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

**University of Delft Lecture Review Questions: Migration from Source to Reservoir**

Watch the video lecture at the following URL:

<https://ocw.tudelft.nl/course-lectures/pgeo-l4-migration-source-reservoir/?course_id=12985>

and review the following related lecture slides:

https://people.wou.edu/~taylors/es486\_petro/PGeo\_L4\_Petroleum\_Geology\_-\_Lecture\_4\_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. From the video introduction: Define the term “migration” as it is used in petroleum geology.
2. List the three primary fluids that are found in the subsurface petroleum environment.
3. Distinguish between the terms “meteoric water” and “connate water”, what is the primary chemical difference between the two.
4. True or False: the process of migration of oil and gas from source rocks to reservoir rocks is very well known.
5. True or False: in most sedimentary depositional systems, sediments are saturated with water when they are buried.
6. Examine slide 5: Discuss the general relationship between depth of rock burial and salinity of formation waters contained therein. Provide a hypothesis as to why this relationship exists?
7. True or False: the lower Cretaceous time period is older than the Jurassic.
8. Discuss the general relationship between depth of rock burial vs. temperature, pressure and porosity. What happens as rocks are buried at deeper depths during sedimentary basin subsidence?
9. What is thought to be the primary driver of forcing hydrocarbons from low-permeability shale source rocks in the subsurface?
10. List two pieces of evidence that support the theory of oil migration out of source rocks to reservoir rocks.
11. Provide a brief geological explanation for the existence of the La Brea Tar Pits in southern California.
12. Examine slide 13, summarize the relationships between the X axis and the two Y axes on the graph depicted. Provide a brief hypothesis of what drives this relationship in the subsurface environment over geology time.
13. Examine slide 15, summarize the basic premise of the “migration paradox” and why it is a controversial topic.
14. List the 4 mechanisms presented as processes that lead to oil and gas migration.
15. Examine slides 16 through 20, and follow the discussion on the corresponding video, provide a summary description of the differences between the concepts of primary migration vs. secondary migration.
16. True or False: organic rich shales are commonly interpreted as source rocks for hydrocarbons.
17. True or False: permeable sandstones are commonly found as reservoir rocks for hydrocarbons in the subsurface.
18. Examine slides 21 and 22, and related video discussion. Draw a sketch or image capture, with brief description, of the migration or fluid flow pathways that hydrocarbons take in the subsurface environment.
19. True or False: hydrocarbons in the subsurface environment want to flow upward due to density contrasts with water and high pore pressures due to the formation pressures at depth.
20. Examine slide 27, what is a “seal” (not the animal) in petroleum geology and why is it important for the preservation and entrapment of hydrocarbon accumulations in the reservoir rock. List two examples of seal-type rocks commonly found in oil fields.
21. True or False: this class is more fun than a barrel of barking seals.