

BOWEN UNIVERSITY, IWO. OSUN STATE. NIGERIA
COLLEGE OF AGRICULTURE, ENGINEERING, AND SCIENCE
PHYSICS PROGRAMME

FIRST SEMESTER EXAMINATION 2022/2023 SESSION

PHY 209: INTRODUCTION TO THE PHYSICS OF SOLID EARTH (2 CREDITS)

DATE: WEDNESDAY, 15TH FEBRUARY, 2023

TIME: 4.00PM – 6.00PM

INSTRUCTION: ANSWER ONLY THREE QUESTIONS

QUESTION 1

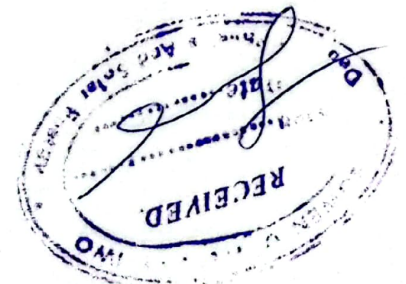
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|--|------------|
| (a) Define is Magnetic Susceptibility (k)? | 2 1/2 Mrks |
| (b) With a well labelled diagram, show the Earth's magnetic fields | 7 Mrks |
| (c) Discuss the following: | |
| (i) Diamagnetism | 3 Mrks |
| (ii) Paramagnetism | 3 Mrks |
| (iii) Ferromagnetism | 3 Mrks |
| (d) Derive the expression for Magnetic Scalar Potential | 7 Mrks |
| (e) Deduce the application of (d) to field equation outside the Volume | 4 1/2 Mrks |
| (f) Deduce the application of (d) to field equation within the Volume | 3 1/2 Mrks |

QUESTION 2

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| (a) Draw a well labeled diagram of the Earth's interior | 5 1/2 Mrks |
| (b) Define the following terms: | |
| (i) The Crust | 2 Mrks |
| (ii) The Mantle | 2 Mrks |
| (iii) The Core | 2 Mrks |
| (c) Write a short note on: | |
| (i) Asteroids | 4 Mrks |
| (ii) Comets | 4 Mrks |
| (iii) Meteorites | 4 Mrks |
| (d) Differentiate between the following terms: | |
| (i) Perihelion and Aphelion | 2 Mrks |
| (ii) Perigee and Apogee | 2 Mrks |
| (e) Give three (3) characteristics of the Solar System | 3 Mrks |
| (f) Highlight three (3) differences between Outer and Inner Planet | 3 Mrks |

QUESTION 3

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|--|------------|
| (a) What do you understand by Seismology? | 3 1/2 Mrks |
| (b) Define the following terms as related to Seismology: | |
| (i) Seismic Discontinuity | 2 Mrks |
| (ii) Seismic Continuity | 2 Mrks |
| (iii) Transition Zone | 2 Mrks |
| (c) Using the Elastic Theory explain the formation of an Earthquake | 7 Mrks |
| (d) Discuss the Elastic Rebound Model | 10 Mrks |
| (e) Discuss Velocity Zone and The 'D' layer, hence state the correlations between them | 5 Mrks |
| (f) Highlight two Earthquake controls that you know | 2 Mrks |



QUESTION 4

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|---|------------|
| (a) What is Remanent Magnetization? | 3 1/2 Mrks |
| (b) Explain the process of the following type Remanent Magnetization (RM) | |
| (i) Natural RM | 3 Mrks |
| (ii) Isothermal RM | 3 Mrks |
| (iii) Chemical RM | 3 Mrks |
| (c) Draw a well-labelled diagram of the Rock Cycle | 8 Mrks |
| (d) Highlight the most important factor influencing Rock Magnetization | 3 Mrks |
| (e) List four common minerals in the crust | 4 Mrks |
| (f) Define the following as related to Earthquake | |
| (i) Epicenter | 2 Mrks |
| (ii) Intensity of an Earthquake | 2 Mrks |
| (iii) Magnitude of Earthquake | 2 Mrks |

