

1. Distinguish among abyssal hills, seamounts, guyots, and island arcs.  
(15 分)
2. What are the chemical compositions of hydrogenous deposits of manganese nodules, phosphorite, glauconite, and carbonate ?  
In which environments do they form ? What is the relationship between a deposit's formation and its environment ?  
(15 分)
3. Diagram and discuss how Ekman transport produces the hill of water within major ocean gyres that causes geostrophic current flow.  
(15 分)
4. Describe a typical El Niño event and the effects they have on climate and ecosystems. (15 分)
5. Compare the biological productivity of polar, temperate, and tropical regions of the oceans. Include a discussion of seasonal variables, thermal stratification of the water column, and the availability of nutrients and solar radiation. (15 分)
6. Explain the following terms: (25 分)
  - a. Divergent plate boundary
  - b. Hydrothermal vent
  - c. Thermohaline circulation
  - d. Benthic nepheloid layer
  - e. Pycnocline

試題隨卷繳回