

1. **Explain** (不僅是中翻英) the following geophysical terminologies (4%/EA)
 - (1) Seismogenic zone
 - (2) Bouguer anomaly
 - (3) Polar wandering
 - (4) Gutenberg-Richter relation (G-R law)
 - (5) PKJKP
2. Describe or illustrate the models of isostatic compensation proposed by **Airy** and **Pratt**. Compare the underlying assumptions of each model and explain their implications for understanding variations in topographic elevation. (15%)
3. How does the study of Earth's paleomagnetism provide evidence for the theory of plate tectonics, specifically in relation to seafloor spreading and apparent polar wander? (15%)
4. What variations in seismic velocity produce the triplication signature in a travel-time curve? Explain how this triplication arises and the major deep Earth structure it reflects. (15%)
5. What is the corner frequency in the context of the earthquake source spectrum? How is the corner frequency related to the size of an earthquake? (15%)
6. Define a seismogenic zone and explain its significance in earthquake generation. (10%)
7. Using the data provided in the table below, calculate the P-wave and S-wave velocities for olivine. (10%)

Elastic moduli for some common materials

Material	$k(\text{GPa})$	$\mu(\text{GPa})$	$\lambda(\text{GPa})$	ν	$\rho(\text{g/cm}^3)$
Water	2.1	0	2.1	0.50	1.0
Sandstone	17	6	13	0.34	1.9
Olivine	129	82	74	0.24	3.2
Perovskite	266	153	164	0.26	4.1

1 pascal = 10^{-5} bar
GPa = 10^9 pascal = 10^4 bar
1 dyne = $1 \text{ g} \cdot \text{cm} / \text{sec}^2$
1 bar = 10^6 [dyne / cm^2]
= 10^6 [g / ($\text{cm} \cdot \text{sec}^2$)]

試題隨卷繳回