



ELIZADE UNIVERSITY
FACULTY OF BASIC AND APPLIED SCIENCES

DEPARTMENT: PHYSICAL AND CHEMICAL SCIENCES

PROGRAMME: APPLIED GEOPHYSICS EXAM TITLE: DEGREE EXAMINATION

COURSE CODE & TITLE: AGP 417 – Engineering Geophysics

TIME ALLOWED: 2 hrs SEMESTER/SESSION: FIRST / 2018/2019

INSTRUCTIONS: Write your matriculation number on the cover page of the exam booklet.

Answer QUESTIONS 2 AND 3, and any OTHER ONE question.

HOD's SIGNATURE

1. (a) Outline **three (3)** applications of the electrical resistivity and **two (2)** applications of the seismic refraction prospecting methods in engineering site investigation.
(b) State **two** advantages and **one** limitation of the seismic refraction method in engineering survey.
(c) Discuss **four (4)** factors that influence the resistivity of earth material.
(16 marks)
2. (a) The Table below shows a seismic refraction data along a proposed Airport runway. Interpret the data and generate the geologic model along the proposed runway. What are your observation(s)? Give appropriate advice.
(b) State **three (3)** basic requirements of a building foundation.

Offset (m)	Travel Time (ms)	Offset (m)	Travel time (ms)
0	0.0	190	21.7
30	5.0	210	23.2
50	9.0	230	24.6
70	13.2	260	32.2
90	16.2	280	33.9
110	17.2	300	35.2
130	18.0	320	36.5
150	19.6	340	37.7
170	20.7	360	39.2

(22 marks)

3. (a) Study Figure 1 and answer the following questions;
 - (i) How many geologic/geoelectric layers are delineated by the section and give the geoelectric characteristics of each layer.
 - (ii) Which of the layers is appropriate for electrical system earthing? Give reason for your answer.
 - (iii) Do you consider any buried metal pipe within the second layer susceptible to any threat? State such threat if any and give reason for your answer.
 - (iv) What advice would you give to Building Engineers, suppose Figure 1 was delineated at a proposed site for a three-floor building?

(b) Differentiate between settlement and differential settlement in buildings. State **three (3)** factors that could be responsible for settlement of buildings.

(22 marks)

4. (a) Discuss **four (4)** advantages of geophysical prospecting in engineering site investigation.
(b) Compare the Direct method and Indirect method of subsurface imaging in engineering investigation.
(c) Highlight **four (4)** considerations in the selection of geophysical method(s) in engineering site investigation.

(16 marks)

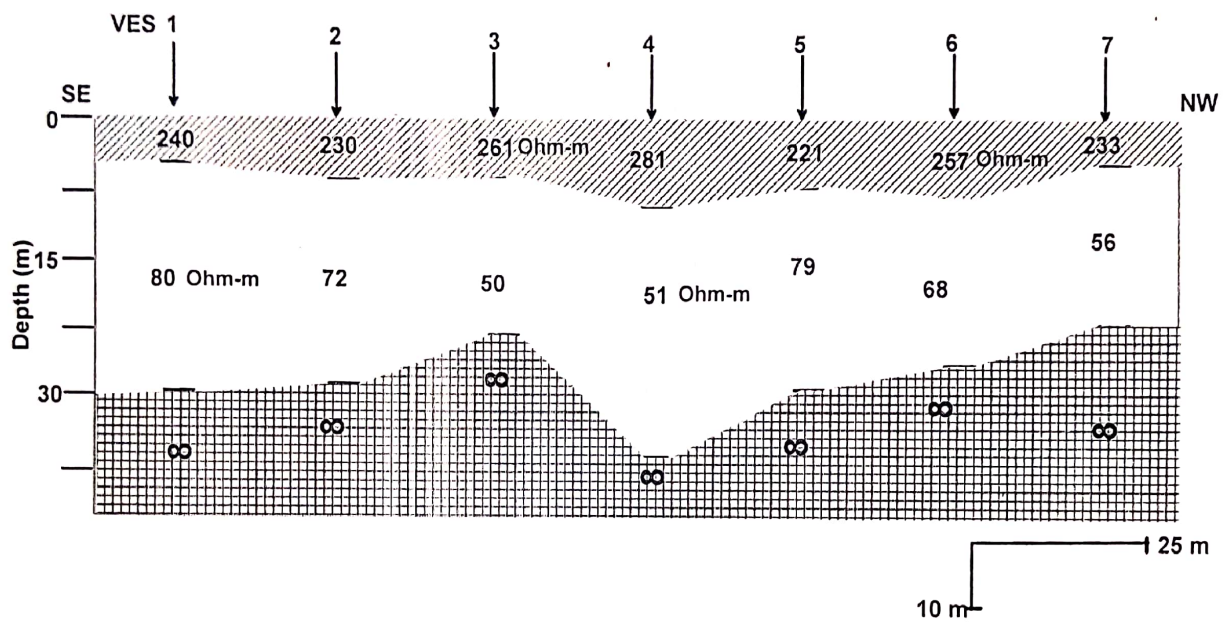


Figure 1: Geoelectric Section Along SE-NW Direction of a Construction Site