course will simply act as a fourth test...it is the same length as the other exams and is worth the same amount of points in your overall grade. This test will, therefore, not serve as a comprehensive final exam. But remember, although I will not *specifically* ask questions on this exam regarding material in the first section, much of our understanding of the geological sciences is based in our understanding of how the modern Earth works, and the accumulation of tools that allow us to interpret ancient environments. The review sheet consists of a series of questions regarding the lecture material. Most of these questions can be answered in a couple of words or phrases, but for the purpose of studying, it would be helpful if you try to answer them in as much detail as possible. You might try to answer the questions, first, without looking at any notes, then move to your textbook and notes to help you answer them in more detail. Remember, you are not required to turn in any answers for these – this is for your own benefit in studying.

(hint) Do you know your geologic time scale? See Figure 1-13 in your textbook. Also make sure to know the relative order of evolutionary events in the Early Earth (see chapter facings for chapters 11, 12, 13).

SECTION 10 – PALEOZOIC LIFE AND ENVIRONMENTS (READ CHAPTERS 13, 14, AND 15)

- what characteristic developmental themes marks the evolution of the earliest fishes?
- what are the advantages to having a phosphatic skeleton, as is seen in the bony fish?
- describe opportunistic evolution and give two examples from early fish.
- what lines of evidence suggest that land vertebrates evolved from the lobe-finned fish?
- who colonized land surfaces first – microbial populations, plants, invertebrates, or vertebrates?
- were amphibians able to fully colonize terrestrial environments? why or why not?
- what are the primary differences between reptiles and their amphibian ancestors?
- what are the advantages of an endothermic metabolism (or disadvantages of being ectothermic)?
- what were the dominant reptiles in the Permian?
- how did differing and diverse skull structures help reptiles to be competitive against amphibians?

SECTION 11 – THE MESOZOIC (READ CHAPTERS 16 AND 17)

- why did reptiles dominate terrestrial landscapes throughout the Mesozoic?
- what lines of evidence suggest that mammals evolved from therapsid reptiles?
- how is the mosaic evolution of mammals different than the opportunistic evolution seen in fish?
- what lines of evidence suggest that dinosaurs were endothermic? ectothermic?
- what evolutionary pressures may have influenced the evolution of feathers on dinosaurs?

SECTION 11A – A TALE OF TWO EXTINCTIONS (READ CHAPTERS 15 AND 17)

- describe the geologic and biologic evidence supporting the current hypoxia hypothesis for the Permian extinction.
- what animals were most affected by the Permian extinction, why?
- how might the hypoxia hypothesis be tested by using C-isotopes?
- describe the geologic and biologic evidence supporting the bolide hypothesis for the Cretaceous extinction.
- why might plant and animal diversification occur most rapidly in the interval directly following a mass extinction?
- describe how the Permian and Cretaceous extinctions affected plant and animal life in terrestrial environments.

SECTION 12 – THE PALEOBOTANICAL RECORD (REVIEW CHAPTERS 14 AND 15)

- what evolutionary adaptations were important to the diversification of plants in terrestrial environments?
- describe several mechanisms by which angiosperms ensure seed dispersal.
- what is the primary difference between gymnosperms and angiosperms?
- why is the angiosperm lifecycle more apt to result in rapid reproduction than that of gymnosperms?
- what type of leaf structures might you expect in warm/cold/wet/dry environments?
- what were the dominant plant types in the Silurian? Carboniferous? Cretaceous?
- how can plants be useful in determining past climatic change?

SECTION 13 – CENOZOIC EVOLUTION OF LIFE AND CLIMATE (READ CHAPTERS 18, 19, AND 20)

- give as many examples as you can of the effect that plate tectonics played in the Mesozoic and Cenozoic distribution and evolution of land animals.
- describe the biological and environmental (climatic) effects of the closing of the isthmus of Panama.
- describe the biological and environmental (climatic) effects of establishing the circum-polar current.
- why are marsupials dominantly found in southern hemisphere continents?
- describe how seafloor magnetic striping can help determine the direction and rate of plate tectonic movement.
- describe the driving forces behind thermo-saline ocean circulation.
- how did changes in ocean circulation lead to buildup of polar ice caps in the Cenozoic?