

GEO369 – Introduction to Geophysics

28 September, 2004

Midterm: Due Oct. 5, no exceptions.

Each question is worth 20% of the total score. Credit is given for showing working (where applicable), neatness, and organization.

1. Geophysics from Space

Answer one of the following 2 questions:

- a. Explain the principles of satellite altimetry.
- b. Explain the principles of radar interferometry

2. Seismology and Earthquakes

Answer one of the following 3 questions:

- a. Interpret the following fault plane solution:



- b. Why is a magnitude 10 earthquake highly unlikely?
- c. Discuss and illustrate the two main types of surface wave.

3. Gravity

Answer one of the following 3 questions:

- a. What is the mass of the earth? Show your working and discuss problems with any assumptions that you make.
- b. Discuss the corrections that have to be made to raw gravity data to get the free-air anomaly and the Bouguer anomaly.
- c. Discuss how you might separate a regional and residual anomaly (in more detail than in the lecture notes).

4. Isostasy and large scale gravity

Answer one of the following 2 questions:

- a. What is the difference between the ellipsoid and the geoid?
- b. How might we determine if an area is in isostatic equilibrium?

5. Magnetism

Answer one of the following 2 questions:

- a. The “magnetic stripes” in the Atlantic can be modeled as adjacent N-S trending dykes of opposite polarity. Draw a representative E-W trending magnetic anomaly profile over these dykes at the magnetic equator.
- b. What are the corrections that have to be made to magnetic data before we can interpret an anomaly? How do we apply them?