

**AMERICAN UNIVERSITY OF BEIRUT  
DEPARTMENT OF GEOLOGY**

**FINAL EXAMINATION**

**Diagenesis I: Advanced Petrography of  
Sedimentary Rocks (Geol 321)  
Dr. Fadi Nader  
Exam rules apply**

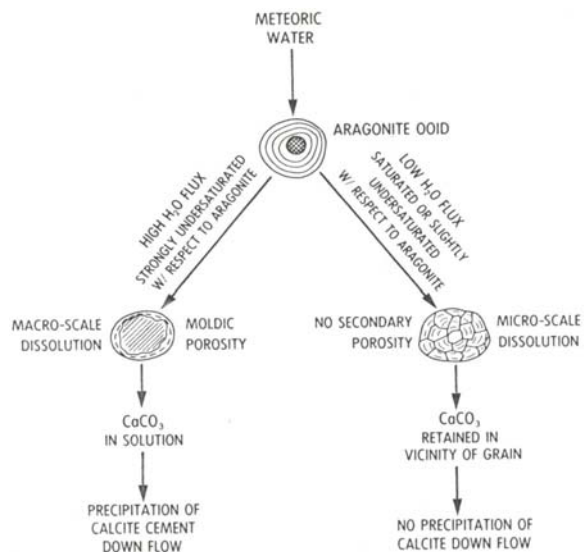
**January 30, 2006  
9:00  
Time: 3 hours**

**PART I**

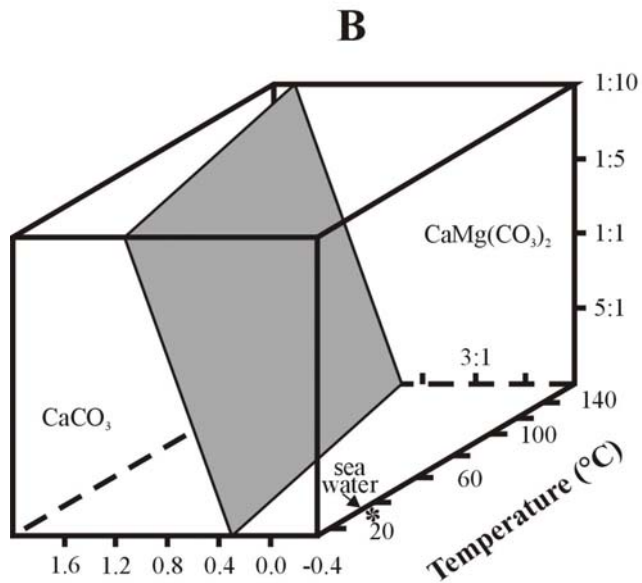
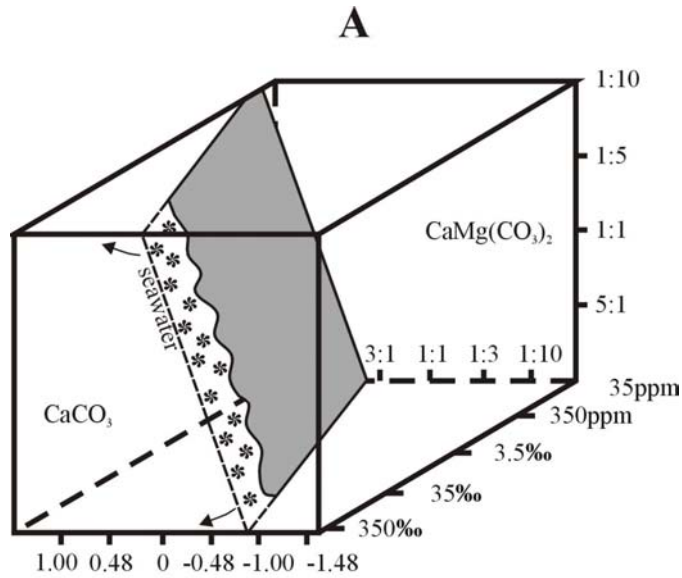
1. Use the microscope in front of you to examine the thin-section on its stage. Then, determine the corresponding porosity and cement (types and amounts; 10 points).
2. Study carefully the photomicrographs on Plate I (page 4) and answer the following questions (10 points):
  - a. Describe the dolomite matrix in Plate IA.
  - b. Identify and chronologically order the various diagenetic phases shown in both photomicrographs (A & B); i.e. set the thin section paragenesis.
    - Note: both photomicrographs are taken from the same thin section.
3. Study carefully the photomicrographs on Plate II (page 5) and answer the following questions (10 points):
  - a. Deduce the paragenetic sequence for both photomicrographs (A & B) separately.
  - b. Briefly discuss the corresponding evolution of diagenetic environments for each photomicrographs.
    - Note: the photomicrographs are taken from two different thin sections (A: dolostone; B: limestone).

**PART II**

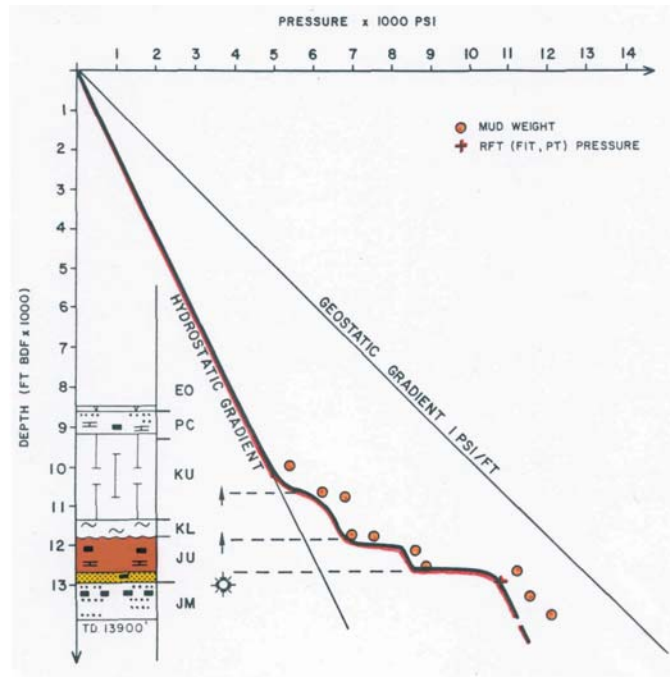
4. Give a proper title and discuss this figure briefly (less than 10 lines; 10 points).



5. Complete (label) the diagrams featured below and add the proper TITLES (for each diagram); then explain both diagrams properly (20 points).



6. Give a title to the following diagram and discuss it briefly (less than 10 lines; 10 points).



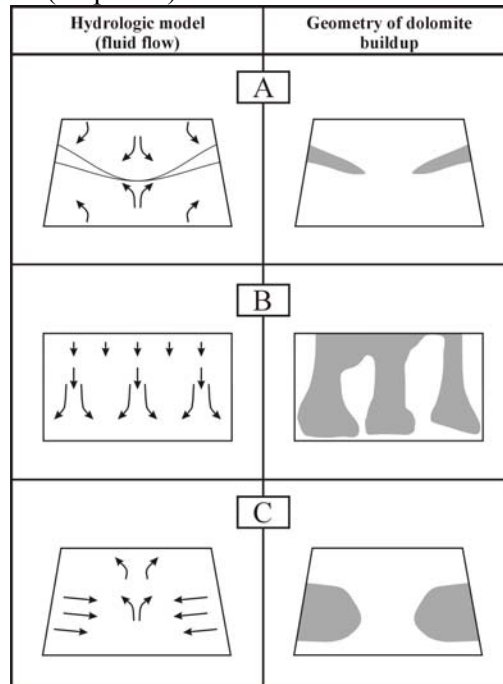
**PART III**

7. Answer **one** the following two questions (30 points):

- a. Name the three dolomitization models (A, B, & C) according to their hydrologic and geometrical characteristics.

AND

Discuss in details the dolomitization models corresponding to (A) and (B).

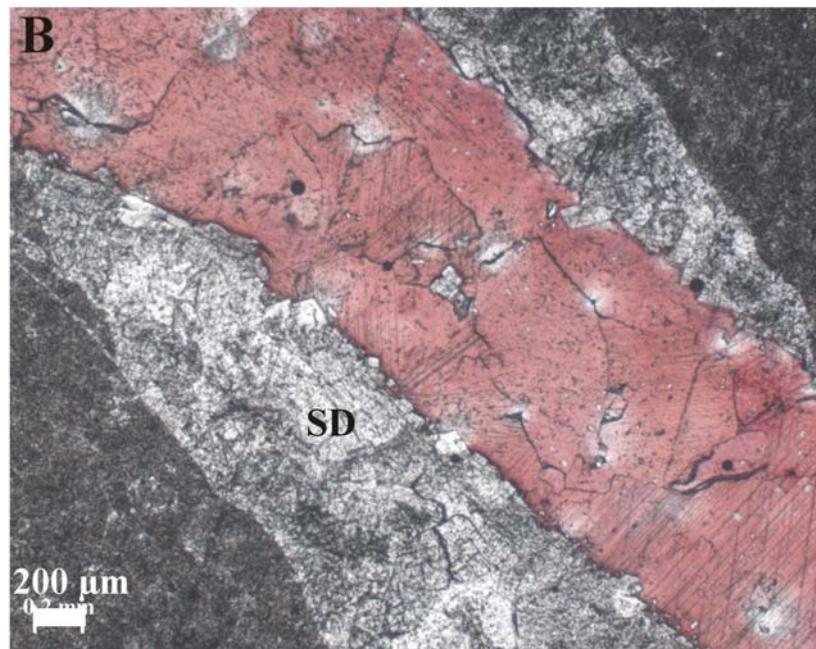
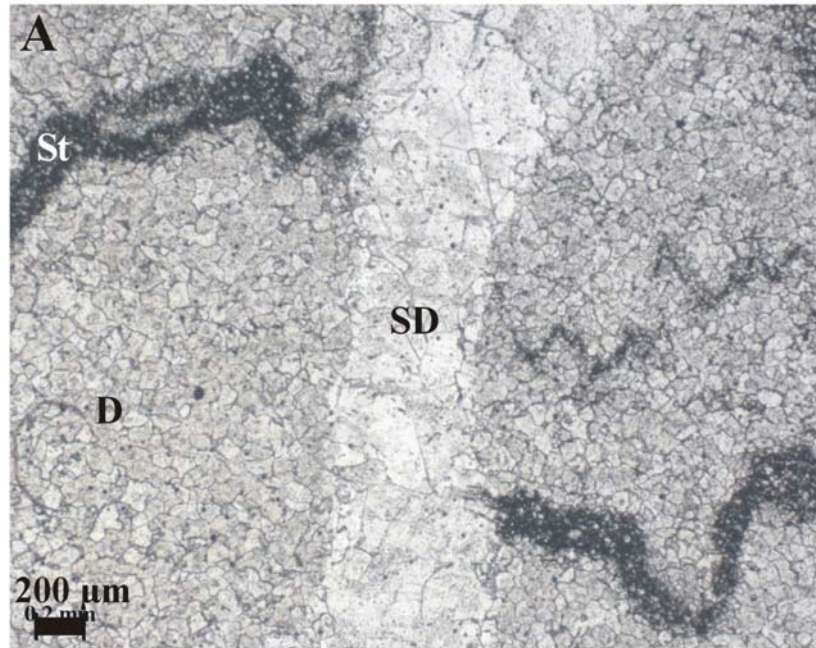


- b. Discuss the redistributive versus enhanced secondary porosity (give two examples of related fluids and processes – you may add sketches).

**GOOD LUCK**

## PLATE I: Conventional Microscopy

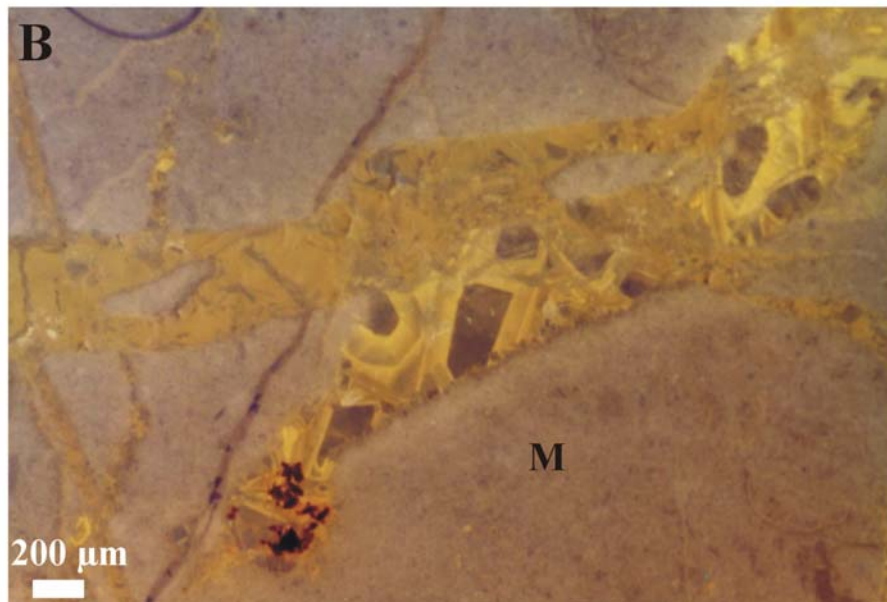
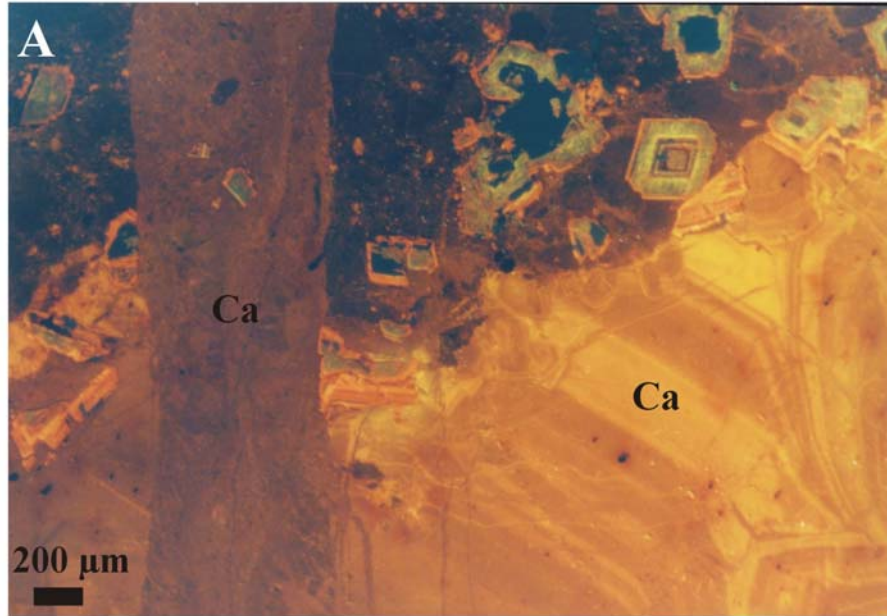
Transmitted-light photomicrographs of a stained thin section. 'D' is dolomite, 'SD' is saddle dolomite, and 'St' is stylolite.





## PLATE II: CL Microscopy

CL photomicrographs of a dolostone (A) and a limestone (B).  
'Ca' is calcite and 'M' is micrite (matrix).



DIAGRAMS FOR ESTIMATING PERCENTAGES OF MINERALS IN ROCKS  
( Terry & Chilingar , 1955 )

