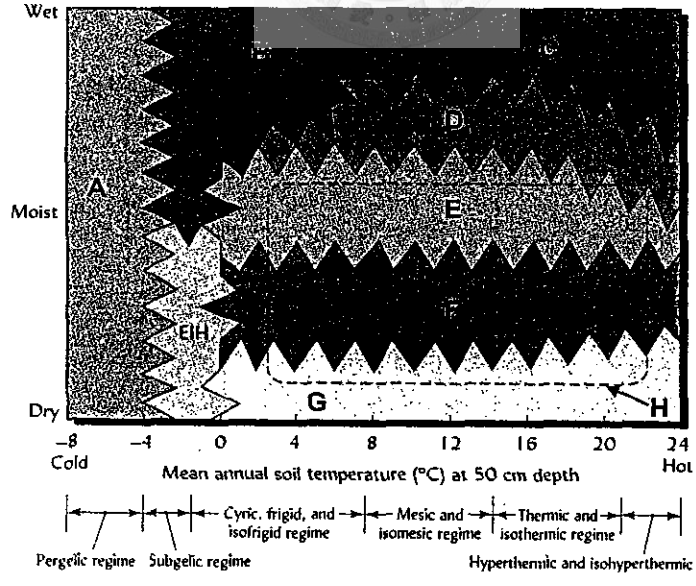
1. Give four reasons why compacting a soil is likely to reduce the amount of water available to growing plants. (10%)
2. Define the following terms respectively and give their SI units and/or other commonly used units:
   (a) electrical conductivity, (b) cation exchange capacity, (c) distribution coefficient, (d) sodium adsorption ratio, (e) soil water potential. (10%)
3. The amount of lime needed to increase the pH of high-organic-matter soils to target pH values in the 6.0 to 6.5 range is substantially higher than that required for low-organic soils. Generally, however, high-organic-matter soils are not limed to pH values greater than approximately 5.5. In answering the following, identify specific chemical processes or soil chemical characteristics to support your responses.
   (a) Why is the lime requirement of high-organic-matter soils generally greater than low-organic-matter soils?
   (b) Why are high-organic-matter soils only limed to achieve a pH of 5.5, instead of the 6.0 to 6.5 range that is standard for mineral soils? (10%)
4. A neighbor complained when his azaleas (杜鵑花) were adversely affected by a generous application of limestone to the lawn immediately surrounding the azaleas. To what do you ascribe this difficulty? How would you remedy it? (10%)
5. The following diagram showing the general soil moisture and soil temperature regimes that characterize the most extensive soils in each of eight soil orders, i.e., Alfisols, Aridisols, Gelisols, Mollisols, Oxisols, Spodosols, Ultisols, and Vertisols.
   (a) Assign these soil orders to the appropriate climate ranges respectively.
   (b) Rearrange these soil orders from the least to the most highly weathered.
   (c) Rearrange these soil orders in the order of increasing soil pH.
   (d) List those soil orders that are considered naturally fertile. (10%)



6. Describe the factors and practices influencing soil organic levels. (10%)
7. What are the dominant inorganic phosphorus forms and the inorganic phosphorus compounds commonly found in soils? (10%)
8. Describe and schematically draw the behaviors of organic chemicals in soils. (10%)
9. Describe the effects of intensified agriculture on soil quality. (10%)
10. Define the following terms:
    (a) humus, (b) greenhouse effect, (c) conservation tillage, (d) xenobiotics, (e)lithosequence. (10%)

試題隨卷繳回