Unit III "Earthquakes in Bay Area" Review Questions

The exam will cover material presented in meetings #17 through #21 (Mon. Oct. 22 through Fri. Nov. 9) and Activities 16 through 20.

Here is a list of potential questions for your exam. These questions are based on materials presented in **lectures, activities, including videos and animations, and required reading assignments and postings by students in the discussion area**.

1. Draw a map showing the major fault zones in the bay area, label each fault zone, and discuss the probability of a magnitude 6.7 or great on each
2. Describe the general distribution of earthquake epicenters in the bay area.
3. Describe the origin and evolution of the transform plate boundary in the bay area.
4. Describe 5 lines of scientific evidence that demonstrate the existence of active fault zones in the bay area that can generate earthquakes.
5. Describe six features along the San Andreas fault system, beginning at its southern end in the Gulf of California to its northern termination where it meets the Cascadia subduction zone in northern California.
6. What are three sources of information that can be used to understand the frequency of large earthquakes in the bay area prior to 1900?
7. How has the frequency of earthquakes in bay area changed as a result of the 1906 earthquake and why?
8. How was the infrastructure of society damaged in the 1906 and 1989 earthquakes and what does this mean for preparedness plans for future earthquakes?
9. What is the problem with using animal behavior to predict earthquakes and describe a piece of evidence to support your answer?
10. Describe three factors or properties that make fault zone behavior, prior to an earthquake, difficult to measure and predict.
11. What is meant by characteristic earthquake and recurrence interval?
12. Why was Parkfield, California selected for major earthquake study and what are the results of this study (at least so far)
13. Describe five methods or measurements that have been used (or are being used) to study the generation of earthquakes in the Parkfield experiment.
14. Why is it assumed that there may be precursors that foretell the onset of an earthquake?
15. What is the record, at least up to this point, of measuring events that may precede a major earthquake?
16. What factors or measurements are incorporated and integrated into a scientific forecast of the probability of a major earthquake, magnitude 6.7 or greater, in the bay area over the next 30 years?
17. How do scientists study determine the past history of earthquakes along a fault, especially events prior to 120 years ago?

18. If earthquakes cannot be predicted, at least not yet, how else can scientists study the potential damage in a region? Give three specific examples.
19. Distinguish between the science and pseudoscience by citing an example related to earthquake prediction.
20. What is the difference between ground rupture, ground shaking and liquefaction?
21. Why is the earthquake research community disappointed by the recent outcome of the l'Aquila trial in Italy?
22. Describe the factors that influence the intensity of ground shaking in a specific region during an earthquake.
23. How are scientists attempting to provide information to the general public about the potential damage during a large earthquake?
24. What event resulted in the development of earthquake science in the U.S. and describe the scientific investigations conducted immediately after this event?
25. Describe the objectives and methodology of paleoseismology.
26. Describe a shake map and how is it used by scientific and emergency response teams?
27. Describe the SAFOD experiment and its objectives?
28. Describe the probability for a major earthquake along the Sa Andreas fault system in California and how this probability is determined.
29. How are public official and scientists preparing for a major earthquake in California?
30. How is the San Andreas fault being monitored in the bay area in order to offer an earthquake warning system?
31. What is the evidence (give at least four) for recent movement along the Hayward fault in the bay area and why is this fault considered the deadliest in the bay area, if not the country?
32. Describe how recurrence interval is determined and what is this interval for the Hayward fault?
33. Describe how scientists measure the movement of a fault each year and how is this movement used in earthquake probability estimates?
34. Describe the conditions that gave rise to intense ground shaking in the Marina District in San Francisco during the 1989 Loma Prieta earthquake.
35. Describe three types of web-based mapping tools that assist citizens in understanding the risk of damage to their bay area homes in the next major earthquake. What do these maps attempt to show?