



**ELIZADE UNIVERSITY  
ILARA-MOKIN  
ONDO STATE**

**FACULTY: Basic and Applied Sciences  
DEPARTMENT: Physical and Chemical Sciences  
FIRST SEMESTER EXAMINATIONS**

**2016/2017 ACADEMIC SESSION**

**COURSE CODE: AGP 423**

**COURSE TITLE: ENVIRONMENTAL GEOPHYSICS**

**DURATION: 2 ½ Hours**

A rectangular box containing a handwritten signature in black ink.

**HOD's SIGNATURE**

**TOTAL MARKS: 70 MARKS**

**Matriculation Number: \_\_\_\_\_**

**INSTRUCTIONS:**

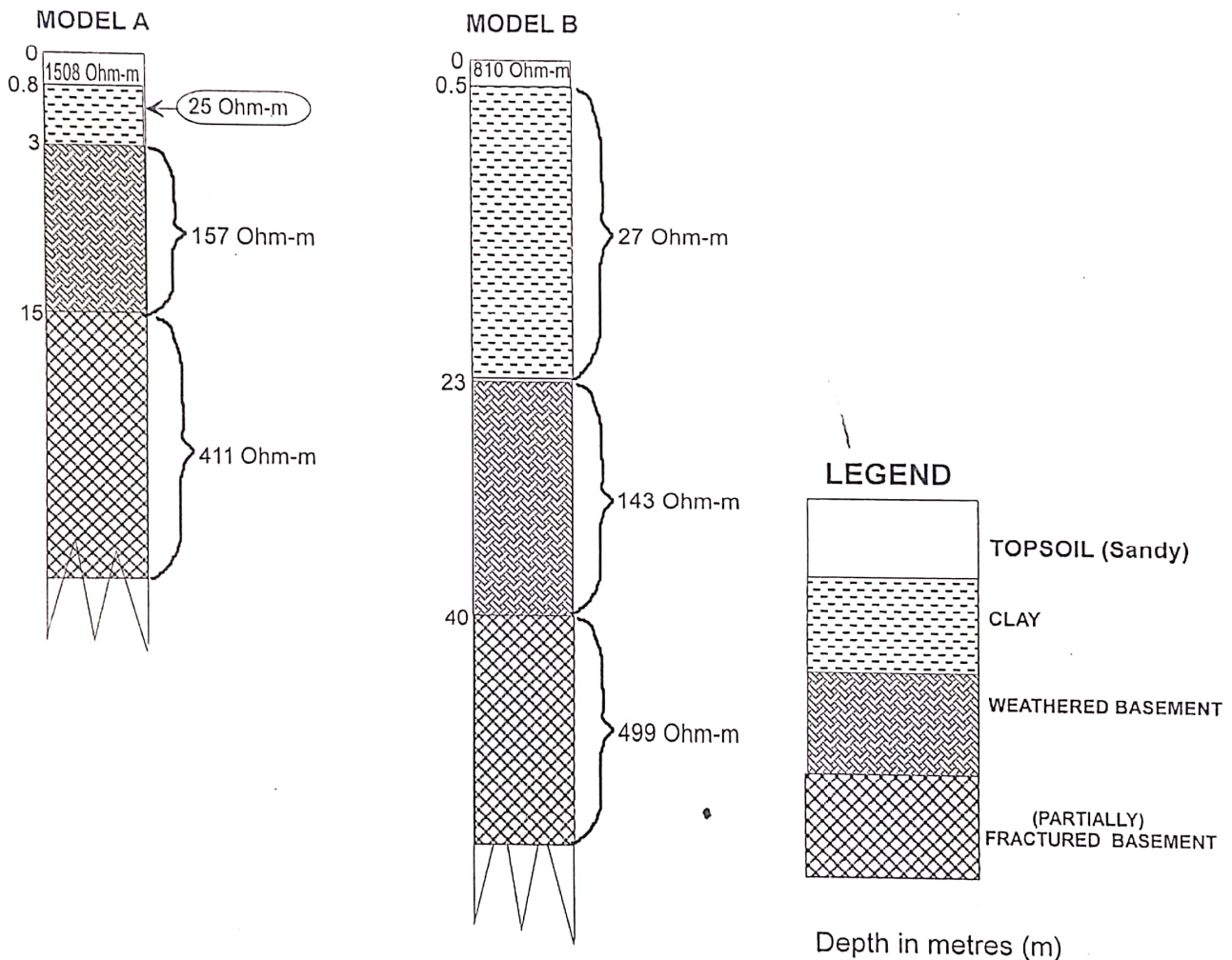
1. Write your matriculation number in the space provided above and also on the cover page of the exam booklet.
2. This question paper consists of 3 pages, including the cover page.
3. Answer all questions in the exam booklet provided.
4. Attempt Questions 2 and 5, and any other two questions.

**ELIZADE UNIVERSITY**  
**FACULTY OF BASIC AND APPLIED SCIENCES**  
**DEPARTMENT: PHYSICAL AND CHEMICAL SCIENCES**  
**PROGRAMME: APPLIED GEOPHYSICS EXAM TITLE: DEGREE EXAMINATION**  
**COURSE CODE & TITLE: AGP 423 – ENVIRONMENTAL GEOPHYSICS**  
**TIME ALLOWED: 2 ½ hrs SEMESTER/SESSION: FIRST / 2016/2017**  
**INSTRUCTIONS: Answer questions 2 and 5, and any other TWO questions.**

*Write your matriculation number only on your answer script(s) and NOT your name*

1. (a) Define environmental geophysics.
- (b) Environmental and engineering geophysics are areas of specialization in geophysics. Highlight the principal distinctions between both specializations.
- (c) State **five** useful geophysical methods that can be employed for environmental work. (14 marks)

2. (a) Carefully study the geoelectric models from a typical Basement Complex environment shown below. Identify which of these models has low vulnerability to groundwater pollution from possible surface contaminants from anthropogenic activities. Give reasons for your choice.



- (b) For each of the models, identify the aquifer layers and state their geoelectric parameters in terms of thickness and resistivity values.

- (c) For both models, calculate the total longitudinal conductance (S), and total traverse resistance (T) of the layers above the aquifer layers. (22 marks)
3. (a) Explain air stripping and air sparging as forms of groundwater remediation techniques.
- (b) Briefly explain **four** major reasons the electromagnetic method (EM) could be considered a useful investigation tool in an extensively polluted/contaminated environment. (14 marks)
- (c) Explain the term "salt water intrusion".
4. (a) Briefly discuss the impacts of human activities upon the environment.
- (b) Give an appraisal of the working principle of Ground Penetrating Radar (GPR).
- (c) Enumerate **four** limitations of GPR in environmental surveys. (14 marks)
5. (a) What is your understanding of soil corrosivity?
- (b) Which geophysical method would you adopt to determine the degree of soil corrosivity as pre-investigation for installation of industrial metal pipes? How do you interpret your measurements?
- (c) Consider that the soil types in the table below are from fresh water saturated environment, rate their degree of corrosivity by completing the table below, using the terms: High, Moderate, Low, Very low.

Soil Type	Degree of Corrosivity
Sandy Clay	
Clayey Sand	
Clay	
Sand	

(20 marks)