



ELIZADE UNIVERSITY
ILARA-MOKIN
ONDO STATE

FACULTY: Basic and Applied Sciences
DEPARTMENT: Physical and Chemical Sciences
FIRST SEMESTER EXAMINATIONS
2018/2019 ACADEMIC SESSION

COURSE CODE: AGP 311

COURSE TITLE: MAGNETIC AND GRAVITY PROSPECTING METHODS

DURATION: 2 Hours 30 Minutes

HOD's SIGNATURE

TOTAL MARKS: 60 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 2 pages including this page.
3. **Attempt Question 1 and 4 and any other two questions.**

1. The following data were obtained during a gravity survey on a mineral prospecting

Station	B.S	0	1	2	3	4	5	6	B.S
Altitude (m)	225	232	231	230	230	232	231	236	225
Time	0:54	0:57	1:03	1:10	1:16	1:22	1:33	1:41	2:06
Instrument Reading	1256.0	1251.9	1251.7	1252.3	1252.5	1253.7	1254.0	1242.0	1255.3

Gravimeter instrumental constant = 0.0948mGal

Density = 2.76g/cm³

Latitude of the study area = 7° 38'

Station separation = 20m

(a) Plot the Bouguer anomaly against distance.

(b) Identify from 1a possible mineralization zone(s).

15 Marks

2(a) Discuss with the aid of a schematic diagram the working principle of a Worden Gravimeter.

(b) Assuming the value of g at a location on the surface of Earth is 9.875m/s², calculate the approximate mass of the Earth supposing the radius of the Earth is 6,371

15 Marks

3 (a) Discuss three major forms of data corrections needed to be carried out on a raw gravity data

(b) Explain the following terms:

- i. Newtonian law of gravitation ii. Centrifugal force. iii. Geoid

15 Marks

4 Discuss the field procedure, the data analysis and interpretation technique you will employ in ground magnetic survey of a magnetite iron deposit.

15 Marks

5 (a) Imagine two masses of rocks A and B with 0.02 and 0.5 magnetic susceptibility value respectively induced by an external field, H, with magnitude 2010 nT. Calculate the intensity of Magnetization for (i) H perpendicular to the rocks surface.

(ii) H at 30° to the rock surface (iii) Calculate the H' and total magnetic flux inside each rock.

(b) Describe with the aid of a diagram the elements of earth's magnetic field.

15 Marks

6 (a) Define the following terms;

- (i) Magnetic moment (ii) Magnetic susceptibility (iii) Magnetic induction

(b) Explain the concept of remanent magnetism using hysteresis loop

15 Marks