City College of San Francisco Spring 2013
GEOG 1—Physical Geography
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Third Midterm Examination Study Questions

The questions below will help you focus on the most important concepts presented in class as you prepare for the third midterm exam. These questions don't necessarily cover all of the material on which you may be tested (nor will you necessarily be tested on all of the material noted below), but these questions are a good starting point for studying. As you prepare for the exam, I recommend that you ***write down the answers*** to these questions ***in your own words*** (not just copied from the textbook, and certainly not from Wikipedia!) to ensure that you understand the material completely.

1. Contrast the concepts of "internal" and "external" processes.
2. In the context of geomorphology, what is meant by the term *relief*?
3. How does the *doctrine of uniformitarianism* help us understand the history of Earth?
4. How is a *mineral* different from a *rock*?
5. Describe the general differences among *igneous*, *sedimentary*, and *metamorphic* rocks.
6. What is the difference between a *plutonic* (intrusive) igneous rock and a *volcanic* (extrusive) igneous rock?
7. Why do plutonic rocks have larger mineral crystals (mineral crystals large enough to see with the unaided eye) than most volcanic rocks than form from the cooling of lava?
8. What are the main differences between *granite* and *basalt*? (Hint: There are two major differences.)
9. Why do most sedimentary rocks form in flat, horizontal layers?
10. Why are metamorphic rocks often found in contact with plutonic rocks such as granite? (Hint: Consider the source of the heat and/or pressure that can cause such *contact metamorphism*.)
11. Over long periods of time, how can the minerals in one rock end up in a different rock (or a different kind of rock)? In other words, explain the *rock cycle*.
12. Briefly describe the following layers of Earth: *crust*, *mantle*, *outer core*, and *inner core*.
13. In the context of plate tectonics, describe the differences between the *lithosphere* (the "plates") and the *asthenosphere*.
14. What were some of the reasons that Alfred Wegener's theory of "continental drift" was rejected for so long?
15. What lines of evidence confirm that *seafloor spreading* has been taking place and that the positions and configuration of continents and ocean basins changes over geologic time? You should be able to describe and explain at least one line of evidence found on the ocean floors that verifies seafloor spreading, and at least one line of evidence found on the continents that indicates that the positions of continents were different in the geologic past.
16. What general process taking place within Earth's mantle is responsible for lithospheric plate movement?
17. What is the general relationship of global earthquake activity to plate boundaries?
18. Describe the fundamental differences among *divergent*, *convergent* and *transform* plate boundaries.
19. Describe and explain the tectonic activity, volcanic activity and general topographic features of the two kinds of divergent plate boundary: *midocean ridges* and *continental rift valleys*. Mention at least one present-day example of both of these kinds of divergent boundary.
20. Describe and explain the tectonic activity, volcanic activity and general topographic features of the three kinds of convergent plate boundary: *oceanic-to-continental plate subduction*, *oceanic-to-oceanic plate subduction*, and *continental plate collision*. Mention at least one present-day example of each of these kinds of convergent boundary.
21. Why can oceanic lithosphere be subducted while continental lithosphere cannot?
22. How does the San Andreas Fault system fit in with plate tectonics?
23. Why are deep-focus earthquakes (those originating many hundreds of kilometers below the surface) associated with subduction zones, but not with divergent boundaries and transform boundaries?
24. Why is there such a concentration of volcanoes and earthquakes around the margin of the Pacific Ocean (a region referred to as the *Pacific Ring of Fire*)?
25. What is a *hot spot*? Name at least one present-day example of a hot spot location.

26. How does the idea of a *mantle plume* explain the existence of hot spots?
27. In what ways *don't* hot spots fit in with the basic model of plate tectonics and plate boundaries?
28. In what ways have hot spots been used to verify that plate motion is taking place?
29. What is the difference between a *hot spot trail* and a volcanic *island arc*? Provide one example of each.
30. What is a *terrane* and how does one form?
31. What is a *syncline*? What is an *anticline*?
32. How is it possible for a syncline to be associated with a topographic ridge and for an anticline to be associated with a topographic valley?
33. Contrast the differences in stress direction and displacement among the four basic kinds of faults: *normal faults*, *reverse faults, thrust faults,* and *strike-slip faults*.
34. Describe and explain the formation of landforms that result from normal faulting (such as *grabens, horsts*, and *tilted fault block mountains*).
35. Describe and explain the formation of landforms that result from strike-slip faulting (such as *linear fault troughs, sag ponds*, and *offset streams*).
36. Define the following terms: *magma*, *lava*, and *pyroclastics*.
37. Explain the general differences in silica content and style of volcanic eruption (i.e., quiet lava flows vs. explosive eruptions of pyroclastics) associated with basaltic magma (such as forms the volcanic rock basalt), andesitic magma (such as forms the volcanic rock andesite), and rhyolitic magma (such as forms the volcanic rock rhyolite and the plutonic rock granite).
38. Describe and explain the general formation, shape and structure of the following kinds of volcanic peaks: *shield volcanoes*, *composite volcanoes*, and *plug domes* ("lava domes").
39. Describe and explain the origin and characteristics of *volcanic mudflows* ("lahars") and *pyroclastic flows*.
40. You should be able to locate the following features mentioned in lecture on a world map and understand their significance in the context of plate tectonics and/or internal processes. For example, if the feature is located along a plate boundary, you should know which kind of plate boundary (transform, divergent, convergent, etc.); if associated with faulting, what kind of faulting (normal, strike-slip, etc.); if associated with volcanic activity, what kind of volcanism (basaltic vs. andesitic lavas, shield vs. composite volcanoes, quiet vs. explosive eruptions, subduction zone vs. hot spot, etc.); if associated with earthquakes, what depths of earthquakes (shallow-focus and deep-focus, or only shallow-focus, etc.):

    Aleutian Islands, Aleutian Trench, Andes mountains, the Cascade Range, East African Rift Valley, East Pacific Rise (in the Pacific Ocean west of South America), Hawaiian Islands, Himalayas, Indian subcontinent, Indonesian Islands, Japan, Mariana Islands, Mariana Trench, Mid-Atlantic Ridge, Mount Shasta, Peru-Chile Trench, The Philippines, Red Sea, San Andreas Fault system, Sierra Nevada mountains.
41. Briefly define the following terms: *weathering*, *mass wasting*, and *erosion*.
42. What is the difference between a *joint* and a *fault*?
43. What role can joints play in the weathering of rock?
44. What are the general differences between *mechanic weathering* and *chemical weathering*?
45. Explain the mechanical weathering process of *frost wedging*.
46. Explain the mechanical weathering process of *exfoliation* ("unloading") that is responsible for features such as *exfoliation domes* in the Sierra.
47. Briefly describe at least one chemical weathering process.