



American University of Beirut  
Final Examination



Economic Minerals Geology (306)  
Department of Geology  
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Jan. 28, 1997  
Time: 2 hours  
Exam rules apply

**PART I**

Answer the following two questions in part I.

(MARKS)

- (20) 1. a. Concisely define or describe the following terms:
- |  |                                     |
|--|-------------------------------------|
| i) Pathfinder element                  | ii) Connate water                   |
| iii) Skarn                             | iv) metallogenic province           |
| v) Protore                             | iv) Pseudosecondary fluid inclusion |
| iiiv) Noise and Signal (in geophysics) |                                     |
| iiiv) Gossan                           |                                     |
- b. Name the principle ore mineral for each of these ore deposits:
- Cu, Mn, Zn, Sn, Ni, and Ag ore deposits.
- c. Metamorphic fluids: Describe source and evolution, chemical nature and role in ore formation.
- (20) 2. a. List the various types of ore-bearing fluids.
- b. Explain why Cr-ores do not exist as hydrothermal deposits.
- c. List the various types of geochemical samples.
- d. The Zambian copper-belt is a world-class copper deposit of a chemical sedimentary origin: Describe this deposit, with emphasis on its metal source, zoning of minerals and sedimentary facies, and its origin and evolution.

**PART II**

Answer only two of the following three questions in part II.

- (15) 3. a. List the various genetic types of ore deposits.
- b. Describe the source and evolution (with examples) of ore deposits formed by



"Weathering". Describe the Nickel laterite deposit of New Caledonia.

- (15) 4. a. Silication and hydrolysis are important reactions to wall-rock alteration: Describe, and give examples (with chemical equations) for both reactions.
- b. With the aid of a diagram, illustrate the relative position of the common "alteration assemblages" in terms of temperature versus  $\log (a_{K^+} / a_{H^+})$ .
- (15) 5. Write an essay on the "Bushveld Complex of South Africa and its main ore deposits".