

National University of Ireland, Galway
OLLSCOIL NA hÉIREANN, GAILLIMH

CHRISTMAS EXAMINATIONS 1ST SEMESTER 2000

3rd SCIENCE
SEDIMENTOLOGY & APPLIED GEOSCIENCE (GE321)

PAPER ONE

Prof. J.F. Dewey
Prof. Paul D Ryan
Prof. Michael Williams
Dr. Kate Moore

Time allowed: 3 hours

Answer: **Five** questions, **Two** from Section A and **All 3** questions from Section B.

Section A

1. Discuss the methods used in the grain size analysis of sediments. How are there results presented and what uses may be made of them?
2. Describe the principal processes and environments in the formation of evaporites.
3. Write a short essay on sedimentary geochemistry.
4. How does coal form? Describe the factors which may control the rank of a coal with examples.

Section B

5. **Geology**

Write illustrated notes using ONE of the following headings:

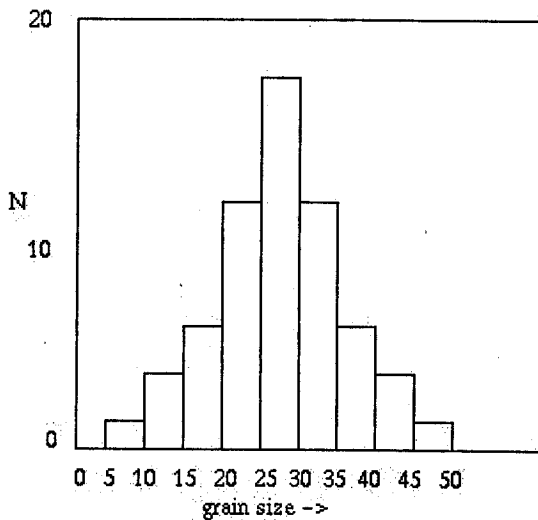
- Limestone, its properties, weathering, uses and hazards.
- The effect of varying physical conditions on deformation of geological materials.
- Photogeology and identification of potential hazards using remote sensing.

6. Statistics

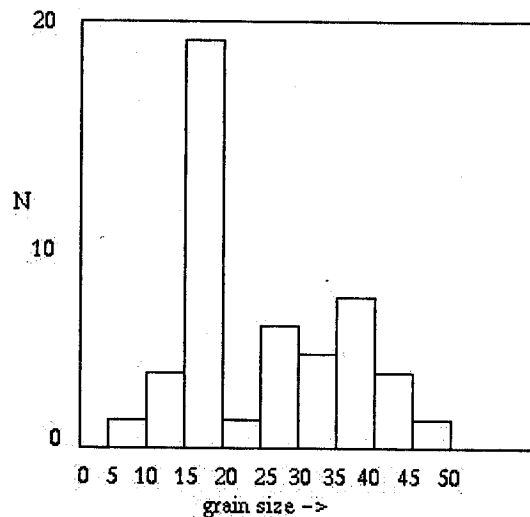
Spend ten minutes on each question. Answer all the questions.

- 1) Examine the two histograms A) and B) which are measures of clast sizes in a gravel, then answer the following questions:

(A)



(B)



Which of these distributions is approximately 'normal?'	A	B
for which of these samples would the mode be the best measure of central tendency?	A	B
for which of these samples would the quartiles be the best measure of dispersion?	A	B
for which of these samples would the standard deviation be the best measure of dispersion?	A	B

- 2) Describe when a 'one sample test' is used and briefly describe a statistical test that could be used to perform such a test.

- 3) What is the 'Null Hypothesis' and what is the 'Alternate Hypothesis'? How are they used and what is the normal significance level which we use to distinguish between them?

7. Geophysics

Write short notes on the following topics.

One page should be more than sufficient for each.

- Ground penetrating radar (GPR)
- Physical properties of near-surface rocks controlling speeds of P- and S-waves.
- Dipole-dipole electrical pseudo-sections
- Seismic refraction travel-time wave over a dipping layer
- Electrical resistivities of common rock types.