



UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE IN
GEOPHYSICS

GPHY 427: GEOPHYSICS PRACTICAL VII

STREAMS: BSC (PHYS)

TIME: 2 HOURS

DAY/DATE: TUESDAY 24/12/2024

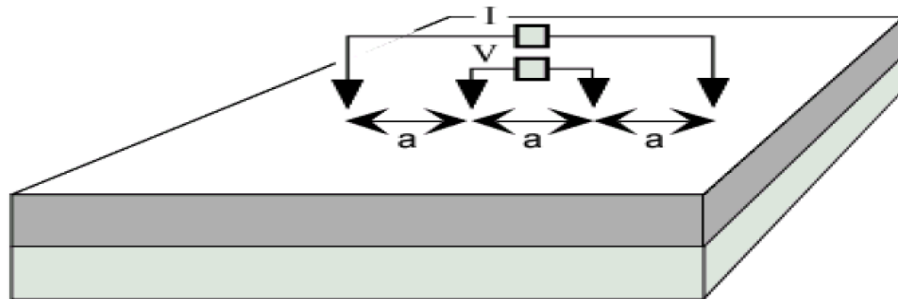
2.30 P.M. – 4.30 P.M.

INSTRUCTIONS: ANSWER QUESTION ALL QUESTIONS, EACH (20 MARKS)

QUESTION ONE (20 MARKS)

- a) List common errors encountered during a resistivity survey with the ABEM Terrameter and their possible solutions [5 marks]
- b) Identify the method in use in the diagram below and show that the apparent resistivity is given by the equation [12 marks]

$$\rho = 2\pi a \Delta V / I$$



- c) State the merits and demerits of the above method [3 marks]

QUESTION TWO (20 MARKS)

- a) How can you identify the presence of groundwater using resistivity survey results from the ABEM Terrameter? [4 marks]
- b) How can you ensure the quality of resistivity data collected using the ABEM Terrameter? Mention at least three ways [6 marks]

GPHY 427

- c) If given four electrodes spaced at equal distances of 5 meters in a Wenner array, calculate the apparent resistivity for a measured resistance of 35Ω [5 marks]
- d) What safety precautions should be taken during resistivity surveys, especially in areas with rocky terrain or near power lines? [5 marks]

QUESTION THREE (20 MARKS)

- a) Conduct a 2D resistivity survey using the ABEM Terrameter. Explain how to set up the system for a multi-electrode survey and acquire data [10 marks]
- b) Design a resistivity survey using the ABEM Terrameter to locate a buried water pipeline. Outline the procedure, expected results, and challenges [15 marks]
