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**NATIONAL OPEN UNIVERSITY OF NIGERIA**

**PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI - ABUJA**

**FACULTY OF SCIENCES**

**DEPARTMENT OF PURE AND APPLIED SCIENCE**

**2018\_2 SEMESTER EXAMINATION**

**COURSE CODE: PHY 461**

**COURSE TITLE: GEOPHYSICS III**

**CREDIT UNIT 3**

**TIME ALLOWED (2½ HRS)**

**INSTRUCTION: *Answer question 1 and any other four questions***

**QUESTION 1**

a. Discuss the term Very Low Frequency Radiation. (**4 Marks)**

b. Explain four essential accessories in direct current survey instrument. (**6 Marks)**

c. Describe the concept of Transient electromagnetic depth sounding. (**6 Marks)**

d. Explain depth penetration in varying current method. (**2 Marks)**

e. State Ohm’s law. (**2 Marks)**

f. State Biot-Savart law. (**2 Marks)**

**QUESTION 2**

a. State Archie’s law. (**3 Marks)**

b. Explain the apparent resistivity. (**4 Marks)**

c. Write five resistivity of common rock and their respective ore. (**5 Marks)**

**QUESTION 3**

a. Describe three array systems applied in seismic survey. (**6 Marks)**

b. Discuss the concept of Electrical Depth Sounding survey (**3 Marks)**

c. Discuss the effects of coil separation. (**3 Marks)**

**QUESTION 4**

a. Explain these terms in electrical and electromagnetic methods in mineral exploration.

(i) Massive ore (**4 Marks)**

(ii) Disseminated sulphide ore. (**4 Marks)**

b. Explain how a nomenclature can pose a problem in electrical work (**4 Marks)**

**QUESTION 5**

a.Discuss the following terms: (i) Very low frequency transmission (**3 Marks)**

(ii) Detecting Very low frequency field. (**3 Marks)**

b. Explain the magnetic field effects and electric field effects in the very low frequency field.

(**6 Marks)**

**QUESTION 6**

a.Explain the EM-16 VLF instrument. (**6 Marks)**

b. What Factor control the detection depth of the VLF method.  **(3 Marks)**

c. Explain the EM-16 VLF instrument. (**3 Marks)**