FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
SCHOOL OF PHYSICAL SCIENCES
DEPARTMENT OF GEOLOGY
FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BTech GEOLOGY 2015/2016 SESSION

COURSE: GEL 411 (ECONOMIC GEOLOGY) UNITS: 3 DATE: 6th April, 2016 DURATION: 2hrs 30 min

INSTRUCTIONS: Answer any TWO questions from each of Sections A and B.

SECTION A

Q1(a) Distinguish between Prospection and Exploration for mineral deposits.
(b) Outline and discuss the various steps you will follow to carry out gold prospection/development.

Q2 (a) Discuss the criteria used for classification of mineral deposits according to Lingren (1991) and Bateman (1942).
b) Explain the genesis and economic implication of the mushroom shape anomaly in soil geochemical survey programme.

Q3 a) Explain the geostatistical and any two geometrical methods of ore reserve estimation.
b) Describe the lithostratigraphy of the Nupe Basin and its mineral resources.

SECTION B

Q4(a) Define the term **"Concentration Factor"**within the context of Economic Geology.
(b) Assume that the typical exploitable grades of Iron (Fe) and Platinum (Pt) are 50% and5.5 grams/ton (g/t) and that their average crustal abundances is 56000ppm and 5ppb respectively, determine the concentration factors of Fe and Pt in order to form potentially viable deposits.
(c) Explain how **igneous and sedimentary process processes** lead to formation of metallic mineral deposits.

Q5(a) Mitchell and Garson (1976) proposed that there is a relationship between tectonic environments/processes and mineral deposits. Summarize their propositions within the framework of the three major tectonic regimes.
(b) State three points advanced by the critics to challenge the conventional perspective in (a) above.
(c) State clearly your position on prospecting for mineral deposits using plate tectonics.

Q6(a) Explain the term "Industrial Minerals"

(b) state the environments and conditions of formation of the following mineral deposits: coal, limestone, evaporites.

(c) By pointing out relevant specifications, state at least three areas of applications of any three of the following industrial minerals: Barites, Phosphates, Clay, Talc and Silica.