**ES486 Subsurface Geologic Mapping Video Review Exercise Name\_\_\_\_\_\_\_\_\_\_\_\_**

Watch the Youtube Video located at <https://www.youtube.com/watch?v=qQdITVaqRXk> and answer the following questions.

1. What are the two broad categories of subsurface exploration of petroleum? What are the logistical problems encountered with finding oil in the subsurface.
2. How do exploration geologists compare to petroleum engineers? What are their goals and objectives, respectively?
3. What is the primary type of drilling method for petroleum.
4. List the three primary types of well logs used in the petroleum industry.
5. Describe the process of collecting wireline logs. Draw a sketch illustrating the process.
6. List and discuss the three main types of wireline logging.
7. User internet resources to define or describe the following terms, draw a sketch to illustrate, what types of information are gathered with the techniques:
   1. Dip meter
   2. Sonde
   3. Spontaneous Potential logs
   4. Resistivity Logs
   5. Acoustic Velocity logs
   6. Gamma Logs
   7. Neutron Logs
8. How are lithologic logs created? Draw a sketch to illustrate your answer.
9. What is the range of lag time between drilling horizon and return to the surface? How are lag times determined at the drill rig.
10. What is the difference between well core and well cuttings, what are the pros and cons of each?
11. Describe the process of “mud logging”
12. How does cable tool drilling differ from rotary drilling?
13. What types of information is recorded on drillers logs.
14. True or False: drill holes are always drilled perpendicular to the Earth’s surface.
15. True or False: multiple wells can be drilled from a single drilling platform in the ocean.
16. Why are stratigraphic marker horizons important for cross-well correlation.
17. List and describe the types of subsurface contour maps are used to characterize petroleum environments.
18. Draw a structure contour map showing a “structural high”, how do these areas related to petroleum potential.
19. Where is the “Kelley bushing” located on a drilling rig? How is it used for well logs.
20. Draw a generalized structure contour map showing a northwest trending anticline, with a steep northeastern limb, and a more gently dipping southwestern limb.
21. What are the effects of faults on structure contour lines? Draw a generalized sketch to illustrate the effect.
22. True or False: normal faults result in missing vertical stratigraphic sections. Draw a sketch to illustrate the answer.
23. True or False: reverse faults result in repeated vertical stratigraphic sections. Draw a sketch to illustrate the answer.
24. Define the term “throw” with respect to a fault.
25. What are the minimum number of wells required to draw a structure contour map.
26. Draw a cross-sectional sketch of a normal fault showing drag folds on the hanging wall.
27. Draw a cross-sectional sketch of a growth fault showing fold patterns that form on the hanging wall side.
28. What is the difference between a normal fault and growth fault?
29. Define a sketch an example of an isopach map.
30. Describe some example uses of isopach maps in petroleum exploration.
31. What corrections are needed for creating isopach maps on dipping beds. What is the difference between isopach and isochors maps, draw sketches to illustrate your answer.
32. Write the equation for determining petroleum reserve estimates from isopach maps in sandstone reservoirs. What factors need to be considered.
33. True or False: proximal facies tend towards sandstone dominated, distal facies tend toward limestone and shale.
34. Write the equation for determining a clastic ratio for stratigraphic intervals in wells. List all of the variables.
35. What is a “subcrop” map?
36. How are isotherm and pressure maps used to enhance petroleum recovery.
37. Write a 4 sentence summary of why subsurface mapping is important for the exploration of petroleum.