

**The American University of Beirut
Department of Geology**

Geol 205: Earth resources and energy

**Fall 2005-2006: Final Examination
Dr. Maya El-Kibbi
Time: 2 hours**

Pledge
Exam rules apply.

I. Short answers (6 pts each)

1. - Name two ore minerals of titanium. Briefly explain why these minerals can be found in igneous, metamorphic, and sedimentary rocks.

2. Compare dry-steam and wet-steam geothermal fields.

3. How can recovery of heavy oils and tar sands be enhanced?

4. - List the 3 main processes affecting organic matter within specific intervals of burial depth.
- Which interval produces almost pure thermogenic methane?

5. Where can silicon be mined from? Give two modern uses of silicon.

6. Briefly explain 3 environmental problems related to mining and using coal.

7. Briefly explain why some organic matter produces natural gas and liquid petroleum while other organic matter forms natural gas and coal.

8. List two ferro-alloy metals and give the type(s) of rocks they are associated with.

9. Give two advantages and two disadvantages of using hydroelectric power.

10. Sketch and fully LABEL one stratigraphic and one structural hydrocarbon trap (gas + oil).

II. Fill in the blanks . Answers may involve more than one word. (2 pts each)

1. The process of recovering magnesium is _____. However, it requires _____.

2. Sapropelic coals are made of _____ that accumulated in _____.

3. Titanium is used in alloys because it is _____. It is also used in the preparation of white _____.

4. Base metals are usually associated with deposits produced by _____.
One base metal used in automotive batteries is _____.

5. The role of _____ is to keep constant power output in nuclear reactors.
We say that the fission chain reaction is maintained at _____.

III. Essay questions . Choose only 3 out of 4. (10 pts each)

1. Iron ore deposits may be formed by igneous, metamorphic, and sedimentary processes.
 - Explain how each one of these processes (including weathering) contributes to the formation of different types of deposits of iron.
 - Remember to provide the names of iron ore minerals and deposits.

2. - Explain how photovoltaic cells work.
 - Can photovoltaic systems be useful to produce hydrogen? How?
 - Production, transportation, and use of hydrogen for energy appears to involve some problems and risks. Explain.

3. - Explain the role of shallow groundwater in the formation of uranium-enriched rocks.
 - To separate out ^{235}U and ^{238}U , the process of gaseous diffusion is used. How does it work?
How expensive is it?

4. Explain how marine processes can form evaporites and phosphate deposits.

Good luck!