**NATIONAL OPEN UNIVERSITY OF NIGERIA**
**University Village, NnamdiAzikiwe Expressway, Plot 91, Cadastral Zone, Jabi, Abuja**
**FACULTY OF SCIENCES**

**Department of Pure and Applied Science**

**JANUARY 2018 EXAMINATION QUESTIONS**

**COURSE CODE:** PHY461

**COURSE TITLE:** GEOPHYSICS III

**COURSE UNIT: 3 units**

ANSWER QUESTIONS ONE AND ANY FOUR OTHER QUESTIONS

Q1(a) i. Discuss the basic principles of electrical resistivity and induced polarizationmethods.

ii. Name the essential accessories in DC survey instrument

iii. When would you describe conductors as being well coupled?

iv.Name and describe the various array systems( 10 MARKS)

(b) i. State the various areas of application of this method

ii. Discuss the concept of electrical depth sounding survey.

iii. Discuss the two limiting situations in Electromagnetic Methods

iv. Explain Turam.

v. Describe the concept of TEM depth sounding ( 6 MARKS)

(c) i. Discuss the term 'VLF Radiation'

ii. Demonstrate how EM-16 add-on module is used to measure horizontal electric field.

iii. Explain the source and principle of Controlled Sources, Auto-Magneto Telluric Method

vi. List the various applicable areas of electrical and electromagnetic methods.

( 6 MARKS)

Q2(a) Discuss briefly Continuos wave (CW) and Transient Electromagnetic Methods.(4 marks)

(b) Explain problems associated with metal electrodes and their solutions. .(4 marks)
(c) Explain *Apparent Resistivity*. .(4 marks)

Q3 (a) Briefly explain Presentation and Interpretation of Sounding Data. .(4 marks)
(b) Discuss depth of penetration of resistivity equipment. .(4 marks)
(c) Explain the Ideal target in resistivity traversing. .(4 marks)

Q4 (a) Briefly explain fixed source systems in EM-method. .(4 marks)
(b)Explain TEM systems. .(4 marks)
(c) Distinguish between *TEM and IP* .(4 marks)

Q5 (a) Explain the basis of Auto Magneto Telluric Method and its application.(3 marks)
(b) Discuss briefly VLF transmissions and detections (4 marks)
(c) i. A significant problem associated with many of the EM survey methods is that a small secondary field must be measured in the presence of a much larger primary field. How would you overcome this problem?
ii.Explain filtering, types of filters you know and the purpose why noise has to be filtered?
.(5 marks)

Q6 (a) Explain the principle of CSAMT at far field distances. .(3 marks)
(b) Discuss the application of Electrical and Electromagnetic Methods in Mineral Exploration.
.(3 marks)

(c)Discuss application of Electrical and Electromagnetic Methods in engineering geology**.**
.(6 marks)