



KENYATTA UNIVERSITY

EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN

PETROLEUM ENGINEERING

EPL 305: GEOLOGICAL SURVEY

1st SEMESTER 2023/2024

TIME: 2 HOURS

INSTRUCTIONS:

This examination consists of two sections (A and B). Answer **Section A (Compulsory)** and **ANY OTHER TWO QUESTIONS** from section B

Section A (Compulsory – 30 marks)

Question One

- a) Define the following terms as used in geological survey. [10 marks]
- i. Remote sensing
 - ii. Spatial resolution
 - iii. GIS
 - iv. Induced polarization
 - v. Magnetic storm
- b) With the help of diagram, discuss the principles of remote sensing. [8 marks]
- c) Briefly discuss the difference between passive and active sensors. [4 marks]
- d) Discuss the differences between Geostationary orbits and Near-polar orbits in reference to remote sensing satellites. [4 marks]
- e) Discuss two major short coming of the seismic survey method. [4 marks]

Question Two

- a) Briefly discuss the operating principles of a gravity method during geological survey. [6 marks]
- b) Which five factors cause the gravitation acceleration to vary in different parts of the earth. [5 marks]
- c) Discuss the main applications of the gravity method in geological survey. [9 marks]

Question Three

- a) Briefly discuss the operating principle of magnetic method during geological survey. [6 marks]
- b) Briefly discuss the difference between Temporal resolution and Spectral resolution in relation to remote sensing devices. [4 marks]
- c) Discuss the two distinct techniques that are included under the thermal geological methods. [4 marks]
- d) List the stages involved in for remote sensing technology to function. [6 marks]

Question Four

- a) Discuss the basic operating principle of electrical methods as used in geological survey. [10 marks]
- b) Which corrections must be made to magnetic survey measurements in order to define a magnetic anomaly? [6 marks]
- c) Briefly differentiate between diamagnetism and paramagnetism. [4 marks]

Question Five

- a) What is remanent magnetization? [4 marks]
- b) What types of remanent magnetization are possible in: [6 marks]
 - i. Sedimentary
 - ii. Metamorphic
 - iii. Igneous rocks
- c) Discuss the current general applications of remote sensing technology. [10 marks]