**ES486 Lecture Review Exercise Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**University of Delft Lecture Review Questions: Basin Types, Exploration and Development**

Watch the video lecture at the following URL:

<https://ocw.tudelft.nl/course-lectures/pgeo-l7-basin-types-explore-produce/?course_id=12985>

and review the following related lecture slides:

<https://people.wou.edu/~taylors/es486_petro/PGeo_L7_Petroleum_Geology_-_Lecture_7_08.pdf>

Answer the review questions below. Use internet search resources as needed to augment your answers. Provide sketches or image-capture diagrams where required.

1. View the video introduction around time mark 03:00, what is a “sedimentary basin”, how is it defined by the professor? Along these lines, what does the phrase “source to sink” refer to?
2. Examine slide 3, list the three primary types of sedimentary basins recognized in the presentation. Using internet search tools, briefly describe the difference between the 3 basin types.
3. How do rift basins compare to collisional subduction zone basins? What types of tectonic forces are at play for each?
4. Discuss the difference between the concepts of “post-depositional” vs. “syn-depositional” basins.
5. Examine slide 6 with a case study from Niger Delta area of Africa. In looking at the cross section, what are the primary types of structural geology features associated with this region? (folds? Faults? What type of faults? Normal or reverse?)
6. Examine slide 7 case study from West Africa, using internet resources, discuss the differences between the concepts of transgressive vs. regressive sequences? How are reach formed in relation to eustatic sea-level change?
7. Examine Slide 8 case study from Gulf of Mexico (southern U.S.). Based on the map and cross-section along line A-A’, describe the age relationships of the sedimentary deposits when transitioning from north (near A) to south offshore in the basin (near B). What formation forms the lower most layer in the stratigraphic succession?
8. Examine slide 9 and 10 with case study illustrations of the North Sea petroleum region in Europe. What are the dominant types of structural traps prevalent in this region?
9. Examine slide 12, with case study from the north slope of Alaska – Prudhoe Bay region. What are the dominant types of structures depicted in cross-section. Do these structures result from compression or tension in relation to tectonic forces? What are the dominant types of faults illustrated in this regional cross section?
10. Examine slide 14 case study of southern California petroleum producing region. What is the style of plate tectonic setting associated with this region? How does it compare to Oregon and the Pacific Northwest? What re the main reservoir rocks in this region.
11. Examine slides 20 through 24 that provide an overview of the main exploration methodologies. Using the slides and internet search resources, briefly describe the following exploration methods:
    1. Remote Sensing
    2. Gravimetry
    3. Magnetometry
    4. Seismic Reflection
12. Examine slide 28. List the primary oil prospect factors that are used by geologists to determine the probability of successful discover of economic quantities of petroleum hydrocarbons.
13. From the video and internet resources, describe the difference between exploration drilling and production drilling as related to the petroleum game.
14. Examine slide 34 with a summary table showing estimated existing oil reserves contained in various petroleum basins of the world. Answer the following questions:
    1. What does the unit “BOE” stand for?
    2. How many U.S gallons are contained in one “BOE”?
    3. List the top two oil reserves in the world? What are their values in BOE and where are they located?
    4. List the top three oil reserves in the USA. What are their values in BOE and where are they located?