UNIVERSITY OF FORT HARE

GLG221
Structural Geology, Geochemistry and Economic Geology

BSc Main Examination: November 2024

Subject: Geology

Time: 3 Hours **Marks: 100**

This paper consists of 3 pages including the cover page

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INSTRUCTIONS

Answer all questions in sections A, B and C. Answer one in section D.

SECTION A: GEOLOGY OF ORE DEPOSITS

Question One [25]

With the aid of diagrams/drawings, explain the following terminologies of ore-deposits:-

A. Geode [2]

B. Payshoots [2]

C. Stockwork [2]

D. Lode [2]

E. Stratiform ore deposit [2]

F. Stratabound ore deposit [2]

G. Veinlet [2]

H. Vug [3]

I. Tabular ore-body [2]

J. Podiform [2]

K. Pipes [2]

L. Irregular [2]

SECTION B: GEOCHEMISTRY

Question Two [25]

Define the following terms:

2.1.1 Geochemistry. [2]
2.1.2 Geochemical Affinity. [2]
2.1.3 Coordination Number (CN). [2]
2.1.4 Trace Elements. [2]
2.1.5 Major Elements. [2]

2.2 According to Goldschmidt's classification of elements, differentiate between lithophiles, siderophiles, chalcophiles, and atmophiles. List 3 elements for each classification. [8]
According to Goldschmidt's Rules, list and describe the three (3) factors that control atomic substitution. [7]

SECTION C: STRUCTURAL GEOLOGY

Question Three [25]

3.1 Discuss four main stages that can be recognized in the tectonic development of a typical rifted passive margin. [8]
3.2 Define the following terms:
a) Nappe [2]
b) Leading edge [2]
c) Detachment plane [2]
3.3 Define what melanges are and list five types and their related tectonic environment. [7]
3.4 Distinguish between active and inactive rifts. [4]

SECTION D: SOUTH AFRICAN GEOLOGY

Question Four [25]

4.1 Give an account of the Barberton Greenstone Belt. Your account should include an introduction, structure, mineralization, and formation.

Question Five [25]

5.1 Briefly discuss the geology and the mineralization of the Cape Fold belt. [10]
5.2 Briefly discuss the cratonization of the Kaapvaal craton. [10]
5.3 Briefly discuss the formation and structure of the Vrede Dome [5]