**ES486 Petroleum Geology Video Exercise Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Part 1. Introduction to Petroleum Geology / Career Overview**

Watch the video located at the following URL and answer the questions below. Use your favorite web search tools (Google, Wikipedia, etc.) to augment your answers as needed. Include sketches and/or image capture where required.

<https://www.youtube.com/watch?v=Tj0FQ1nhn7I>

1. What is the role of geologists and geophysicists in the petroleum industry?
2. What is the primary tool that is used to extract oil from deep inside the Earth?
3. Where is the best place to look for oil and gas inside the Earth?
4. What is a “wildcat”?
5. What are the two primary pieces of information from drill holes that are used to assess the occurrence of oil?
6. True or False: it is very cheap and inexpensive to search for oil?
7. List and briefly discuss three methods used for exploration of petroleum in the subsurface.
8. Draw a sketch or provide image capture illustrating how seismology is used for the exploration of oil and natural gas.
9. What is a “prospect”?
10. List the types of scientists and team members that are used in the search for and production of hydrocarbons.
11. Compare and contrast the training and professional differences / similarities between geologists and geophysicists.

**Part 2. Overview of Petroleum Geology**

Watch the video located at the following URL and answer the questions below. Use your favorite web search tools (Google, Wikipedia, etc.) to augment your answers as needed. Include sketches and/or image capture where required.

<https://www.youtube.com/watch?v=Fp-OvwbnK0U>

1. What is the primary source of organic matter that forms hydrocarbons in the rock record.
2. True or False: terrestrial organisms are most associated with the production of oil and gas.
3. True or False: the Cretaceous period was associated with global high sea level stands and ocean basins.
4. Describe the process of hydrocarbon formation.
5. What is the simplest of hydrocarbon molecules?
6. Examine the data table at time mark 4:36. Draw a sketch showing an X-Y graph with Temperature in Celsius on the X-axis; and Depth in Meters on the Y-axis. Show the approximate relationship between depth below the Earth’s surface and rock temperature.
7. What is the optimal depth and temperature at which soil is produced in the subsurface environment?
8. True or False: oil forms in the organic-rich source rock, and does not migrate under pressure.
9. Draw a sketch of an anticlinal trap structure in cross section; showing where hydrocarbons occur.
10. Examine the sedimentary rock core samples shown at time mark 6:31 (shale, sandstone, limestone, dolomite). Which rock type shows the highest permeability and infiltration rate, which shows the lowest rate?
11. Draw a sketch showing faulting associated with stretching of the Earth’s crust.
12. Ture or False: salt deposits are very malleable and deformable in the subsurface.
13. What are the primary subsurface elements required for the economic accumulation of petroleum hydrocarbons in the subsurface.
14. Examine the cost-benefit ratio diagram shown at time mark 11:01. Provide a description of the cost to drill a well vs. the probability of successful oil production and profit margin.
15. Where is the Big Horn basin located in the U.S. What are its dimensions? What are the surface elevations.
16. What are the ages of the petroleum producing horizons in the Big Horn Basin.
17. What type of rock structure is exemplified in the Big Horn Basin.
18. What is biostratigraphy and why is it important.
19. Provide some examples of remote sensing technology used in petroleum exploration.
20. Draw a sketch and provide a description illustrating the difference between P wave and S waves.
21. Describe the process of seismic exploration.