

Introduction to Energy Resources
(자원공학개론) (38523-01)

- Midterm Examination -

Student ID:

Name:

Notice

- Fill your name in the following:

*“I, _____, swear I solve all problems by myself in this midterm examination.
I will take any disadvantages if any dishonesty such as cheating is acted on my solution.”*

5 points will be deducted from your total score if you do not fill in your name above.

Problem 1.

For the sub-problems from 1-1 to 1-4, give the full names of the following abbreviations:

- 1-1. SPE [2 pts.]
- 1-2. API [2 pts.]
- 1-3. STB [2 pts.]
- 1-4. OOIP (or OIIP) [2 pts.]
- 1-5. Describe the standard conditions in petroleum engineering [2 pts.]

Problem 2.

Explain the difference between upstream, midstream, and downstream in the petroleum industry, in brief [10 pts.].

Problem 3.

Explain how petroleum had been formed using a graph of the oil and gas window, in brief [10 pts.].

Problem 4.

Explain reserve estimation based on deterministic and probabilistic concepts, in brief [10 pts.].

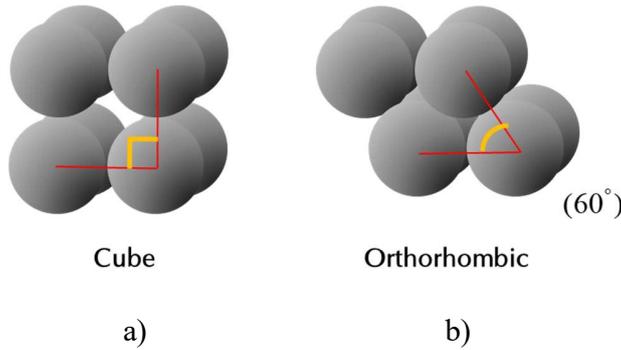
Problem 5.

Describe main factors affecting porosity, in brief [10 pts.].

Problem 6.

Calculate the porosity values for the following cases:

- a) Rock particles are regular cubic-packed spheres [5 pts.]
- b) Rock particles are regular orthorhombic-packed spheres [5 pts.]



Herein, $\pi \approx 3.14$, $\sqrt{2} \approx 1.41$, and $\sqrt{3} \approx 1.73$.

Problem 7.

Derive the following formula:

$$C_b = \phi C_f + (1 - \phi) C_m ,$$

where C_b is the bulk compressibility, ϕ is the porosity, C_f is the pore compressibility, and C_m is the matrix compressibility [10 pts.].

Problem 8.

Explain the entire or part of the field life cycle of a petroleum reservoir using more than or equal to 60 terms. You MUST number all the terms from ①, ②, ③, Note that 0.5 points per term is given to you. 30 points are the maximum points you can earn from this problem [30 pts.].

----- This is the End of the Midterm Examination -----