



CRAWFORD UNIVERSITY, IGBESA,
FAITH CITY, IGBESA, OGUN STATE
COLLEGE OF NATURAL AND APPLIED SCIENCES
DEPARTMENT OF PHYSICAL & EARTH SCIENCES
GEOLOGY & MINERAL SCIENCES
Harmattan Semester Examinations (B.Sc. Degree), 2016/2017
COURSE: GEM 461 – Applied Geophysics

UNIT: 3 Units

TIME ALLOWED: 2hrs

INSTRUCTIONS: Attempt Any Four Questions

- 1a. Outline the various type of Electrical surveying techniques in mineral exploration (5 marks)
- 1b. With annotated diagram, discuss the parameters used in defining resistivity (5 marks)
- 1c. Explain the main types of procedure commonly employed in resistivity surveys (5 marks)
- 1d. With suitable diagrams, show the difference between Wenner and Schlumberger arrays (5 marks)
- 2a. Itemise the factors that will both "Decrease and Increase" the resistivity of a rock (10 marks)
- 2b. With annotated diagram, write succinctly how current flow in the ground during resistivity surveying (10 marks)
- 3a. Interpretation of vertical electrical sounding suffers from non-uniqueness arising from problems known as equivalence and suppression. Discuss (10 marks).
- 3b. Outline the limitations of resistivity method (10 marks)
- 4a. With suitable diagrams, show the various curve types produced with variation of apparent resistivity with electrode separation over three horizontal layers (10 marks)
- 4b. Construct graphically the following four-layer field curve having the listed values below:
- $\rho_1 = 100\Omega m, \rho_2 = 400\Omega m, \rho_3 = 20\Omega m, \rho_4 = \infty$
- $h_1 = 3m, h_2 = 12m, h_3 = 60m, h_4 = \infty$ (10 marks)
- 5a. Using simple diagram, discuss the general principle of electromagnetic surveying (10 marks)
- 5b. Discuss the depth of penetration of electromagnetic fields (10 marks)