Carbon Energy
(탄소에너지) (38523)

- 2022 Midterm Examination -

Student ID: **Student 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.

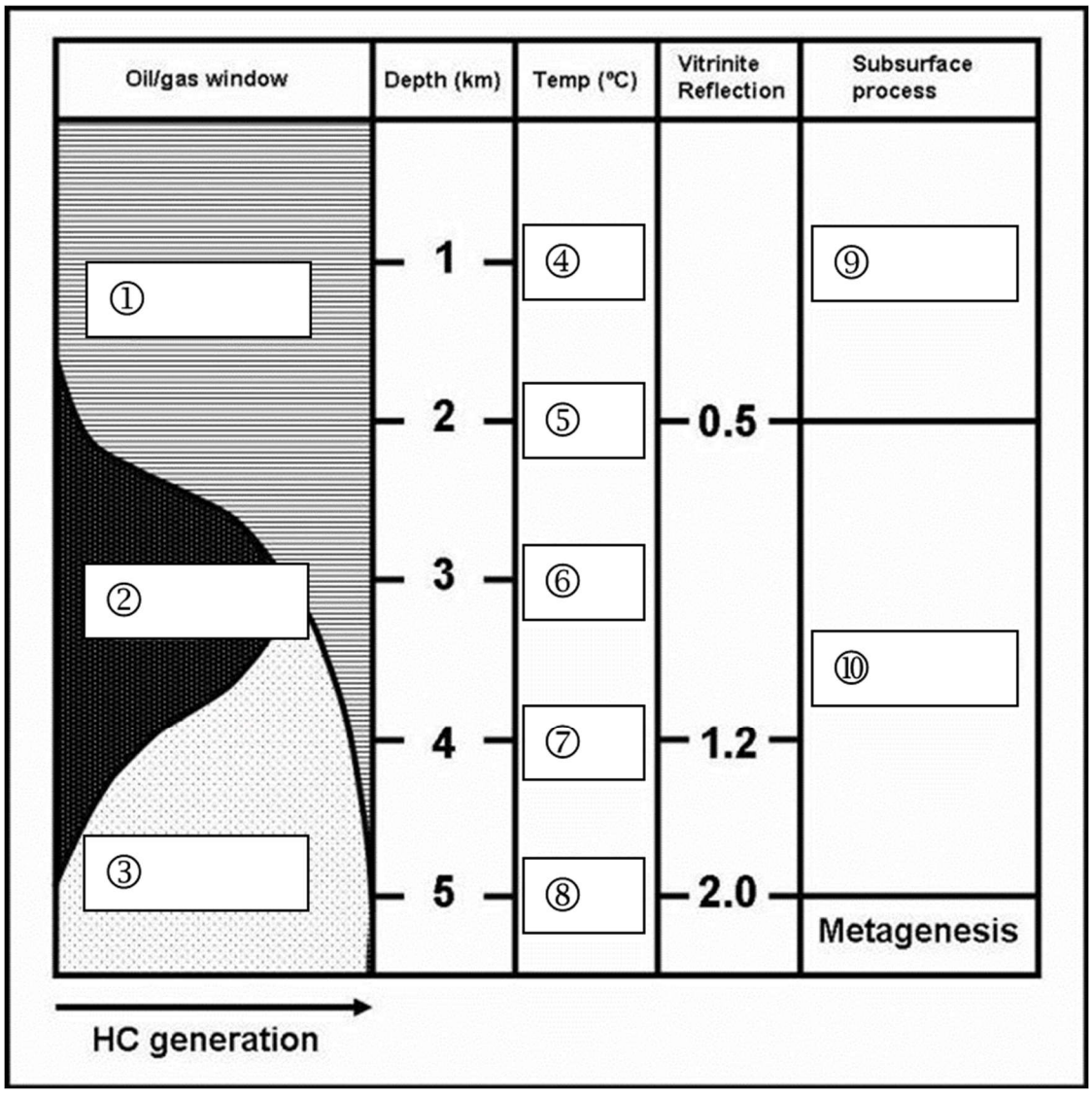
Problem 1.

For the sub-problems from 1-1 to 1-10, give the full names of the following abbreviations:

1-1. API [1 pt.]
1-2. EUR [1 pt.]
1-3. EOR [1 pt.]
1-4. SPE [1 pt.]
1-5. GOC [1 pt.]
1-6. OWC [1 pt.]
1-7. NPV [1 pt.]
1-8. IRR [1 pt.]
1-9. PBP [1 pt.]
1-10. ROI [1 pt.]

Problem 2.

Below is a schematic diagram of oil and gas window. Assume that the surface temperature is 0°C, surface pressure is 1 bar, geothermal gradient is 30°C/km, and geopressured gradient is 9.8 kPa/m. Fill in the blanks from ① to ⑩ [10 pts.].



Problem 3.

List up the seven essential components of a petroleum system. [14 pts.]

Problem 4.

4-1. Provide the definition of the term "petroleum." [5 pts.]

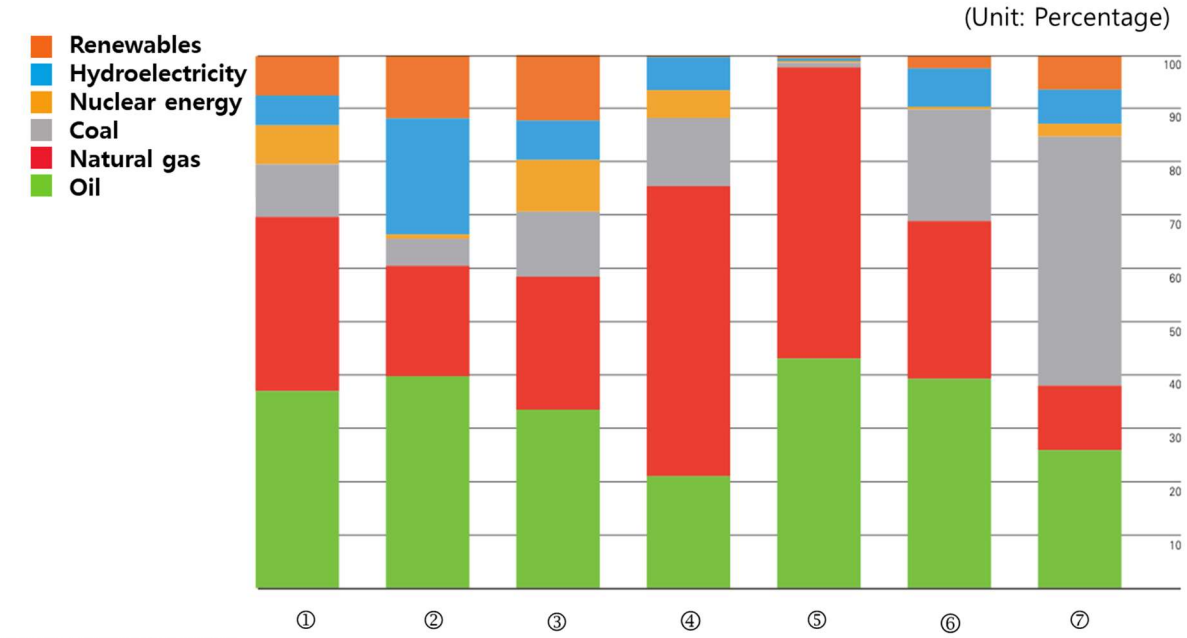
4-2. Provide the definition of the term "Reserve." [5 pts.]

4-3. Provide the definition of the R/P ratio [5 pts.]

Problem 5.

The energy mix refers to a group of different primary energy sources from which secondary energy for direct use (e.g., electricity) is produced. The figure below shows the regional energy consumption pattern in 2021, which is cited from *BP Statistical Review of World Energy 2022*. What are the names of regions from ① to ⑦ ? You can select the names from the below [14 pts.].

[Africa, Asia Pacific, CIS, Europe, Middle East, North America, and South & Central America]

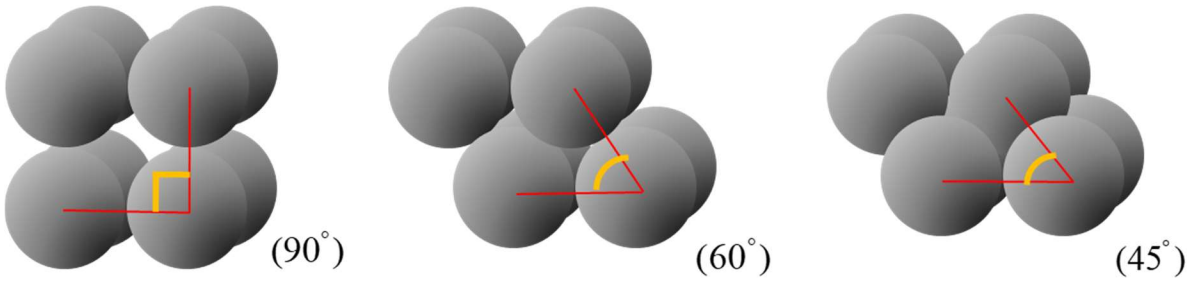


(Source : BP Statistical Review of World Energy 2022)

Problem 6.

6-1. Calculate porosity of a clean sandstone composed of orthorhombic grains to the first decimal place. [3.5 pts.]

6-2. Calculate porosity of a clean sandstone composed of rhombohedral grains to the first decimal place. [3.5 pts.]



Cube (a) Orthorhombic (b) Rhombohedral (c)

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

Problem 7.

Describe a drilling procedure with technical terms. You **MUST** give a number to each term. You will be given 1 point for each term, if appropriate. Therefore, 30 is the maximum point you can earn from this problem. [30 pts.].

Example) Each ① well is composed of ② casings and ③ tubing. …

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